

# Contributions of Mobile-mediated Audio- vs. Text-based Metalinguistic Corrective Feedback on L2 Writing Development: A Mixed-methods Study

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## Abstract

The current study scrutinizes the effects of mobile-mediated audio-based and text-based metalinguistic corrective feedback (MCF) on the development of unreal conditional by Iranian EFL learners via a pretest-posttest design. Furthermore, semi-structured interviews explore the 5 learners' perceptions of the efficacy of mobile-mediated audio-based and text-based MCF. On this ground, 60 intermediate-level Iranian EFL learners were assigned to two groups: audio-based and text-based. The participants in both groups completed various written production tasks during their 3 treatment sessions and were given either text-based or audio-based MCF for their errors, depending on their specific treatment condition. The implementation of these feedback types was monitored throughout the study period to ensure consistency and adherence to the research protocols. The statistical test using ANCOVA was conducted to measure the comparative effectiveness of both feedback types. The results suggest that second language (L2) writing development can be achieved through both text-based and audio-based MCF, but the latter is more effective. The results of the content analysis showed that students who received audio-based feedback had better perception and found it more beneficial in improving L2 writing development compared to those who received text-based feedback. These findings have implications for language teaching methodology and the integration of mobile technology in language learning environments.

## 1. INTRODUCTION

For over twenty-five years, research has explored mobile-assisted language learning (MALL), with a focus on the significance of technology, particularly mobile devices, in our daily lives (Burston, 2014). Ally (2013) contends that we are now in the era of mobile technology, which will revolutionize work, business practices, social interactions, and learning methods as mobile technology continues to expand. Despite the positive impacts of technological changes in education, the use of mobile technologies in MALL has not fully harnessed their advantages, such

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as portability, easy access, authenticity, and situated learning (Stockwell & Hubbard, 2013). This lack of pedagogical innovations in MALL is particularly evident (Burston, 2014). Despite the advantages of mobile technology in language learning and skill enhancement, there is a limited understanding of its effectiveness in providing corrective feedback (CF) on language learners' output. Researchers have shown increasing interest in using technology, including mobile devices, for CF delivery (Bahari, 2021). One type of CF is metalinguistic, which involves providing explicit comments on learners' errors (Suzuki et al., 2019).

Mobile devices have the potential to create favorable conditions for language learning, both within and beyond traditional language classrooms. They offer various advantages, such as the provision of CF. Extensive research on MALL supports its beneficial role in multiple aspects, including increased exposure to the target language, customization according to learners' preferences and habits, and improved performance in various L2 skills. Additionally, MALL can serve as a valuable tool to encourage learners' active involvement with written and spoken feedback, thereby fostering a deeper understanding and mastery of these areas (Nassaji & Kartchava, 2021). Mobile-mediated feedback (MMF) can be delivered in various modes, including text-based, audio-based, and video-based, using both synchronous and asynchronous communication. While text-based CF has been extensively studied in second language (L2) development (Gurzynski-Weiss and Baralt, 2015; Sauro, 2009; Shintani, 2016; Yilmaz, 2012), little is known about the impact of other modes, such as asynchronous audio-based CF (Rassaei, 2019). Further research is necessary to determine how MALL can be incorporated into classroom practices as an instructional tool that aligns with the teacher's curriculum and lesson plans. While there is abundant research on the utilization of MALL in L2 teaching, and learners generally have a positive perception of portable devices and use them regularly, the role of MALL in providing CF is a relatively recent and unexplored area. Consequently, our understanding of how MALL facilitates L2 learning is limited. Additionally, there is a significant amount of work yet to be done in investigating how MALL can be utilized for delivering and assessing the effectiveness of feedback in both classroom and non-classroom settings, as well as examining the impact of MALL on feedback provision by teachers, experts, and learners (either peers or self) and the challenges they encounter during this process. Nevertheless, it is evident that MALL is a permanent and expanding aspect of education. This emphasizes the pressing need for research in this field and the importance for educators to embrace the use of mobile technology for learner-centered education that is accessible anytime and anywhere (Ally, 2013). Furthermore, there is a gap in research regarding the impact of mobile-mediated text-based and audio-based CF on L2 writing development and the perceptions of L2 writers (to the researchers' knowledge). L2 learners' errors are prevalently dealt with by L2 writing language teachers (Nushi, et al, 2023). Rassaei (2019) highlights that "asynchronous audio-based and text-based interaction possess distinct instructional values" (p. 98). Nevertheless, there is limited knowledge about how these different feedback forms influence L2 learning, particularly in terms of CF. Although previous studies on CF (Cheng and Yan, 2022; Cheng and Zhang, 2022; Nassaji and Kartchava, 2021) indicated the rewarding role of CF, some others asserted its ineffectiveness owing to individual differences (Li, 2010; Nassaji et al., 2023). Moreover, previous studies mainly focused on simple linguistic features such as articles, third person singular, simple past tense, and English prepositions (Bitchener and Storch, 2016; Mujtaba et al., 2022; Rassaei, 2019). In this particular context, there is another factor that could potentially influence a learner's ability to recognize the distinction, and that is the specific linguistic form or structure being focused on. Complex structures, such as the hypothetical conditional and the passive voice, which consist of multiple linguistic elements or components, may benefit from targeted attention if metalinguistic feedback is given. This feedback can be provided alongside or without direct error correction, coupled with an explanation of the form, as suggested by Bitchener

and Storch (2016) and (Li, 2010). Therefore, this study investigates the impact of mobile-mediated asynchronous text-based and audio-based CF on L2 writing development concerning the more complex grammatical structure of the unreal conditional and L2 writers' perceptions towards the type of CF they received.

