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# The Effect of Mobile-Assisted Learning-Oriented Assessment on EFL Learners' Writing Ability

**Kobra Tavassoli***
*Department of Teaching English and Translation, Ka.C., Islamic Azad University, Karaj, Iran*
**Marjan Oskouiefar**
*Department of Teaching English and Translation, Ka.C., Islamic Azad University, Karaj, Iran*
**Masoumeh Ghamoushi**
*Department of Teaching English and Translation, Ka.C., Islamic Azad University, Karaj, Iran*

## Abstract

This study aimed to investigate the impact of mobile-assisted learning-oriented assessment (LOA) on the writing ability of English as a Foreign Language (EFL) learners. A total of 60 intermediate Iranian EFL learners were selected through convenience sampling and divided randomly into two groups: control and experimental. Both groups completed pretests and posttests, and the experimental group received nine 90-minute sessions focused on teaching descriptive essay writing using LOA syllabi and mobile applications related to the tasks. The control group followed a traditional writing syllabus without any LOA-related treatments. Both groups used the Adobe Connect mobile application for their online classes. Two open-ended questions were administered to the experimental group at the beginning and end of the course to measure their attitudes toward mobile-assisted language learning (MALL). The data were analyzed using a repeated-measures two-way ANOVA, revealing that mobile-assisted LOA significantly improved the EFL learners' writing ability. The results of the two open-ended questions indicated that the learners had a positive attitude toward MALL in general but a somewhat negative attitude toward online classes. The findings have important implications for teachers, materials developers, and teacher educators.

**Keywords:** EFL learners, Learning-oriented assessment (LOA), Mobile-assisted language learning (MALL), Writing

* *Corresponding author:* Department of Teaching English and Translation, Ka.C., Islamic Azad University, Karaj, Iran. *Email address:* kobra.tavassoli@kiau.ac.ir

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## 1. Introduction

As the global community's educational, business, and personal needs continue to grow, there is increasing recognition of the importance of second language proficiency in speaking and writing. However, among the four main language skills, writing is often identified as the most challenging for both students and teachers. This is particularly true for EFL learners, who frequently encounter difficulties in the writing process (Tavassoli & Rahmatollahi, 2023; Wale & Bogale, 2021; Zhang & Guo, 2012). Students often rely heavily on their existing linguistic knowledge rather than actively seeking new information or venturing beyond their comfort zone. To address this issue, teachers are expected to design tasks that not only motivate students to step out of their comfort zone but also provide them with sufficient background knowledge to successfully complete writing assignments, moving away from traditional instructional approaches (Yeh & Chen, 2019).

Moreover, although various instructional techniques have been implemented in writing instruction, the outcomes have not always been satisfactory. For instance, Communicative Language Teaching, a common methodology in the Iranian EFL education context where this study was conducted, has not significantly improved EFL learners' writing abilities (Estaji & Safari, 2023). This may be attributed to the cognitive nature of writing, indicating the necessity for an approach that addresses cognitive processes. One such approach is Learning Oriented Assessment (LOA), which integrates assessment with learning in the classroom, emphasizing the cognitive aspects of writing. To guide students through the learning process, language instructors must provide clear and practical feedback on writing tasks and other aspects of learning. Traditional writing tests have been widely used to provide feedback but are recognized as inadequate. Due to the shift toward learner-centered curricula and the importance of needs analysis, researchers have acknowledged the limitations of relying solely on standardized tests. Consequently, scholars have advocated for an alternative known as "assessment," leading to the emergence of Learning Oriented Assessment (LOA), an assessment-driven reform in language education (Farhady, 2020).

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Previous studies indicate that LOA can enhance the overall quality of foreign language classrooms and specifically improve learners' writing proficiency. It is suggested that LOA can be a suitable framework for enhancing learners' writing skills because it emphasizes active student engagement in the learning process, provides systematic feedback, and encourages opportunities for self-assessment (Yan & Carless, 2022). Following the significance of learner-centered curricula and needs analysis highlighted in the Learning Oriented Assessment (LOA) approach, educators continually seek reliable resources that effectively cater to the specific needs of their students. Notably, two primary perspectives on technology for language learning have emerged: a) technology as a means to provide valuable resources to teachers, and b) technology as an enhanced learning experience provider (Larsen-Freeman, 2004).

The impact of mobile technology on language learning and teaching has become increasingly evident in the modern era. Technology plays a crucial role in mobile-assisted language learning (MALL) by providing a platform for language learners to access educational resources, engage in interactive activities, receive feedback, and collaborate with peers and instructors (Hsu & Lin, 2022). The field of linguistics, including writing, has been revolutionized by technological advancements, fundamentally altering our understanding of how we write (Zhang, 2021). Mobile devices' portability is believed to enable new personalized learning styles and pedagogies, allowing learners to engage in learning on the go (Hashim et al., 2017). The use of mobile-assisted language learning (MALL) has become indispensable, particularly during the 2020 COVID-19 pandemic, which led to the suspension of in-person classes. As a result, educators and learners have been prompted to harness MALL as an essential tool, reflecting the growing importance of technology in addressing learner needs and promoting enhanced learning experiences.

Given the recognized effectiveness of LOA in addressing the cognitive aspects of writing and the increasing importance of MALL in language learning, the primary goal of this study was to investigate the potential of LOA in improving the writing skills of Iranian EFL learners. By exploring the impact of LOA on writing instruction, the study aimed to contribute valuable insights into the development of effective teaching methodologies that cater to students' needs. Additionally, the study sought to gather learners' perspectives on mobile-assisted writing instruction through an online writing course. This data could offer crucial input for needs analysis in writing courses, both online and in-person, facilitating the design of more targeted and impactful learning experiences. It was anticipated that the findings of this

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study would provide practical implications for educators and practitioners, enabling them to replace traditional writing exercises and tests with more meaningful tasks and assessments that offer learners accurate and valuable feedback. In doing so, this study has the potential to support the development of learner-centered writing curricula that enhance writing skills and promote a deeper understanding of the role of MALL in language education.

