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Comparative Impact of Teacher-Directed and Technology-Assisted Pronunciation Instruction on Listening Achievement on CMC Platform

Fahimeh Rafi
PhD, Department of English Language Teaching and Linguistics, Za.C., Islamic Azad University, Zanjan, Iran, *fahime.rafi@iau.ac.ir* & *fahime.rafi@yahoo.com*

There are numerous studies comparing teacher-directed and technology-assisted instructions, but not many comparing them on pronunciation instruction, specifically on Computer-Mediated Communication (CMC) platform. This study investigated the comparative impact of teacher-directed and technology-assisted pronunciation instruction on English-as-a-Foreign-Language (EFL) learners' listening achievement on Google Meet™ CMC platform. 65 EFL learners were selected based on a Preliminary English Test (PET). The participants were randomly assigned into two experimental groups. Next, as for the treatment on Google Meet CMC platform, the technology-assisted group used Longman Advanced American Dictionary™ (LAAD) to acquire words pronunciation; while the teacher-directed group received teacher's pronunciation instruction. Immediately after the 10 treatment sessions, there was a virtual posttest and a post hoc interview. The statistical results of paired-samples t-tests in both groups reported significant improvements on summative assessment. The results of independent samples t-test revealed that the teacher-directed group significantly outperformed the technology-assisted group on the posttest. The inductive content analysis of the interview responses elicited six themes which were interpreted as the participants' strong approval in terms of the usefulness of LAAD, positive impact of a teacher, and effectiveness of CMC platform. The findings suggest that integrating teacher-directed instruction within CMC platform creates a robust environment for acquiring pronunciation.

Keywords: computer-mediated, Google Meet, teacher-directed, technology-assisted, computer-mediated communication (CMC) platform

INTRODUCTION

Over the last decades, technology has become vastly a part of learning experience of most learners especially EFL learners around the world in some way or another. The growing use of computer and mobile devices along with wireless technologies (e.g. Wi-Fi, Bluetooth, GPS, satellite systems) has enabled the learners to access every type of training and instructional material from anywhere and at any time (Panagiotidis, et al., 2018). Technological devices can provide immediate feedback, motivate learners, and

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facilitate more profound understanding (Abdel Latif , 2024; Altun & Ahmad, 2021; Nursyafida and Putri, 2025). On the other hand, the global pandemic caused by COVID-19 also revealed the crucial role of virtual environment in teaching and learning on special occasions wherein the process of transformation can be impossible without the use of technology and technological devices. It also revealed the importance of "digital resources, connectivity, and professional development for educators" (Al-Kamzari & Alias, 2024, p.618).

Several scholars have revealed the positive effect of technological devices on different aspects of EFL learning and teaching (e.g. Abdel Latif , 2024; Al-Kamzari & Alias, 2024; Baytak, et al., 2011; Lin & Yang, 2011; Metruk, 2024; Parvin & Salam, 2015). Accordingly, majority of the results revealed that the technology provides unlimited resources to language learners which can be motivating and can encourage them to find appropriate materials and activities in successful language learning (Abdel Latif , 2024; Altun & Ahmad, 2021; Gençlter, 2015). On the other hand, despite rapid technological advancement, there are still numerous scholars and researchers who believe in the significant role of teachers in encouraging, motivating, monitoring, advising, supporting, and counselling the students (Aziz & Kazi, 2019; Yasmin & Islam, 2018). Reviewing the literature, one can find that both teacher-directed and technology-assisted instructions are still two famous and popular strategies of language acquisition in the world.

Some researchers have tried to make a comparison between teacher-directed and technology-assisted instructions in acquiring different skills, sub-skills, and components of English language, such as grammar, vocabulary, speaking, reading, and the like (e.g., Chen, 2014; Mahdi, 2018). Pronunciation is one of the components of English language that most scholars and teachers are aware of its importance in EFL teaching and learning. Pronunciation acquisition is considered as a complicated task as it involves not only the acquisition of sound segments (i.e., consonants, vowels and diphthongs), but also suprasegmental features (i.e., pitch, accent, tone, stress, intonation) (Guion, 2005; Macdonald, 2002). In fact, accurate pronunciation is commonly considered as the foundation of effective spoken communication. Mispronunciations, on the other hand, can affect accuracy and lead to the unintelligibility and breakdown of communication (Thir, 2016). Unfortunately, despite the importance of accurate pronunciation in spoken communication, there are not many studies revealing the differences between teacher-directed and technology-assisted pronunciation instruction. More importantly, there is even less in-depth evidence of comparison between technology-assisted and teacher-directed pronunciation instruction in the absence of face-to-face modality of interaction, through CMC platform. Therefore, it is a venue which asks for further empirical research.