## 2. LITERATURE REVIEW

### CF and L2 Development

Drawing on cognitive-interactionist perspectives, this study attempted to direct the attention of L2 learners to linguistic features during meaningful interactions that support the development of interlanguage (Long, 1996). An interactionist approach to CF, known as the focus on form technique, argues that feedback contributes to interlanguage development by helping learners notice the connections between form and meaning and make adjustments to their incorrect utterances (Gass & Mackey, 2015). CF has gained significant attention from L2 writing teachers and SLA researchers in recent decades. Lyster and Ranta (1997) identified six types of CF, including explicit feedback, recast, clarification, metalinguistic, elicitation, and repetition. Schmidt (2001) noticing hypothesis is a prominent framework often discussed in relation to CF effectiveness. According to Schmidt (2001), noticing and attending to the linguistic forms and structures presented in the input is essential for acquiring those forms, thereby facilitating L2 acquisition. When learners receive CF, it allows them to recognize the disparity between erroneous and correct forms and structures (Gass & Lewis, 2007). CF is considered highly effective in promoting L2 development by providing EFL learners with the correct form of their grammatically incorrect and unacceptable structures (Swain & Suzuki, 2008). Additionally, it plays a significant role in enhancing motivation to write (Ferris (2010); Ferris et al. (2013). Positive evidence, on the other hand, refers to grammatically correct and appropriate forms that indicate what is considered linguistically accurate. Additionally, adherents of the cognitivist theory maintain that intentional learning, including instruction and CF, is crucial for automating controlled processing (McLaughlin, 1987). Shintani (2016) discusses the concepts of automatization and proceduralization in skill-learning theory. According to this theory, proceduralizing happens as learners utilize declarative knowledge of a grammatical structure while practicing it receptively or productively. Automatization, on the other hand, occurs later when learners extensively practice the structure in real operating conditions (DeKeyser, 2015). This theory aligns with the widely used L2 teaching approach known as 'presentation, practice, and production (PPP)', where metalinguistic information is presented, learners engage in controlled exercises to produce the target language feature, and finally, they have the opportunity to use the target form in meaningful activities.

Numerous prior studies (Han and Hyland, 2019; Rassaei, 2013) have demonstrated the effectiveness of various CF types in L2 development, particularly in addressing linguistic errors among EFL/ESL learners. Nonetheless, further research is necessary to investigate the impact of different technology forms, specifically mobile devices, on L2 writing development.

### Mobile-Assisted Language Learning

In the 21st century, there has been a growing interest in the study of MALL. Initiatives like "Bring Your Own Device" encourage students to use their mobile devices in educational settings. The high availability of mobile devices among learners has proven effective in bridging the gap between social and educational activities (O'Bannon & Thomas, 2014). MALL represents a progressive technological advancement focusing on mobile devices and offering diverse learning opportunities (McQuiggan et al., 2015). Cell phones have become smaller in size while their capabilities have increased over time. Nowadays, these devices commonly offer features such as

Internet connectivity, voice messaging, SMS text messaging, cameras, and even video recording (Chinnery, 2006). The current study utilized text- and voice messaging via Internet access on WhatsApp applications.

According to Hsu (2016), MALL involves the use of various technologies like mobile phones, tablets, and similar advancements. Zarei et al. (2017) highlight the ubiquitous nature of such technologies and social media accessible to everyone. Researchers suggest that integrating these technologies into language courses, alongside traditional teaching methods, can enhance learner motivation and overall learning progress (p. 1-2). Several platforms and modes in the CALL and MALL environment have investigated the role of CF. Previous research has examined the impact of oral feedback provided during interaction through mobile applications or video conferencing. These studies have shown positive effects on various aspects of language development. For instance, speaking ability (Xu & Peng, 2017), noticing and learning grammatical features (Monteiro, 2014; Rassaei, 2022) pronunciation (Dai & Wu, 2021), learning of Mandarin tones (Bryfonski & Ma, 2020), as well as opportunities for peer interaction, increased motivation, engagement, and active learning (Chun, 1994; Dao et al., 2021). Yet, the area of written corrective feedback (WCF) using MALL to provide and assess the effectiveness of CF is a relatively recent field. Additionally, limited time constraints in traditional classrooms prevent teachers from providing individualized CF to students; instead, feedback is given to the entire class (Li, 2010). Mobile devices provide learners with innovative opportunities for language learning, unrestricted by limitations of time and space. Also, MALL stands in contrast to traditional learning approaches, as it empowers learners to take control and participate in activities that cater to their specific requirements (Pettit and Kukulska-Hulme (2007). The primary goal of CF is to enhance learners' writing accuracy. Different techniques can be employed, ranging from indirect to direct corrections (Ellis, 2006). Alternatively, feedback can be given by signaling the error without immediately providing the correction. Previous studies have indicated the beneficial impact of technology in delivering different types of CF (Nassaji & Kartchava, 2017). While there is limited research on MMF, there is evidence suggesting its potential to improve L2 writing development (Pourdana et al., 2021; Rodríguez, 2022).