## 2. Literature Review

### *2.1. Learning-Oriented Assessment*

The approach of Learning-Oriented Assessment (LOA) was introduced by Purpura and Turner (2013) as a new perspective that aims to integrate teaching and assessment with a focus on learning. Jones and Saville (2016) considered LOA as a response to traditional assessment models, challenging the belief that such testing methods often distort education by prioritizing memorization and regurgitation of information from textbooks. Traditional testing, according to Purpura and Turner (2014), tends to neglect the practical application of knowledge. Consequently, the concept of assessment was reassessed through the lens of LOA, which emphasizes the practicality and application of knowledge in the learning process.

According to Keppell and Carless (2006), LOA stands out due to its broad applicability to various assessment practices, encompassing both summative and formative assessments, as long as the primary objective remains the promotion of student learning. It is important to highlight that although LOA shares similarities with further additional assessment techniques, such as diagnostic and dynamic evaluation, it should be regarded as distinct from them. LOA offers unique strengths and characteristics that differentiate it from these alternative approaches (Lantolf & Poehner, 2011).

The concept of LOA, as described by Carless (2015), encompasses three interconnected components: LOA tasks, the development of evaluative expertise, and student engagement with feedback. LOA tasks are specifically intended to encourage deep learning approaches and foster the achievement of effective learning results. The second component highlights the significance of nurturing students' evaluative expertise, enabling them to understand the criteria for quality performance and engage in self-assessment to enhance their own work. The final component highlights how students should actively engage with feedback, encouraging them to utilize it to improve their recent or upcoming assignments. The initial aspect of the assessment format directly contributes to the cultivation of evaluative skills and feedback-seeking behavior. Assessment designs like two-part assignments and

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draft-plus-rework facilitate multiple feedback cycles and enable learners to effectively incorporate feedback into their learning process (Winstone & Carless, 2020).

In LOA, assessment differs from norm-based assessment, where learners are evaluated in comparison to each other, and criterion-referenced assessment, which employs established criteria. Instead, LOA adopts a feedback-oriented approach that focuses on providing feedback and managing the workload of marking (Derakhshan & Ghiasvand, 2022). In the context of LOA, assessment results are provided to both learners and teachers after a few sessions within a module. This timely feedback facilitates a clear understanding of the expectations and requirements of the course. Teachers can utilize these assessments to identify the specific needs and areas requiring attention within the course. Simultaneously, learners can use the assessment feedback to better direct their efforts toward areas that require improvement or focused attention. This mutual engagement with assessment results supports a student-centered approach to learning and enables both learners and teachers to adapt their strategies and goals accordingly (Keppell et al., 2006).

In recent decades, several initiatives have been made to include LOA in language and general education curricula. To improve the general competency of EFL learners, for example, Keppell et al. (2006) offered empirical support for the use of LOA in technologically enhanced environments. Similarly, Hamp-Lyons (2017) focused on exploring the collaborative engagement between learners and instructors within the learning procedures. Specifically, the impacts of LOA on speaking assessment were investigated, indicating its potential utilization for enhancing speaking skills, particularly among teacher trainers.

Regarding the specific focus of the present study, previous research has also investigated the efficacy of LOA in the development of learners' writing abilities. For instance, Saygili (2021) carried out research to evaluate the pedagogical effect of LOA assignments on students' academic writing abilities in a Turkish setting. The results indicated that participants' writing proficiency significantly improved, as evidenced by better scores on their writing tasks. Though the participants initially found the process challenging, they later acknowledged the substantial opportunities provided by LOA for monitoring and controlling their learning process.

Likewise, to investigate how learning-oriented online assessment is considered to affect L2 students' feedback literacy and individual variations in feedback literacy development, Ma et al. (2021) undertook a study. The findings showed that although students thought less favorably of online learning

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as a means of fostering feedback literacy, they did see improvements in areas like valuing feedback, forming opinions, and acting upon it. There were notable differences in the focal students' development of feedback literacy, especially when it came to controlling affective responses and acting. The results demonstrated the detrimental effects of misaligning micro- and macro-factors on student feedback literacy as well as how this discrepancy is combined with learner factors to affect the feedback literacy of specific students during the application of learning-oriented assessment (LOA) in the COVID-19 context. Similarly, Jalilzadeh and Yeganehpour (2021) examined the beliefs of Iranian EFL teachers regarding LOA in the context of the COVID-19 outbreak. The findings revealed that Iranian teachers preferred LOA as a method to evaluate their learners. A significant number of participants expressed their belief in the effectiveness and feasibility of LOA for evaluating students' writing skills.

In addition, to find out how LOA affected the opinions and argumentative writing abilities of impulsive versus reflective learners, Estaji and Safari (2023) carried out a study. The results showed that the pupils' writing performance was much enhanced by the application of LOA. It is interesting to see that reflective learners outperformed impulsive learners in writing at the end of the treatment, despite the type of writing challenge having no discernible impact. The findings also showed that learners' opinions on applying the LOA technique were, for the most part, favorable. They were especially appreciative of the ways that peer evaluation, teacher comments, and class discussions helped them improve their writing throughout the semester. Notably, reflective learners exhibited greater appreciation for the tasks in terms of developing competence and demanding critical thinking. Based on these findings, it can be concluded that LOA can effectively be employed as a learning approach to enhance the writing performance and overall landscape of Iranian EFL learners.

Moreover, Jalilzadeh and Coombe (2023) conducted a study to investigate the barriers that impede the practice of LOA in EFL classrooms. The findings suggest that prior to implementing LOA principles in their classes, teachers need to prioritize coordination among the various components of the curriculum. Establishing effective coordination is seen as a necessary step to overcome the identified constraints.

### *2.2. Mobile-Assisted Writing Instruction*

Mobile-Assisted Language Learning (MALL) is a subset of technology-enhanced learning that can be implemented in various formats, including face-to-face, distance, or online modes (Baleghizadeh & Oladrostam, 2010). Uwizeyimana (2018) described MALL as the utilization of mobile devices and

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wireless technology for language learning, as it enables users to access content and information from around the world, facilitating skill enhancement. Şad et al. (2022) defined MALL as an approach that emphasizes the use of flexible and accessible language learning tools. Kukulska-Hulme and Shield (2008) regarded MALL as a pedagogical method that employs technological tools to facilitate interactions among students. Additionally, MALL refers to the teaching and learning process that can take place anytime and anywhere with the assistance of handheld mobile technologies (Khubyari & Narafshan, 2016).