Despite the fact that previous researches have explored the effectiveness of both teacher-directed and technology-assisted instructions, there is little solid evidence of their comparative effect on words pronunciation instruction (Johnson, 2022; Lee & Park, 2025). Similarly, despite the extensive SLA studies on the potentials of computer-mediated communication (CMC), a few studies incorporated the comparative effect of teacher-directed and technology-assisted pronunciation instruction on CMC platform

(Kim & Park, 2025; Martinez & Lee, 2024). This platform presents unique challenges and opportunities for language learning, and understanding the optimal approach for pronunciation instruction in this environment is crucial for educators and learners alike. Therefore, the present study attempted to bridge the gap in the EFL literature on the comparative impact of teacher-directed and technology-assisted words pronunciation instruction on learners' listening achievement on CMC platform.

Literature Review

Teachers' Role in Second Language Acquisition (SLA)

According to Vygotsky's (1978) sociocultural theory, individuals learn best through collaboration and guidance from more experienced individuals. That is, from a sociocultural perspective, the presence of the language teachers in the classroom environment can be essential in the improvement of students' achievement. In other words, in second language (SL) or foreign language (FL) teaching and learning environment, teachers' role is of paramount significance. Teachers provide learners with hints and feedback which can encourage and motivate learners to continue the difficult learning path (Aziz & Kazi, 2019). Williams (2008) argued that in teacher-directed classes, there is always an active negotiation between teachers and students which help the learners rectify or at least recognize their problems. In the same vein, Aziz and Kazi (2019) supported the positive role of teachers in enhancement of EFL learners' classroom participation at universities. It was also pointed out that skilled language teachers would employ better strategies such as creating a friendly environment, developing rapport with students, telling enjoyable jokes to reduce anxiety, and encouraging the students to speak stimulate them to become more responsive in the classroom.

Reviewing the related literature and surveying different teaching methods and methodologies, one can find different roles for teachers. Traditional methods emphasized teachers' roles as authority and omniscient; while the new trends and approaches in language teaching provide a teacher with variety of such different roles as facilitator, advisor, counsellor, organizer, monitor, participant, controller, resource, tutor, motivator, supporter, stimulator, and the like (Aziz & Kazi, 2019; Yasmin & Islam, 2018). Teachers' influence on learners is not just by their oral instructions; they can use body language, facial expressions, error correction, and the like, in order to make learners understand what is taught (Sakale, 2019). Teachers can also play different roles in pronunciation instruction by providing immediate feedback, modelling correct pronunciation, and using different techniques like visual aids or phonetic explanations. They can create a supportive and low-anxiety environment that encourages students to practice and improve their pronunciation.Teachers can also help students by providing them with opportunities for self-assessment and reflection which can make them aware of their own pronunciation strengths and weaknesses (Derwing & Munro, 2015; Sakale, 2019).

Technological Advancement and SLA

Today, rapid technological advancement is altering the prospect of second and foreign language teaching and learning. Technological devices such as computers, laptops, projectors, and mobiles are now seen as an essential means of teaching in language centers. Nowadays, the application of technology has considerably altered language teaching pedagogy and, at the same time, it made language teaching more interesting and productive (Abdel Latif, 2024; Ahmadi, 2018). Al-Kamzari and Alias (2024) conducted a research on the integration of technology in educational content and revealed the positive impact of mobile instant messaging. Moreover, Metruk (2024) reviewed various articles on the effect of mobile devices on students' pronunciation performance and reported the positive impact of smartphones. Considering the attitude of the students, Metruk (2024) also came to the conclusion that mobile-assisted pronunciation learning was very motivating for the learners because it could provide them with a new and exciting way of learning pronunciation. In fact, as their major agenda, technological devices can assist learners in adjusting their own learning process and having access to the information that even their teachers are not able to provide (Pourhosein Gilakjani, 2017).

There are different computer-mediated studies on teaching accurate pronunciation (Seferoglu, 2005) and also correct patterns of stress and intonation (Levis & Pickering, 2004). Moreover, there are several computer-mediated comparative studies on vowels and consonants (Wang & Munro, 2004). The findings revealed the positive role of computer technologies in pronunciation acquisition (Mahdi & Al Khateeb, 2019). The researcher in the present study has made use of a popular computer-mediated communication (CMC) platform called *Google Meet*™ (formerly known as Hangouts™). Google Meet is a video conferencing service, which has been developed by Google. It was developed to let up to 100 people join a virtual meeting, and speak or share videos, text messages, or even photos with each other from anywhere with internet access (Steven, 2020). Moreover, Meet is a modern application suitable to be used in computers, laptops, Android, and also IOS systems. On the other hand, *Longman Advanced American Dictionary™ (LAAD)* is also a mobile-mediated application used in the present study. LAAD is the application, which was used by the participants in the technology-assisted group as the technology-mediated words pronunciation modality of instruction. LAAD not only allows its users to listen to the English native speaker's aural pronunciation of the words, but it also provides them with the opportunity to record their own voice and compare it to the native speaker's.