Sheen (2007) found that learners struggle to process teacher feedback in such settings. Moreover, modern learners are increasingly focused on mobile phones and learning through mobile applications, potentially reducing their interest in classroom CF and preferring CF through mobile devices. Mobile devices offer convenience by overcoming time and space limitations, and the availability of new applications enables learners to interact through voice, text, and video chats, facilitating various communication opportunities. MALL has several benefits related to learners' perceptions (Hsu, 2013), assessment purposes (García Laborda et al. (2014); Tarighat and Khodabakhsh, 2016), learning strategies (Qian et al., 2018), and feedback. Recent studies have explored MALL's effectiveness in language education (Ebrahimpour et al., 2016; Ghorbani and Ebadi, 2020; Xodabande, 2017; Xu and Peng, 2017; Zarei et al., 2017). However, these studies have not addressed CF in MALL considering language learners' perceptions.

## L2 Learners' Perception of Feedback

Understanding the impact of feedback on learning involves recognizing how learners allocate their attention and resources when receiving feedback. Noticing plays a fundamental role in language acquisition, with all learning requiring some level of attention, even if not deliberate (Schmidt, 1995). The connection between feedback and learning hinges on whether learners notice the feedback. For feedback to be effective, learners must not only perceive it as corrective but also recognize the specific aspect of their output that needs correction and understand how to address it. The explicitness of feedback greatly influences its noticeability, with different types of feedback varying in their explicitness, leading to varying perceptions and reactions from learners. Implicit

feedback may be harder to identify, making explicit CF, such as mobile-mediated feedback (MCF) (Suzuki et al., 2019), more accessible to learners.

Learners' metalinguistic skills can influence their ability to comprehend and interpret feedback accurately. (Carroll, 2001) suggests that perceiving feedback as corrective requires a certain level of language knowledge, involving thinking about language as an object. An essential area of feedback perception study investigates the connection between how learners perceive and interpret feedback and their L2 learning. Although it is commonly assumed that learners who perceive feedback better are more likely to benefit from it, there is limited empirical evidence to support this idea (Nassaji, 2015) points out that only a few recent studies have explored the relationship between feedback perception and L2 development. For instance, Mackey (2006) research investigated the impact of interactional feedback on ESL learners' noticing of target forms and whether this noticing was associated with improved learning outcomes. The study included 28 participants from two intact classes within a university-level intensive English program. One class served as the experimental group, receiving feedback, while the other class acted as the control group. The results revealed that learners who received interactional feedback exhibited a greater level of noticing for all three target forms (question forms, plurals, and past tense forms) compared to those who did not receive feedback. Moreover, participants who reported noticing the target forms demonstrated higher levels of learning, especially in the case of question forms. In another study by (Egi, 2007), the relationship between learners' interpretation of recasts and their L2 development was explored. The research involved 49 Japanese foreign language learners who engaged in task-based activities and received recasts for morphosyntactic and lexical errors. The findings indicated that learners' interpretation of recasts influenced their learning outcomes. Participants who viewed recasts as positive evidence or both positive and negative evidence demonstrated greater gains compared to those who perceived recasts as a response to content. Notably, learners who interpreted lexical recasts as positive evidence showed significantly higher learning progress than others. The study also noted that learners were more likely to interpret recasts as a response to content when the recasts differed from their production and when they were lengthy. The study underscores the significance of learners' recast interpretation and suggests that recast features may impact interpretation and subsequent learning outcomes.

Research on CF perception remains limited, and to the best of our knowledge, no study has investigated L2 writers' CF perception in the context of MALL.

### Text-Based vs. Audio-Based Corrective Feedback

In traditional language learning, teachers primarily provided written or computer-mediated feedback (CMF) in text form. However, technological advancements have introduced new modes of CF, such as audio-based and visual-based feedback, offering more personalized and motivating learning experiences (Bueno Alastuey, 2011). Each mode has distinct educational benefits. Text-based CMF allows learners to focus on spelling and grammar, while audio-based CMF aids in understanding suprasegmental aspects of language (Rassaei, 2019). The inclusion of an interlocutor's voice in audio-based CMF enhances the social element of asynchronous computer-mediated feedback (Rassaei, 2022). Scholars advocate for incorporating audio-based feedback in computer-mediated interaction to improve learners' satisfaction and learning outcomes (Ice et al., 2007). Analyzing the utilization of audio feedback dates back to the 1970s, during which educators trialed the practice of providing audio remarks to students through cassette tapes (Anson, 1997; Pearce and Ackley, 1995). Based on the literature above, it can be argued that audio-based CMF offers greater media richness compared to text-based CMF, as supported by scholars (Hew and Cheung, 2012; Wise et al., 2004). Lack of media richness and social presence in text-based CMF may hinder learners' performance (Anderson et al., 2001). Using voice in audio-based computer-

mediated communication is likely to foster a stronger sense of social presence, aiding learners in improving their language usage.

Despite the arguments mentioned earlier, prior research on L2 acquisition does not offer any evidence regarding the impact of asynchronous audio-based CF on L2 development. Therefore, the present study aims to address this gap by comparing the effects of asynchronous text-based CF and audio-based CF on L2 development. As mentioned before, the existing research on mobile-mediated instruction is limited, and considering the increasing interest in technology-based L2 instruction, further studies are required to gain a better understanding of the effectiveness of various forms of mobile-mediated CF for L2 development. Although a limited number of studies have explored the effectiveness of audio-based/text-based MMF on L2 writing development (Mujtaba et al., 2022; Rassaei, 2019), no study has investigated the efficacy of mobile-assisted audio-based versus text-based MCF. Besides, the reason why the researchers recruited a metalinguistic type of CF is the use of intermediate-level participants having a partly good command of English language proficiency and possessing relatively high cognitive processing (Ellis, 2008). Hence, the current research aims to shed light on this matter by comparing the impact of mobile-assisted text-based and audio-based CF on L2 writing development.