Several studies focusing on MALL in the context of teaching writing skills have yielded encouraging findings for ESL/EFL learners. For instance, Al-Saleem (2013) conducted research involving the use of electronic journaling through WhatsApp to enhance the writing skills of EFL undergraduate students in Saudi Arabia. The results indicated that students demonstrated proficiency in engaging in discussions and reported enjoyment in their dialogue journaling activities. Furthermore, the findings revealed improvements in vocabulary usage and the development of ideas among the students. In a similar vein, Al-Hamad et al. (2019) conducted research to investigate the impact of MALL on the development of writing skills among teenage students. The study findings demonstrated significant improvements across various aspects of writing, including content and ideas, organization, mechanics, vocabulary, and word choice. Similarly, Jassim and Dzakiria (2019) conducted a study on Arab EFL students and found that the use of mobile phones had positive effects on student writing skills, particularly in terms of content and structure. The results strongly suggest that mobile phones play a motivating role in the teaching of writing and facilitate the enhancement of writing skills. Al-Shehab (2020) also conducted a study to examine the impact of mobile-assisted language learning on the writing skills of students at Kuwait University. The research involved forty participants who utilized various mobile applications and websites, including Microsoft Word, English dictionary apps, and internet search engines. The findings indicate that smartphones served as an effective teaching tool, positively affecting student agency. Similarly, Pingmuang and Koraneekij (2022) conducted a study focusing on MALL using a task-based approach and gamification in order to enhance the writing skills of EFL students. The research findings revealed several key points. Firstly, lower secondary students exhibited regular internet usage and expressed a desire to learn practical writing skills based on their own experiences. This included studying writing errors, writing samples, writing styles, engaging in peer assessment, and receiving constructive feedback from teachers. The experimental results indicated that the post-test

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scores of the samples' English writing skills were significantly higher than the pre-test scores. Statistical analysis also demonstrated a significant difference in mean scores for the English writing tasks. Furthermore, the satisfaction assessment demonstrated that the participants expressed high satisfaction with the learning process and the MALL application.

The existing literature review reveals a growing research interest in the effects of mobile-assisted writing instruction. However, to date, there is a lack of empirical studies investigating the potential impact of mobile-assisted learning-oriented assessment on Iranian EFL learners' writing ability and their attitudes toward it. In light of these research gaps, the current study aims to address this dearth of knowledge by exploring the following research questions:

1. Does mobile-assisted learning-oriented assessment (LOA) have any significant impact on EFL learners' writing ability?
2. What are the EFL learners' attitudes toward mobile-assisted language learning (MALL)?

## 3. Method

### *3.1. Participants*

The study involved 60 Iranian EFL learners, both male and female, ranging in age from 18 to 30. To ensure that they all met the required proficiency level, the participants took the Oxford Placement Test. The technique employed for participant selection in this research was convenience sampling (Best & Kahn, 2006), where participants who were readily available and willing were included in this study. The participants were then randomly divided into two groups, Experimental and Control, with 30 students in each group. Additionally, each group was further divided into four classes throughout the course. Most of the participants expressed a strong interest in attending the classes, as they either had no previous experience in essay writing or had only studied it through self-study. The course was seen as a suitable starting point for improving their writing skills. There were no limitations placed on the participants' location as the research was conducted online using the Adobe Connect platform, which is based on the principles of Mobile-Assisted Learning.

### *3.2. Instruments*

#### *3.2.1. The Proficiency Test*

The researchers of the present study utilized the Oxford Placement Test (OPT) to homogenize the participants. It includes 60 questions testing the students' vocabulary, grammar, and reading

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comprehension. The researchers could understand the four stages of functioning that the participants were operating at elementary, pre-intermediate, intermediate, and advanced. The respondents who had scores that fell between one standard deviation above and below the mean were identified as the intermediate and constituted the target sample for the research based on the results.

### *3.2.2. The Writing Pretest and Posttest*

At the beginning and end of the research, both a pre-test and a post-test were administered using the Adobe Connect online platform. During the second session, which was attended by both the experimental and control groups, the students were instructed to write an essay describing their dream home. In the last session, the students were again required to write a descriptive essay about their dream home. Both the pre-test and the post-test consisted of one task, and the allocated time for each test was approximately 80 minutes. The tests were conducted online through the Adobe Connect platform, with the teacher present and available throughout the entire exam session. To submit their responses, the students were instructed to type their answers in a Word file and send it to their class groups on Telegram.

### *3.2.3. The Adobe Connect and Telegram Platforms*

To facilitate online sessions, the researchers utilized the Adobe Connect platform, which is a mobile-friendly application commonly used for online classrooms, webinars, conferences, and similar purposes. For communication and provision of post-class materials, the researchers opted for the Telegram application. A Telegram channel was created for general announcements related to the classes, with both experimental and control group members joining. Additionally, eight individual Telegram groups were established, four for the experimental groups and four for the control groups. These groups served as platforms for participants to submit their homework and pose questions. Within the experimental group, each class's Telegram group had an additional purpose. The students were encouraged to search for reliable sources, such as the British Council and Cambridge websites on Google and YouTube, to gather additional information related to the lessons taught during each session. Once the information was approved by the instructor, students would share it with their respective Telegram groups.

### *3.2.4. Open-Ended Questions on EFL Learners' Attitude Toward MALL*

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During the first and last sessions of the course, two open-ended questions were administered to the experimental group using Google Forms to explore the participants' attitudes toward MALL. Rather than physical copies of the questions which were not suitable for this research, the instructor used Google Forms with an online version of the questions. The aim was to gather data regarding the learners' attitudes toward MALL.

### *3.3. Procedure*

In this study, a quasi-experimental design was used because true randomization was not possible. After the learners underwent the Oxford Placement Test and were assigned to either the experimental or control group, they were provided with a timetable outlining the schedule of the sessions and the subjects they would be learning. The essay prompts and contents were derived from sources such as the British Council-Literacy and Cambridge practice books.

Data collection took place throughout nine sessions, spanning approximately five weeks. Two sessions were held per week, except for the final week. Each session had a duration of 90 minutes. The learners' interest in joining the course was primarily driven by their limited experience in essay writing and their intention to take future standard exams. As a result, they found the course to be of interest and relevance to their goals. Moreover, in this study, teachers' expertise in mobile-assisted language-oriented assessment was taken into account. The selected teacher who was one of the researchers of the current study had experience integrating mobile devices in their assessment practices and was proficient in using mobile apps for language-oriented assessment.