To investigate the present study the following questions are suggested:

1. Is there any significant difference between the effect of audio-based and text-based metalinguistic corrective feedback on Iranian EFL learners' accurate use of the unreal conditional?
2. What are the Iranian EFL learners' perceptions towards the efficacy of audio-based and text-based metalinguistic corrective feedback?

### 3. METHOD

#### Participants

Initially, the research enlisted the participation of 94 EFL learners characterized by an intermediate level of proficiency, constituting a diverse group comprising both Iranian male and female participants. From this initial assemblage, the final cohort for the study was assembled on a convenience sampling basis, consisting of 60 bilingual individuals currently pursuing undergraduate studies in the Department of Foreign Language Education at Islamic Azad University. The participants had already taken grammar and writing courses in previous semesters and were acquainted with different grammatical structures, including various types of conditional forms, but they were unable to produce such a structure accurately in the pretest. The age range of these participants spanned from 19 to 23 years, each hailing from a Persian-speaking background and specializing in English as their major. Employing the convenience sampling technique, these candidates were selected after undergoing the Oxford Placement Test (OPT) and demonstrated compliance with the intermediate-level criteria (Hamidi et al., 2022).

#### Instruments

##### *Oxford Placement Test*

To ensure uniformity in the participants' L2 proficiency, we administered the Oxford Placement Test (OPT), an adopted collaborative creation of Oxford University Press and Cambridge ESOL. The OPT's adaptability rendered it an ideal instrument for classifying participants into distinct proficiency levels. Facilitating a straightforward administration process, the test required approximately 30 minutes per participant, with seamless grading facilitated by an overlay. Those achieving scores between 28 and 47 were deemed to possess an intermediate level of proficiency, qualifying them as suitable candidates for inclusion in the study sample. Notably, Hamidi et al. (2022) attested to the high reliability of the test ( $\alpha = .87$ ) based on Cronbach's alpha, while

Motallebzadeh and Nematizadeh (2011) and Wistner et al. (2009) concurred on its equally elevated construct validity.

### *Writing Prompt*

In a pretest-posttest design, data were gathered from participants through various writing prompts to assess their learning of L2 grammatical structure after using audio and text-based MCF. The researchers solely checked a series of writing tasks of some standardized tests and found some writing topics providing obligatory contexts to elicit conditional type II. Having attained unanimity, the researchers selected the most appropriate topics. Content validity was ensured by two experts in language testing and assessment. Each session involved the participants writing a composition of at least 70 words within approximately 20 minutes. The essay topics focused on unreal situations to evoke the target structure (unreal conditional).

### *Target Structure*

The study focused on the unreal conditional, consisting of two sentences with conditional clauses—an “if clause” and a “main clause”—each containing a verb. The correct use of tenses in these clauses is vital, as it determines the sentence's meaning. Generally, the dependent clause employs the simple past tense, while the main clause uses the present conditional tense, as shown in the following example.

Example:

*If I had money, I would travel around the world.*

The decision to center our attention on the unreal conditional arises from its well-established reputation as a formidable linguistic construct, characterized by intricate syntactic and semantic intricacies (Celce-Murcia & Larsen-Freeman, 1999). Mastering this structure necessitates a comprehensive grasp of the tense-aspect system, modal auxiliaries, and negation. As a result, learners often find themselves grappling with numerous errors when endeavoring to construct hypothetical conditional sentences. It is precisely this challenging nature that renders the unreal conditional an ideal focal point for our current investigation.

### *Writing Task Scoring*

Izumi et al. (1999) scoring method was incorporated in this study, serving as a robust framework to assess the accuracy of conditional sentences. The scoring method meticulously assigned one point for each correctly executed component feature found within both the “if clause” and “main clause” of the sentence. Moreover, if all the features were seamlessly integrated with precision, a well-deserved point was rightfully bestowed upon the learner. Notably, as expounded upon in Shintani et al. (2014) study, even an earnest attempt made by a learner to construct a sentence containing a dependent clause corresponding to one of the conditional sentences, regardless of its accuracy, was acknowledged with a point. The rationale behind opting for this scoring method lies in its capacity to engender a more refined data analysis. Doing so mitigates the risk of students focusing solely on learning and applying a single component of a conditional sentence, inadvertently overlooking the other essential elements (Rassaei, 2022).

The intra-rater and inter-rater reliability of the scores were determined. To measure intra-rater reliability, the texts were double-scored by one researcher two months after the initial marking. Pearson correlation coefficients were calculated for the scores of the four writing tasks: 0.92 (Writing 1), 0.989 (Writing 2), 0.93 (Writing 3), and 0.88 (Writing 4). For the two revision tasks, the correlation coefficients were: 0.91 (Revision 1) and 0.95 (Revision 2). Inter-rater reliability was examined by having two EFL teachers independently score the writings. Pearson correlation coefficients for the two sets of scores in the four writing tasks were: 0.91 (Writing 1), 0.90 (Writing

2), 0.94 (Writing 3), and 0.89 (Writing 4). The correlation coefficients for the two scores in the two revision tasks were: 0.90 (Revision 1) and 0.87 (Revision 2).

### *Semi-Structured Interviews*

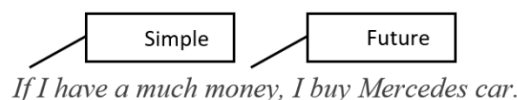
To learn more about how the students felt about the interventions, interviews were carried out with their consent. To gain a comprehensive understanding of participants' perspectives on the effectiveness of audio- and text-based MCF in enhancing L2 writing development, researchers conducted open-ended interviews with five randomly selected participants from each group (Creswell & Creswell, 2018). Morse (2015) underlined that small sample sizes, even five participants, can be sufficient in qualitative research. The interviews were conducted in Persian, the participants' native language, to reduce misunderstandings and facilitate their ability to think about and communicate their opinions. During the interviews, a script with six items was used. In the script, there were yes/no questions as well as open-ended ones, like "Do you think that text-based/audio-based feedback had more impact on your accurate use of unreal conditional development in L2 writing?", "Do you think that audio-based/text-based feedback was helpful?", "Do you prefer text-based or audio-based feedback?", "Did text-based/audio-based feedback make you interested in addressing your errors in subsequent revisions of drafts?", and "Did text-based/audio-based feedback have any effect on your engagement in your writing Process?". It is important to note that the participants selected for the interview had already been notified about the availability of diverse feedback modes, including text-based and audio-based CF after the tutorial sessions. Once the learners gave their permission, a twenty-minute video recording was made of each interview. Following that, the authors translated the interviews into English.

Semi-structured interviews are an important research technique that combines the advantages of structured and unstructured interviews, providing flexibility in data collection while maintaining a certain level of consistency (Dornyei, 2014). This method allows researchers to obtain detailed and nuanced responses from participants, enabling a thorough investigation of their viewpoints, experiences, and attitudes (Patton, 2015).

Five participants were interviewed owing to the availability issue. During the online, individual interviews, the participants, whose native language was Farsi, received an explanation of the difference between audio and text-based MCF.

### *Data Collection Procedure*

To investigate the impact of grammatical accuracy on L2 writing development, participants underwent a practice session to familiarize themselves with the experimental design. They were informed about the writing tasks, and additional sessions were arranged to ensure their understanding. Based on the OPT results, 60 intermediate-level learners were selected from the university student population. These participants were divided into two groups: audio-based and text-based, each receiving distinct treatment (audio-text CF) as outclass practices at home. Five participants from each group were interviewed to gauge their perspectives on the effectiveness of audio and text-based MCF. Mobile-mediated text-based CF was implemented by incorporating concise written notes to the learners' highlighted incorrect expressions within a PDF document. When learners interacted with the underlined words, they were able to access a comment box containing the accurate version of the error. Regarding the content, the audio-based CF mirrored the text-based CF. For example:



**Figure 1: The text-based CF**

Nevertheless, learners were able to listen to the correct form of their errors by playing the voice message instead of visually encountering each correct form within a comment box while clicking on underlined erroneous expressions in a PDF file.

As a pretest, learners were given a writing topic on the mobile phone that required them to use the target structure. They completed the writing tasks on a piece of paper which were sent to the teacher for correction purposes through WhatsApp application. The writing prompts provided to the students were “*What would you do if you had a lot of money? What would you do if you were a president?*”. Learners (n=34) who had already mastered the structure were excluded from the study. In week 1 day 1, the students in the audio-based group received oral MCF through voice messages, while the text-based group received written MCF via texts, with feedback provided on WhatsApp. The same procedure was followed in weeks 2 and 3 along with revisions, which were checked and authenticated by the teacher. At the end of week 4, an immediate post-test was conducted. Notably, students in both groups produced new pieces of writing after each feedback and revision session. The collected data was then ready for analysis and interpretation.

### Design

In this investigation, a mixed-methods strategy was embraced, encompassing the amalgamation of quantitative and qualitative data collection techniques. For the quantitative facet, an experimental pretest and posttest design were deployed, gauging learners' prowess in acquiring the designated linguistic structure. Simultaneously, the qualitative dimension was attended to, involving the facilitation of insightful semi-structured interviews to glean profound comprehension of learners' perceptions concerning the implemented approach. Hence, the current study adopted a “sequential explanatory design,” in which “first quantitative data were collected and analyzed; then to further explain the results qualitative data were collected and analyzed; finally, interpretations were based on quantitative qualitative data” (Hashemi, 2012). The researchers found a series of themes via related literature and used them as criteria to identify the existing themes in the interview contents. The new themes in the interview contents were merged with the criteria, using deductive and inductive approaches to thematic analysis (Bingham & Witkowsky, 2022). Member checking was performed on the interview contents in line with Nassaji (2020) to make sure that the data had been interpreted accurately and appropriately to ensure creditability. Every interview was transcribed verbatim and meticulously coded to unearth crucial nuances and intricacies for subsequent analysis (Rassaei, 2022).

### Data Analysis

In this investigation, a mixed methods approach was employed to delve into the influence of audio and text-based MCF in Mobile-Assisted Language Learning (MALL), specifically concerning the acquisition of a complex grammatical structure within the written accuracy of Iranian EFL learners. To quantitatively assess the impact of oral and written MCF on learners' written texts, the researchers opted for ANCOVA as the chosen analytical tool. On the qualitative front, the study entailed conducting semi-structured interviews to gain insight into the participants' perceptions and attitudes regarding the utilization of WhatsApp as a medium for language learning. These interviews were meticulously recorded, transcribed, and subjected to rigorous analysis by

the researchers to unravel emerging themes that both substantiated and enriched the study's findings (Rassaei, 2022).

#### 4. RESULTS

Table 1 displays descriptive statistics for the pretest and posttest regarding the two MCF conditions for the writing tasks.