Notably, since the course was learning-oriented, minor adjustments were made to the lesson plan for the experimental group based on the teacher's monitoring results. Additionally, the experimental group was encouraged to use their mobile devices more frequently for the learning process, conducting searches for additional information related to each session's topic. The learners would explore vocabulary resources, reliable online dictionaries, and even YouTube videos offering extra hints about the lessons they had learned. Moreover, during the course, students took on the responsibility of evaluating their writing and essays through self-assessment and peer assessment. Each session involved the course instructor giving feedback, which varied from implicit to delayed, and could be either oral or written. The feedback was tailored based on the writing issues identified in the students' work, such as unclear rubrics. Furthermore, the role of the instructor was to monitor the information and activities shared by

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the learners within their teams, while also providing additional videos and information regarding their homework.

When designing the course syllabus, Bloom's taxonomy (1956) was considered, as it aligns well with learning-oriented assessment (LOA) instructions. Bloom's taxonomy consists of the following steps: remembering, understanding, applying, analyzing, evaluating, and creating. The three important branches of LOA — assessment tasks as learning tasks, students' engagement in assessment, and the feedback loop — were also adhered.

Regarding the writing process, the learners were taught the four main stages of writing, as introduced by Harmer (2012): planning, drafting, revising, and editing. While the writing process was the same for both the experimental and control groups, the instructor guided the participants through each level of the writing process in class. For instance, if the topic was how to describe a candy store, the instructor would initially ask the learners to individually or collectively brainstorm and come up with keywords related to the subject. This brainstorming session would continue until the learners were satisfied with the information they had about the subject. The instructor would then guide the learners through each step of the writing process and occasionally remind them to revise what they had already written.

To provide corrections and feedback to the participants, the Open Lab at BMCC's Descriptive Essay Rubric was utilized. The rubric comprises six sections: introduction, sensory detail, word choice, simile/metaphor/personification, sentence structure, and grammar. Each section had a maximum score of 4, resulting in a total score of 24.

## 4. Results

### *4.1. Investigating the Impact of Mobile-assisted Learning-oriented Assessment (LOA) on EFL Learners' Writing Ability*

To answer the first research question of the present inquiry, the data was analyzed through parametric formulae since all the pretest and posttest data sets were normally distributed. The normality of the data in the proficiency test as well as the pretest and posttest was checked through a One-sample Kolmogorov-Smirnov test where all the significance values were above .05, indicating that the data sets were normally distributed. To check whether or not mobile-assisted learning-oriented assessment has any noteworthy effect on EFL learners' writing ability, a repeated-measures two-way ANOVA was run since, according

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to Hinton et al. (2014), it is the most appropriate formula in such designs. The formula is suitable for analyzing the data where there is one dependent variable (i.e., writing ability in the case of this research) which is repeatedly measured in two groups (i.e., the experimental and control groups). The point to be noted is that in all the analyses run on the writing pretests and posttests, the mean scores of the two raters were used.

First, Table 1 demonstrates the descriptive statistics of the writing scores in the pretest and posttest of the control and experimental groups.

**Table 1**

*Descriptive Statistics of the Pretest and Posttest Scores of the Two Groups*

| | | Pretest | Posttest |
|---|---|---|---|
| Control Group (N=30) | Mean | 16.60 | 17.56 |
| | SD | 2.46 | 2.24 |
| Experimental Group (N=30) | Mean | 15.41 | 18.45 |
| | SD | 2.58 | 2.65 |

According to Table 1, the mean scores reported for the writing pretest and posttest of the control group are 16.60 and 17.56. That is, the participants had a better performance in their posttest. The same point is true about the writing pretest and posttest of the experimental group since their mean score changed from 15.41 to 18.45, which is a sign of the improvement of the participants of this group from the start to the end of the research.

Moreover, the two groups' performance in either their pretest and/or posttest can be checked to find out which group progressed more. Checking the mean scores of the two groups' performance in the pretest, which are 16.60 for CG and 15.41 for EG, the conclusion is that the control group had a slightly better performance in the pretest. Comparing the pretest mean scores of the two groups with that of the posttests, that is, 17.56 for CG and 18.45 for EG, a good amount of improvement is observed in both groups' performance. In addition, the amount of the experimental group's development is higher since although obtaining a lower mean score on the pretest, the participants of this group had a fairly higher mean score on their posttest (15.41 on the pretest and 18.45 on the posttest).

**Table 2**

*Tests of within and between Subjects Effects of the Pretest and Posttest of the two Groups*

| Effect | | Value | F | Sig. | Partial Eta Squared |
|---|---|---|---|---|---|
| Time | Pillai's Trace | .53 | 59.57 | .00* | .53 |

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| | | | | | |
|---|---|---|---|---|---|
| Group | | | .05 | .81 | .00 |
| Time * Group | Pillai's Trace | .24 | 16.14 | .00* | .24 |

However, to decide the significance of the amount of their improvement as well as the difference between the two groups' progress, the outcomes of a repeated-measures two-way ANOVA are presented in Tables 2 and 3, and Figure 1.

The first row in Table 2, named 'time', illustrates within-subjects factor information, which refers to the interval between the pretest and posttest of the writing of the two groups, the significance value for which is .00 ($p$=.00; $\alpha$=.05; $p<\alpha$). Since the value is smaller than the critical .05 level, the conclusion is that there is a significant difference between the participants of the two groups' performance from the pretest to the posttest. The size of this effect is large as the value of the partial eta squared is .53 and referring to Pallant (2020), the partial eta squared value is small if it is .01 or 1%, moderate if it is .06 or 6%, and it is considered large if it is .138 or 13.8%.

The second row, named 'group', is devoted to reporting the upshots of the effect of between-subjects effects. The significance value of this factor is .81 which is above the critical value ($p$=.81; $\alpha$=.05; $p>\alpha$) meaning that the performance of the two groups was not different from each other on either the pretest or the posttest. The size of this effect is small because of its partial eta squared value, which is .00.

The third row in Table 2, named 'time*group', reports the most important piece of information. The significance value of the interaction between time and group is .00 and smaller than the critical .05 level, meaning that here again there is a considerable difference between the performance of the two groups from the pretest to the posttest but the amount of this difference is not the same. That is to say, the control and experimental groups did not have the same extent of improvement from the pretest to the posttest. The effect size of this interaction is large with reference to its partial eta squared value, that is .24.

**Table 3**

*Pairwise Comparisons on the Posttests of the Two Groups*

| (I) Grouping | (J) Grouping | Mean Difference (I-J) | Std. Error | Sig. |
|---|---|---|---|---|
| Control Group | Experimental Group | .15 | .64 | .81 |

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According to the results of Tables 1 and 2, it can be concluded that the writing ability of the participants of the control and experimental groups improved significantly from the pretest to the posttest. However, the experimental group had more progress from pretest to posttest.

The results of Table 3 provide enough information to show that the control group and the experimental group did not perform differently from each other on the post-test since the significant value reported for comparing their performance is .81, which is higher than the critical value of .05 ($p$=.81; $\alpha$=.05; $p>\alpha$).

Putting the results of Tables 1, 2, and 3 together, the conclusion is that the performance of the participants of the two groups improved significantly from the pretest to the posttest, and the experimental group had a considerably better amount of progress from the beginning to the end of the semester.

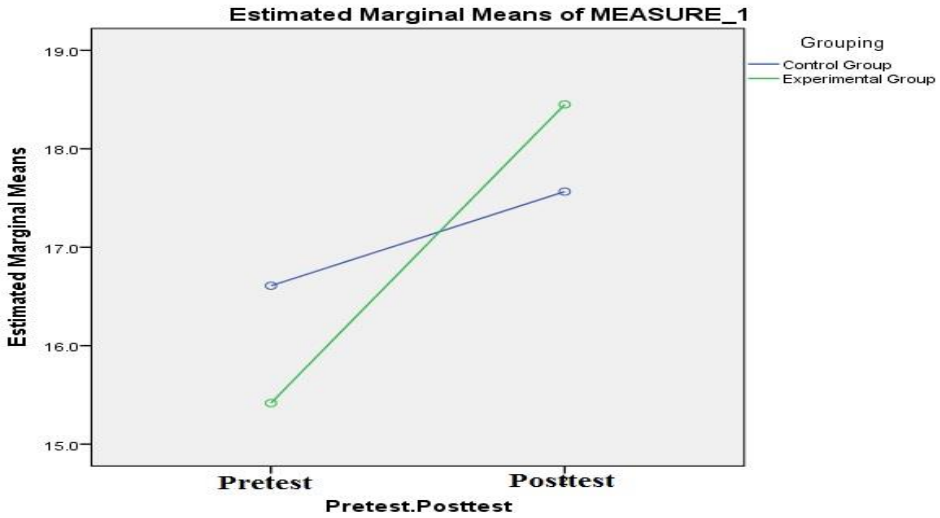
Figure 1 presents an image of what has been said about the differences between the performance of the two groups on writing from the pretest to the posttest. The steeper line in Figure 1 indicates the experimental groups and the smoother line shows the control group's performance on the pretest and posttest. The point is that the two groups had a good amount of improvement from pretest to posttest. In addition, it can be seen that although the experimental group performed poorer in the pretest, it performed better on the posttest which would be the reason why the amount of the experimental group's progress was significantly better on the whole. Therefore, it can be claimed that the outcomes of Tables 1, 2, and 3 are reconfirmed, meaning that mobile-assisted learning-oriented assessment (LOA) has a significant impact on EFL learners' writing ability.

**Figure 1**

*Differences between the Writing Pretest and Posttest of the two Groups*

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### *4.2. Investigating EFL learners' Attitudes toward Mobile-assisted Language Learning (MALL)*

The second research question, concentrating on the EFL learners' attitudes toward MALL, was investigated through two open-ended questions asked of the participants at the beginning and end of the study. The answers to these questions were then transferred to NVivo software version 11 to be analyzed. To do so, all the answers related to each of the two administrations of the questions were imported to separate NVivo files and categorized according to the ideas provided by the learners.

All the files were then analyzed meticulously to find out the frequency with which different ideas/opinions were presented. The results obtained through this phase were then reported in the form of the frequency of each node (idea) and its corresponding percentage in Table 6.

**Table 6**

*The Frequency of Ideas Learners Presented Regarding the Use of Mobile Devices for Learning Purposes Inside the Class*

| What do you think of using mobile devices for learning purposes inside the class? | | |
|---|---|---|
| | Pre-instruction | Post-instruction |
| Beneficial | 23 (82.14%) | 36 (85.71%) |
| Helpful if controlled | 1 (3.57%) | 1 (2.38%) |
| Not good | 1 (3.57%) | 5 (11.90%) |
| Other devices are better | 3 (10.71%) | 0 |

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Table 6 illustrates the frequency at which students announced their ideas regarding the use of mobile devices for learning purposes inside the class both at the start and at the end of the investigation. Going into the details, it becomes clear that most of the learners believed such devices were beneficial at the start of the study (82.14%). Statements such as *"It's mostly helpful. It's gonna be useful. It's good. It's useful. Mobile devices can make everything easier and faster, and also build confidence."* are some of the ideas in favor of mobile devices. The learners had even more positive viewpoints toward using mobile devices in class (85.71%) at the end of the research.

On the contrary, only 3.57% of the statements made by the learners at the beginning of the investigation were that mobile devices are only helpful if they are controlled which decreased to 2.38% at the end. Moreover, while only 3.57% of the students said the devices were not good at the start, 11.90% said so at the end of the inquiry. The other 10.71% of the opinions at the beginning of the study were related to the point that other devices or ways of teaching and learning such as laptops and/or traditional classes are more useful, whereas this number changed to 0 at the end of the study.

Putting the results of the answers to this item together, it can be stated that at the end of the research, more positive viewpoints were seen toward using mobile devices for learning purposes inside the class which can be the outcome of the instructions they received throughout the study and also their actual use of mobile devices that made them believe in the usefulness of technology for teaching and learning purposes.