**Table 1: Descriptive statistics for audio- and text-based CF on pretest and posttest**

|             |                    | N  | Minimum | Maximum | Mean    | Std. Deviation |
|-------------|--------------------|----|---------|---------|---------|----------------|
| Audio-based | Pretest            | 30 | 7.50    | 14.50   | 11.1500 | 2.25584        |
|             | Post-test          | 30 | 13.00   | 20.00   | 17.0333 | 1.72173        |
|             | Valid N (listwise) | 30 |         |         |         |                |
| Text-Based  | Pretest            | 30 | 5.50    | 13.50   | 9.3333  | 2.27556        |
|             | Post-test          | 30 | 10.00   | 18.50   | 14.1500 | 1.97898        |
|             | Valid N (listwise) | 30 |         |         |         |                |

The text-based and audio-based groups were compared using the ANCOVA test. Before running ANCOVA, several presumptions, including the normal distribution of the data, the linear relation of the dependent and covariate variables, the homogeneity of the regression slopes, and the equality of the variances, were evaluated. Once these suppositions were confirmed, the major output of ANCOVA, as shown in the following table, was checked.

**Table 2: The result of ANCOVA on audio-based and text-based groups**

| Source          | Type III Sum of Squares | Df | Mean Square | F       | Sig. |
|-----------------|-------------------------|----|-------------|---------|------|
| Corrected Model | 253.203 <sup>a</sup>    | 2  | 126.601     | 101.576 | .000 |
| Intercept       | 212.926                 | 1  | 212.926     | 170.837 | .000 |
| Pretest         | 128.499                 | 1  | 128.499     | 103.098 | .000 |
| Group           | 36.729                  | 1  | 36.729      | 29.469  | .000 |
| Error           | 71.043                  | 57 | 1.246       |         |      |
| Total           | 14910.250               | 60 |             |         |      |
| Corrected Total | 324.246                 | 59 |             |         |      |

a. R Squared = ,781 (Adjusted R Squared = ,773)

The results of the ANCOVA test revealed a significant difference between the two groups ( $F=29.469$ ,  $P=.000$ ). Accordingly, it can be claimed that one of the methods (text-based vs. audio-based) was more beneficial. Therefore, the estimated marginal means of the two methods were examined to determine which was more successful.

**Table 3: Estimated marginal for each group**

| Group       | N  | Mean                | Std. Error | 95% Confidence Interval |             |
|-------------|----|---------------------|------------|-------------------------|-------------|
|             |    |                     |            | Lower Bound             | Upper Bound |
| Audio-based | 30 | 16.437 <sup>a</sup> | .212       | 16.012                  | 16.861      |
| Text-based  | 30 | 14.747 <sup>a</sup> | .212       | 14.322                  | 15.172      |

a. Covariates appearing in the model are evaluated at the following values: Pretest = 10,2417.

According to Table 3, the audio-based group's mean score was higher than that of the text-based one. Simply put, the former group outperformed the latter group.

#### Perceptions Towards Audio and Text-Based Metalinguistic Corrective Feedback

The second phase of the study investigated how students perceived the effectiveness of audio-based CF and text-based MCF in developing writing skills in L2. The interview data were analyzed

using an inductive approach, which involved identifying broad themes and generalizing based on them. The analysis of the students' responses revealed that they perceived audio-based MCF to be more effective than text-based MCF in improving their writing skills. Specifically, the effectiveness of audio-based MCF was reflected in better communication with their teacher, increased interest, and higher engagement. For example, the students reported that audio-based MCF improved their communication with their teacher, but text-based MCF did not have the same effect, as demonstrated in their interview responses.

- *Since I could hear the teacher's speech, I would be able to create a sense of communication with him. (Excerpt 1, Student 1)*
- *I could communicate with my teacher once I would be able to hear him as if he had been hailing his emotion. (Excerpt 2, Student 1)*
- *Audio-based feedback led me to make use of the comments friendly and this resulted in alleviating the anxiety. (Excerpt 3, Student 2)*
- *Voice-oriented feedback to clarify the ambiguity led to more intelligibility. (Excerpt 4, Student 3)*
- *I could not interact with my teacher due to the stark comments made up of texts. (Excerpt 2, Student 2)*
- *Because text-based feedback overshadowed the social aspect of communication, it was unable to get across the meaning. (Excerpt 3, Student 4)*
- *In text-based feedback, I felt like as if I was receiving feedback on the part of a robot. (Excerpt 4, Student 1)*
- *Since in text-based feedback, the emphasis was laid on the linguistic feature, no communication ever occurred. (Excerpt 3, Student 3)*

The participants expressed a 90% preference for audio-based MCF over text-based MCF, as it increased their interest in writing. This finding aligns with the significant difference in effectiveness between audio-based MCF and text-based MCF, as indicated by the study's quantitative analysis.

- *As I did not encounter audio type of feedback, it was interesting to me and motivated me to correct my errors. (Excerpt 3, Student 1)*
- *I had been feeling that my teacher attached significance to my learning process as I had been hearing his voice message. (Excerpt 1, Student 2)*
- *I noticed that my teacher had been following me up regarding my errors and he spent more time and energy for my learning. (Excerpt 4, Student 3)*
- *In addition to receiving comments on my errors, I received positive feedback praising my correct sentences. (Excerpt 5, Student 2)*
- *The fact that my teacher in audio-based feedback would occasionally remark on the clarity of idea sparked my interest in writing, as his feedback assisted me in improving my grammar. (Excerpt 2, Student 4)*
- *I was not motivated because no communication occurred in text type of feedback. (Excerpt 14)*
- *Due to the absence of the teacher and such a traditional type of feedback, I was exhausted in text-based feedback. (Excerpt 1, Student 4)*
- *Because of such a repetitious sort of feedback, text-based feedback made me demotivated to some extent. (Excerpt 2, Student 3)*
- *Text-based feedback did not inspire me as it appeared to be the same old teaching we had already been taught. (Excerpt 4, Student 4)*

The interviews aimed to elicit student perspectives on the engagement and the effectiveness of audio-based and text-based MCF, as well as their impact on students' confidence and orientation.