**Table 7**

*The Frequency of Ideas Learners Presented Regarding Online Classes*

| What do you think of online classrooms? | | |
|---|---|---|
| | Pre-instruction | Post-instruction |
| Beneficial | 44 (84.61%) | 35 (72.91%) |
| Not good | 8 (15.38%) | 12 (25%) |
| The same | 0 | 1 (2.08%) |

Table 7 reports the learners' ideas about the online classes at both the pre-and post-instruction administrations of the questions. According to this table, 84.61% of the ideas were in favor of online classrooms at the start of the research while 72.91% of the viewpoints were in favor of such classes at the end. Some examples that referred to the classes as beneficial included: *"I prefer online classroom.*

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*It's good for me. I can attend the class wherever I am. It helped me to reach tutors that I could never access in real life. I think they are very helpful"*.

On the other hand, according to 15.38% of the ideas, such as, "*Communication is hard in them since there is not any physical interaction in some classes. Connection problems are annoying. Focusing on tasks is difficult. The fact that you can't feel the presence of everyone is a downside of online classes."*, online classes were not good at the start of the research while 25% had such opinions about online classes at the end of the study. Interestingly, at the beginning of the study, no one mentioned there were no differences between traditional and online classes, but there was one idea (i.e., 2.08%) stating this at the end of the study.

Eventually, it could be concluded that from the beginning to the end of the study, the number of those in favor of online classes decreased to some extent which can be due to the problems they had in connecting to the classes and therefore, having to spend more time watching or listening to the classes afterward.

## 5. Discussion

The present study investigated the effect of mobile-assisted LOA on EFL learners' writing ability. Two homogeneous groups of EFL learners (experimental group, N=30, and control group, N=30) joined a pre-designed writing course. The quantitative analysis of the collected data showed that mobile-assisted LOA had a significant impact on EFL learners' writing ability. Both the experimental and control groups showed significant improvement in their writing abilities by the end of the course. However, the experimental group, which received the treatment of mobile-assisted LOA, showed more progress compared to the control group. The participants demonstrated improved proficiency in organizing their ideas, employing appropriate vocabulary, and adhering to grammatical conventions. This is consistent with Saygili's (2021) findings that emphasized the benefits of LOA in fostering EFL learners' writing development. Moreover, the participants in the current study also exhibited an increased ability to assess their own writing which corresponds with the findings of Ma et al. (2021) regarding the positive influence of LOA on students' capacity to interpret and apply feedback. This observation further supports the assertion that LOA not only improves learners' writing ability but also enhances their self-regulatory skills. The outcomes of the present study also align with those of Estaji and Safari (2023), highlighting the efficacy of LOA in improving both impulsive and reflective learners' argumentative writing

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performance, despite their differences in cognitive styles. Therefore, the results of the present study corroborate the growing body of evidence demonstrating the effectiveness of LOA in fostering EFL learners' writing development, as corroborated by previous studies

The outcomes of the current study substantiate the findings of previous research concerning the impact of mobile-assisted writing instruction on the development of EFL learners' writing abilities. For instance, the present study's findings align with Al-Saleem's (2013) investigation, which focused on the utilization of electronic journaling via WhatsApp to enhance the writing skills of EFL undergraduate students in Saudi Arabia. The outcomes demonstrated students' adeptness in engaging in discussions and their enjoyment of dialogue journaling activities. Noticeable improvements were observed in vocabulary usage and idea development, which are consistent with the current study's findings. Similarly, the outcomes of this study are in agreement with the results reported by Al-Hamad et al. (2019), who examined the influence of Mobile-Assisted Language Learning (MALL) on the development of writing skills among adolescent learners. They discovered significant advancements across various dimensions of writing, encompassing content, organization, mechanics, vocabulary, and word choice, which corroborates the present study's findings. Likewise, Jassim and Dzakiria's (2019) exploration of the effects of mobile phone integration in MALL on the writing skills of Arab EFL students is also congruent with the outcomes of this study. They found positive outcomes in terms of content and structure, indicating that mobile phones can act as motivational tools for teaching writing and facilitate the refinement of writing abilities among EFL learners. Moreover, Al-Shehab (2020) reported that smartphones served as effective pedagogical tools with a positive influence on student agency and writing skills lends further support to the present study's findings. Both studies highlight the efficacy of mobile devices in promoting writing proficiency. In addition, the outcomes of the current study correspond with the findings of Pingmuang and Koraneekij (2022), who focused on MALL implementation using a task-based approach and gamification to enhance the writing skills of EFL students. The significant improvements in post-test scores for English writing skills and participants' high levels of satisfaction with the learning process and the MALL application are in line with the positive results obtained in the present study.

Considering the second research question pertaining to learners' attitudes toward MALL, the findings of the current study reveal an overall favorable disposition among participants regarding the utilization of mobile devices for educational purposes. Nevertheless, it is important to highlight that this positive attitude was not evident when it came to their perceptions of online classes. These findings are

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consistent with the observations presented by Klimova (2020), who pointed out that mobile applications intended for language learning often prioritize the enhancement of vocabulary, given the limited screen size of mobile devices, which is more conducive to the display of words and phrases. The results of this study align with the findings of Saidouni and Bahloul (2016), who also reported a positive attitude toward MALL among both teachers and students. However, it is worth noting that some teachers expressed the belief that their instructional materials and contextual factors necessitated further refinement and improvement to be effectively integrated into MALL.

## 6. Conclusion

The primary aim of this study was to examine the potential impact of mobile-assisted learning-oriented assessment on students' writing proficiency. Although both the experimental and control groups demonstrated improvement over the duration of the course, the experimental group exhibited more substantial and statistically significant improvement compared to the control group. Additionally, the experimental group's attitudes toward MALL exhibited a positive shift by the conclusion of the study, suggesting that the treatment received by the experimental group throughout the semester influenced their perception of mobile-assisted writing. The findings of the present study revealed a modestly positive inclination among participants toward the utilization of mobile devices for educational purposes. However, it is noteworthy that this positive attitude was not consistently observed in the learners' perspectives on online classes.

The findings of this study have important implications for EFL teachers, materials developers, and teacher educators, highlighting the potential of mobile-assisted LOA in enhancing EFL learners' writing ability. For EFL teachers, it is recommended to integrate mobile-assisted LOA into their writing instruction. They can make use of mobile devices and associated applications to supplement writing practice, provide personalized feedback, and create self-assessment opportunities for learners. Exploring and adapting suitable mobile tools and strategies is key to effectively enhancing students' writing proficiency.

Materials developers should consider the criticality of selecting flexible learning tools, particularly in the context of online or mobile-assisted classes. They should ensure a stable internet connection, address potential limitations, choose user-friendly applications, deliver content relevant to the learners' goals, and provide guidance on the independent use of mobile applications for effective

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learning progress. Moreover, the implementation of LOA in syllabi can significantly enhance learners' writing ability by addressing their specific needs throughout the course, offering timely feedback at both class and individual levels, and enhancing learner engagement during the assessment process.

Teacher educators play a crucial role in training EFL teachers to incorporate mobile-assisted learning into their writing instruction. They can offer professional development programs focusing on the proficient utilization of mobile technologies, specific pedagogical approaches for mobile-assisted writing instruction, and effective assessment techniques. Equipping teachers with the necessary skills is part of their professional development (Farhady & Tavassoli, 2015, 2021) and empowers them to harness the potential of MALL in their educational settings.

It is also important to acknowledge several limitations of this study. First, the study had a relatively short duration and a limited sample size, which could limit the generalizability of the findings. A longer duration and a larger sample would have provided a more comprehensive understanding of the impact of mobile-assisted LOA on EFL learners' writing ability. Second, the findings may not be readily applicable to other populations or proficiency levels due to the specific characteristics of the participants and the study context. The study focused on intermediate-level Iranian EFL students with no prior essay writing experience, so caution should be exercised when extrapolating the results to different groups. Another limitation is related to the specific mobile-assisted learning tools and applications used in the study. The effectiveness of other mobile platforms or applications may differ, and different tools might produce different outcomes. Future research should explore a wider range of mobile-assisted learning tools to gain a more comprehensive understanding of their impact. Furthermore, the study primarily focused on the writing ability and may not have captured all dimensions of writing proficiency. Incorporating a broader set of assessment measures in future research would provide a more holistic view of the learners' writing skills. Lastly, the study did not extensively investigate the role of teachers in implementing mobile-assisted LOA. Further examination of teachers' knowledge, attitudes, and instructional practices regarding mobile-assisted learning and assessment would provide valuable insights into the factors influencing language learning.

**References**

Al-Hamad, R. F., Al-Jamal, D. A., & Bataineh, R. F. (2019). The effect of MALL instruction on teens' writing performance. *Digital Education Review, 35,* 289-298.

[ Downloaded from c4i2016.khu.ac.ir on 2026-10-31 ]

[ DOR: 20.1001.1.17351634.2023.26.2.12.9 ]

Al-Saleem, B. I. A. (2013). The effect of "WhatsApp" electronic dialogue journaling on improving writing vocabulary word choice and voice of EFL undergraduate Saudi students. *Arab World English Journal*, *4*(3), 213-225.

Al-Shehab, M. (2020). The role of mobile-assisted language learning (MALL) in enhancing the writing skills of intermediate IEP students: Expectations vs Reality. *Language Teaching Research Quarterly*, *20*, 1-18.

Baleghizadeh, S., & Oladrostam, E. (2010). The effect of mobile assisted language learning (MALL) on grammatical accuracy of EFL students. *Mextesol Journal*, *34*(2), 1-10.

Best, J. W., & Kahn, J. V. (2006). *Research in education*. Pearson Education.

Bloom, B., & Krathwohl, D. R. (1956). *Taxonomy of educational objectives: The classification of educational goals, by a committee of college and university examiners*. Handbook 1: Cognitive domain. Longmans.

Carless, D. (2015). Exploring learning-oriented assessment processes. *Higher Education, 69*(6), 963–976. https://doi.org/10.1007/s10734-014-9816-z

Derakhshan, A., & Ghiasvand, F. (2022). Demystifying Iranian EFL teachers' perceptions and practices of learning-oriented assessment (LOA): Challenges and prospects in focus. *Language Testing in Asia*, *12*(1), 55. https://doi.org/10.1186/s40468-022-00204-2

Estaji, M., & Safari, F. (2023). Learning-oriented assessment and its effects on the perceptions and argumentative writing performance of impulsive Vs. reflective learners. *Language Testing in Asia*, *13*(1), 31. https://doi.org/10.1186/s40468-023-00248-y

Farhady, H. (2020). *EFL teacher's language assessment knowledge: An urgent necessity*. Speech presented at A Webinar for ITTC in Turkey, Istanbul.

Farhady, H., & Tavassoli, K. (2015). *EFL teachers' professional knowledge of assessment*. Paper presented at the 37th international LTRC conference on From Language Testing to Language Assessment: Connecting Teaching, Learning, and Assessment (March, 18-20). Toronto, Canada.

Farhady, H., & Tavassoli, K. (2021). EFL teachers' perceptions and practices of their language assessment knowledge. *Language Testing in Asia*, *11*, Article 17, 1-19. https://doi.org/10.1186/s40468-021-00135-4.

Hamp-Lyons, L. (2017). Language assessment literacy for learning-oriented language assessment. *Papers in Language Testing and Assessment, 6*(1), 88–111.

[ Downloaded from c4i2016.khu.ac.ir on 2026-10-31 ]

[ DOR: 20.1001.1.17351634.2023.26.2.12.9 ]

Harmer, J. (2012). *Essential teacher knowledge*. Pearson Longman.

Hashim, H., Yunus, M. M., Embi, M. A., & Ozir, N. A. M. (2017). Mobile-assisted language learning (MALL) for ESL learners: A review of affordances and constraints. *Sains Humanika, 9*, 1-5. https://doi.org/10.11113/sh.v9n1-5.1175

Hinton, P. R., McMurray, I., & Brownlow, C. (2014). *SPSS explained.* Routledge.