- *When using audio, I would jot down notes as I had been listening to the voice messages. This kept me involved as I had to be attentive to the mistakes I had made. (Excerpt 18)*
- *Because I was so immersed in the voice messages, the feedbacks were carved in my mind. (Excerpt 2, Student 1)*
- *I was so engaged in audio-based feedback that it made me pay attention to details. (Excerpt 3, Student 4)*
- *I got so involved that I felt like I have mastered the grammar of concern. (Excerpt 4, Student 3)*
- *Text-based feedback made me simply a passive receiver. (Excerpt 2, Student 2)*
- *Although it contributed to reduce my anxiety, text-based feedback did not engage me to internalize the grammaticality of the sentences. (Excerpt 3, Student 1)*
- *Since text-based feedback is outmoded which is commonly used in different educational settings, it did not involve me with the errors I had made. (Excerpt 4, Student 5)*
- *The audio-based feedback was more effective to me since the message can be conveyed better through audio. (Excerpt 3, Student 5)*
- *The audio-based feedback was much more beneficial in promoting not only grammar but also my pronunciation through listening to the audios while revising my previous drafts. (Excerpt 2, Student 3)*
- *Text-based feedback was impactful to some extent but it was confusing. (Excerpt 1, Student 4)*
- *I did not notice the text-based feedback since it was cumbersome to reflect on the grammar code. (Excerpt 4, Student 2)*
- *The teacher's gentle tone of speech in audio-based feedback led me to boost my confidence. (Excerpt 2, Student 5)*
- *Audio-based feedback helped me a lot because I am more audio-oriented towards any feedback I receive, be it linguistic or non-linguistic-related features. (Excerpt 3, Student 1)*
- *Although text-based feedback was effective to some extent, I am not text-oriented. (Excerpt 1, Student 3)*

The study found that audio-based MCF was more effective in enhancing participants' motivation to communicate in English, with 80% feeling more motivated compared to only 30% for text-based MCF. Students in the audio-based group showed greater interest and enthusiasm in learning and communicating in English, and the majority (85%) had a positive view toward audio-based MCF, compared to only 25% for text-based MCF. When it came to preferences, 90% of the audio-based group preferred using audio-based MCF, while only 23% of the text-based group preferred it. Additionally, most of the audio-based group (90%) expressed a desire to continue using audio-based MCF instead of traditional language instruction.

Engagement was a key factor in students' preference for audio-based MCF, with 70% in the audio-based group feeling more engaged in language learning activities compared to 30% in the text-based group. The audio-based group experienced less boredom and fatigue during activities. Additionally, 82% of students in the audio-based group expressed greater comfort with the feedback they received compared to only 27% of the text-based group.

## 5. DISCUSSION

The primary objective of this research was to compare the impact of audio-based and text-based MCF on Iranian EFL learners' acquisition of the unreal conditional and their perceptions of the effectiveness of these methodologies in L2 writing enhancement. Through rigorous statistical

analysis, it was found that the group exposed to audio-based MCF outperformed their text-based counterparts in terms of L2 writing development scores. This finding corroborates previous studies conducted by [Rassaei \(2019\)](#) and [Yilmaz \(2012\)](#). In the current study, it can be argued that both text-based and audio-based CF methods have been successful in capturing learners' attention to their mistakes. This success can be attributed to the pre-highlighting of errors, allowing learners to visually or audibly perceive the correct forms by selecting their incorrect ones. As a result, both text-based and audio-based CF approaches offer learners both negative and positive evidence. The study's findings suggest that input-focused CF methods are effective in facilitating L2 development, especially when they are prominent enough to allow learners to deduce negative evidence. Additionally, the combination of presenting the correct form (positive evidence) alongside the learners' highlighted incorrect form appears to create an ideal situation for learners to benefit from mobile-assisted text-based and audio-based MCF.

Furthermore, the qualitative analysis of the interviews shed light on the students' attitudes towards the different approaches. Those who received audio-based MCF displayed a more positive outlook on this method as a means to improve their L2 writing skills. They reported higher levels of motivation, perceived effectiveness, preference, and engagement compared to those exposed to text-based MCF. These results underscore the potential benefits of incorporating audio-based strategies in language learning environments and align with the existing literature on the subject.

In the present investigation, the primary inquiry delved into discerning any notable distinctions between the consequences of text-based and audio-based asynchronous MMF concerning L2 writing development. Simultaneously, the study sought to pinpoint the more efficacious feedback modality for augmenting English unreal conditional accuracy among EFL learners. While both text-based and audio-based MCF exhibited effectiveness in promoting L2 writing development, the outcomes distinctly favored the audio-based MCF as significantly more potent compared to its text-based counterpart. This noteworthy discovery gains particular significance due to the prevailing emphasis in earlier research on asynchronous text-based CF ([Rassaei, 2019](#); [Yilmaz, 2012](#)), leaving the impact of mobile-mediated audio-based MCF relatively unexplored in the realm of scholarly knowledge.