Hsu, H. T., & Lin, C. C. (2022). Extending the technology acceptance model of college learners' mobile-assisted language learning by incorporating psychological constructs. *British Journal of Educational Technology*, *53*(2), 286-306. https://doi.org/10.1111/bjet.13165

Jalilzadeh, K., & Coombe, C. (2023). Constraints in employing learning-oriented assessment in EFL classrooms: teachers' perceptions. *Language Testing in Asia, 13*(1), 1–16. https://doi.org/10.1186/s40468-023-00222-8

Jalilzadeh, K., & Yeganehpour, P. (2021). The relationship between intermediate EFL students' oral performance, communicative willingness, as well as emotional intelligence. *The Reading Matrix: An International Online Journal*, 21(2), 29–48. https://doi.org/10.1186/s40468-023-00222-8

Jassim, L. L., & Dzakiria, H. (2019). The effect of utilizing mobile on developing English writing skill. *Opción*, *34*(19), 2128-21437.

Jones, N., & Saville, N. (2016). *Learning oriented assessment*. Cambridge University Press.

Keppell, M., Au, E., Ma, A., & Chan, C. (2006). Peer learning and learning-oriented assessment in technology-enhanced environments. *Assessment and Evaluation in Higher Education, 31*(4), 453–464. https://doi.org/10.1080/0260293060 0679159

Keppell, M., & Carless, D. (2006). Learning-oriented assessment: A technology-based case study. *Assessment in Education: Principles, Policy & Practice, 13*(2), 179–191. https://doi.org/10.1080/09695940600703944.

Khubyari, L., & Narafshan, M. H. (2016). A study on the impact of MALL (Mobile Assisted Language Learning) on EFL learners' reading comprehension. *International Journal of English Language Teaching*, *4*(2), 58-69.

Klimova, B. (2020). Benefits of the use of mobile applications for learning a foreign language by elderly population. *Procedia Computer Science, 176*, 2184-2191. https://doi.org/10.1016/j.procs.2020.09.255.

[ Downloaded from c4i2016.khu.ac.ir on 2026-10-31 ]

[ DOR: 20.1001.1.17351634.2023.26.2.12.9 ]

Kukulska-Hulme, A., & Shield, L. (2008). An overview of mobile assisted language learning: From content delivery to supported collaboration and interaction. *ReCALL*, *20*(3), 271-289. https://doi.org/10.1017/S0958344008000335

Lantolf, J. P., & Poehner, M. E. (2011). Dynamic assessment in the classroom: Vygotskian praxis for second language development. *Language Teaching Research, 15*(1), 11–33. https://doi.org/10.1177/1362168810383328

Larsen-Freeman, D. (2004). *Techniques and principles in language teaching*. Oxford University Press.

Ma, M., Wang, C., & Teng, M. F. (2021). Using learning-oriented online assessment to foster students' feedback literacy in L2 writing during COVID-19 pandemic: A case of misalignment between micro-and macro-contexts. *The Asia-Pacific Education Researcher, 30,* 597-609. https://doi.org/10.1007/s40299-021-00600-x

Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. Routledge.

Pingmuang, P., & Koraneekij, P. (2022). Mobile-assisted language learning using task-based approach and gamification for enhancing writing skills in EFL students. *Electronic Journal of e-Learning*, *20*(5), 623-638. https://doi.org/10.34190/ejel.20.5.2339

Purpura, J. E., & Turner, C. E. (2013). *Learning-oriented assessment in classrooms: A place where SLA, interaction, and language assessment interface*. ILTA/AAAL joint symposium on "LOA in classrooms."

Purpura, J. E., & Turner, C. E. (2014). *A learning-oriented assessment approach to understanding the complexities of classroom-based language assessment*. Presentation at the roundtable on learning-oriented assessment in language classrooms and large-scale contexts. Teachers College, Columbia University.

Şad, S. N., Özer, N., Yakar, Ü., & Öztürk, F. (2022). Mobile or hostile? Using smartphones in learning English as a foreign language. *Computer Assisted Language Learning*, *35*, 1031-1057. https://doi.org/10.1080/09588221.2020.1770292

Saidouni, K., & Bahloul, A. (2016). Teachers and students' attitudes toward using mobile-assisted language learning in higher education. *Arab World English Journal (AWEJ) Special Issue on CALL*, (3). https://dx.doi.org/10.2139/ssrn.2822983

[ Downloaded from c4i2016.khu.ac.ir on 2026-10-31 ]

[ DOR: 20.1001.1.17351634.2023.26.2.12.9 ]

Saygili, K. E. (2021). *Effects of learning-oriented assessment on students' academic writing ability.* Unpublished PhD dissertation. Yeditepe University.

Tavassoli, K., & Rahmatollahi, M. (2023). Differential impact of asynchronous and synchronous computer-assisted dynamic assessment on higher-order and lower-order writing skills. *Journal of Language Horizons*. https://doi.org/10.22051/lghor.2023.41130.1720.

Uwizeyimana, V. (2018). *An investigation into the effect of mobile-assisted language learning on Rwandan university students' proficiency in English as a foreign language* (Doctoral dissertation, Stellenbosch: Stellenbosch University).

Wale, B. D., & Bogale, Y. N. (2021). Using inquiry-based writing instruction to develop students' academic writing skills. *Asian-Pacific Journal of Second and Foreign Language Education*, *6*(1), 1-16. https://doi.org/10.1186/s40862-020-00108-9

Winstone, N., & Carless, D. (2020). *Designing effective feedback processes in higher education: A learning-focused approach*. Routledge.

Yan, Z., & Carless, D. (2022). Self-assessment is about more than self: the enabling role of feedback literacy. *Assessment & Evaluation in Higher Education*, *47*(7), 1116-1128. https://doi.org/10.1080/02602938.2021.2001431

Yeh, S. W., & Chen, C. T. (2019). EFL learners' peer negotiations and attitudes in mobile-assisted collaborative writing. *Language Education & Assessment*, *2*(1), 41-56. https://dx.doi.org/10.29140/lea.v2n1.100

Zhang, Y., & Guo, H. (2012). A study of English writing and domain-specific motivation and self-efficacy of Chinese EFL learners. *Journal of Pan-Pacific Association of Applied Linguistics*, *16*(2),101-121.

Zhang, X. (2021). Mobile-assisted writing instruction: Affordances, challenges, and future directions. *International Journal of Interactive Mobile Technologies*, *15*(10), 194-207. https://doi.org/10.3991/ijim.v15i10.21519

[ Downloaded from c4i2016.khu.ac.ir on 2026-10-31 ]

[ DOR: 20.1001.1.17351634.2023.26.2.12.9 ]