This groundbreaking revelation holds profound implications, bolstering the existing body of research that highlights the efficacy of computer-mediated asynchronous CF ([Yilmaz, 2012](#)). Linguistic authorities assert that CF plays a pivotal role in directing learners' attention toward their writing errors and linguistic input. The current investigation not only validates the positive impact of both text-based and audio-based MCF on learners' error awareness but also underscores the significance of salient input provided through MMF in bolstering grammatical accuracy. This novel approach empowers learners to deduce negative evidence, facilitating a more comprehensive understanding of language structures. Moreover, the judicious combination of error identification and highlighting the correct forms within MMF further amplifies its benefits, thereby elevating the potential for enhanced language acquisition outcomes.

The outcomes of this investigation lend robust support to the preeminence of audio-based MCF (MMF) when compared to its text-based counterpart. Schmidt's "noticing" hypothesis (2001) posits that learners must actively engage with CF for it to effectively facilitate the acquisition of grammatical rules and forms. In this context, audio-based MMF proves particularly adept at capturing learners' attention, bringing to their awareness the mismatches between their erroneous output and the provided input, which may have accounted for its superior efficacy. Furthermore, learners within L2 classes generally exhibit greater familiarity with and receptivity to oral CF, rendering audio-based modalities more appealing, congenial, and supportive ([Rassaei, 2022](#)).

Prior research has revealed learners' preference for asynchronous audio-based CF, attributable to its inherent flexibility and ease of comprehension ([Rassaei, 2019](#)). The innate nature of listening,

as opposed to reading and writing, might underpin this predilection (Clark & Walsh, 2004). Additionally, Hew and Cheung (2012) highlight that listening to textual content can elevate motivation levels, engendering a sense of communication and social presence between the text's creator and the listener. This perception of social interaction during conversations, as underscored by Hew and Cheung (2012) and Wise et al. (2004), enhances the overall perception of feedback. The persuasive power of spoken language in attracting engagement, even from initially reticent individuals, further emphasizes the potential impact of audio-based CF (Hew & Cheung, 2012). Consequently, learners exposed to audio-based CF may experience a heightened sense of social presence, which, in turn, fosters a greater inclination to attend closely to the feedback they receive.

In the pursuit of our second research inquiry, we delved into the realm of learners' perceptions of audio and text-based MCF, aiming to ascertain which mode elicited a more favorable attitude. The outcomes gleaned from this investigation unveiled a clear preference among participants for the audio-based condition, deeming it more alluring and fulfilling compared to its text-based counterpart. The learners exposed to the audio condition exuded heightened levels of motivation and engagement, becoming notably proactive in their approach to the learning process. This enthusiastic response showcases the potential potency of audio-based MCF in cultivating a conducive and participatory learning environment (Rassaei, 2022; Wise et al., 2004).

Research suggests that learners' writing can significantly impact their motivation to write. Studies conducted by Ferris (2010) and Ferris et al. (2013) demonstrate that teacher feedback on writing can influence learners' motivation. The effectiveness of CF is also linked to learners' motivation. Thus, it is essential to consider writing motivation when studying CF dynamics. According to (Zheng & Yu, 2018), learners experience various emotions when receiving CF, including positive emotions such as satisfaction, gratitude, and positivity (Han & Hyland, 2019) as well as negative emotions like boredom, pessimism, anxiety (Han, 2017), disinterest (Han & Xu, 2019), and negativity (Zheng et al., 2020). Han and Hyland's study exemplifies a motivated student, Du, who actively corrected her mistakes due to her interest in CF and admiration for her teacher, aligning with our study's findings.

Mobile-mediated CF proved to be beneficial for investigating and enhancing learner engagement and learning outcomes in mobile-based education. Both groups of participants showed improved writing performance, with the audio-based group exhibiting a more significant improvement. The engagement of L2 learners was enhanced through audio-based CF, which involves multi-tasking, such as listening and understanding simultaneously, particularly with the complexity of the unreal conditional structure, which requires a relatively high cognitive load. The teacher's role in creating a secure and encouraging environment for the participants contributed to their willingness to try out the new complex grammatical structure in their writing tasks, indicating increased learner engagement.

## 6. CONCLUSION

In conclusion, the present study demonstrates that audio-based MMF is more effective than text-based MMF in enhancing the grammatical accuracy of the unreal conditional for L2 learners. Additionally, the study reveals themes of motivation and engagement that emerged from semi-structured interviews with the participants. To improve L2 learners' writing, teachers should incorporate both asynchronous audio-based and text-based MCF, not only in class but also in out-of-class assignments, as they offer flexible learning opportunities. Students' desire for recognition from instructors for their writing efforts should not be overlooked, as adult learners require encouragement to stay engaged and confident in their abilities. It is important to recognize that progress in language learning and writing skills involves both effective teaching and active participation and responsibility from the learners, which ultimately fosters motivation and receptivity to new ideas. The findings of the present study implicate that teachers should

acknowledge that L2 language learners may experience varying advantages from different forms of MMF.

The present study has several limitations. Firstly, a delayed post-test was not conducted due to logistical constraints, preventing an investigation of long-term CF impact on L2 writing accuracy. Secondly, the study did not consider gender variations of participants as a potential confounding variable. Thirdly, other qualitative data collection methods such as questionnaires and focus groups were not utilized. Future research could focus on multiple target structures, as suggested by Shintani et al., (2014), although this study specifically targeted a complex grammatical structure. Finally, future studies may consider adopting a sociocultural view and explore both random and negotiated help in different contexts.

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