Accurate Pronunciation and SLA

It is beyond doubt that accurate pronunciation in a foreign language is a key quality which determines the oral proficiency of the language learners to a large extent, since it is directly related to the development of students' communicative competence and comprehensibility (Pourhosein Gilakjani, 2017). Numerous researches have been done on the importance of pronunciation and its instruction in language classes and the findings clearly indicated that pronunciation instruction can improve EFL/ESL learners' oral production (Abdel Latif, 2024; Abdolmanafi-Rokni, 2013; Farhat & Dzakiria,

2017; Pourhosein Gilakjani, 2014; Metruk , 2024). Acquiring accurate pronunciation has always been one of the most difficult aspects of language learning and teaching since it involves not only the acquisition of sound segments (i.e., consonants, vowels and diphthongs), but also suprasegmental features (i.e., pitch, accent, tone, stress, intonation) (Guion, 2005; Macdonald, 2002).

Butler-Pascoe and Wiburg (2003) proposed five major objectives for teaching words pronunciation: (1) to develop English that is easy to understand; (2) to develop English which leads to communicative competence; (3) to help learners feel more comfortable while speaking; (4) to develop self-consciousness in oral communication; and (5) to develop speech awareness and personal speech monitoring skills. These five objectives can clearly indicate that by learning accurate pronunciation of the words, learners can easily convey their meaning, and this can not only lead to a pleasurable and successful communication, but also develop self-awareness and speech consciousness. Language learners may lose their confidence when they cannot convey their meaning and notice that nobody can understand what they say. Therefore, this is a crucial responsibility on language teachers' shoulders to help learners become familiar with words pronunciation and have a more enjoyable and successful communication.

Aim and Research Questions

This research set on a quasi-experimental mixed-methods design (Salkind, 2010) to compare the effect of teacher-directed and technology-assisted English words pronunciation instruction on participants' listening comprehension on Google Meet CMC platform. Accordingly, the following research questions were posed in the present study:

1. Does teacher-directed pronunciation instruction have any impact on EFL learners' listening achievement on Google Meet CMC platform?

2. Does technology-assisted pronunciation instruction have any impact on EFL learners' listening achievement on Google Meet CMC platform?

3. To what extent do teacher-directed and technology-assisted pronunciation instructions make any different impacts on EFL learners' listening achievement on Google Meet CMC platform?

4. What is the EFL learners' self-evaluation of (a) instruction modality and (b) Google Meet CMC platform?

METHOD

Participants

Based on a non-random convenience sampling method, sixty-five Iranian EFL learners within the age range of 18-35 years (Mean = 21.8) were selected to take part in this study. The participants were university undergraduate students majoring in Psychology. The length of their formal exposure to English was four years in average. Enrolled in the general English course at the university level, the participants received the language content mostly in English as the main medium of instruction and randomly in Persian.

Prior to the administration of the treatment, the Preliminary English Test (PET): Listening sample Paper 1 (UCLES, 2004) was run to determine the homogeneity of the participants in their listening ability. The test consisted of 25 multiple-choice items which were converted into the Google Forms™, a free web-based survey administration software. The participants were required to take the online version of the test for 35 minutes by listening to the downloadable audio file attached to the Google Forms (Cronbach's $\alpha = .872$). The results revealed the homogeneity of the two groups in terms of their variances on the pretest ($F = .334$, $p > .05$). After ensuring about the participants' homogeneity, they were randomly assigned into two experimental groups ($n1 = 34$ & $n2 = 31$).

Three times a week, for about four weeks, on Google Meet platform, the technology-assisted group received mobile-mediated instructions to English words pronunciation through a cellphone free application *Longman Advanced American Dictionary (LAAD)*, while the teacher-directed group received similar English words pronunciation instructed by the researcher. Immediately after the treatment sessions, the participants in both groups took part in a virtual version of Preliminary English Test: Listening sample Paper 2, as the posttest (Cronbach's $\alpha = .872$). Finally, there was a follow-up virtual one-on-one interview with the researcher on Google Meet. The researcher in this study was a TEFL university professor who had been teaching various EFL courses for almost 20 years. After collecting the data, the researcher with the help of three other experienced TEFL university professors started analysing the content of the recorded interviews, ensuring inter-rater reliability of the findings.

Instruments

Different instruments were used in this mixed methods research.

Preliminary English Test (PET): Pretest and Posttest

Due to the importance of having homogeneous participants, the researcher converted a virtual version of Preliminary English Test: Listening sample Paper 1 into the Google Forms, then it was administered as a 35-minute pretest. In the same way, after the 10 treatment sessions, the virtual version of Preliminary English Test: Listening sample Paper 2 was used as the immediate posttest to assess the participants' improvement in their achievement.

To address concerns about test validity in an online setting, several measures were taken. First, students were informed that the pretest was for research purposes only and would not affect their grades. This was done to reduce anxiety and encourage honest participation. Additionally, while specific software for monitoring test-taking was not employed, the focus on the pretest as a non-evaluative tool aimed to minimize the incentive for cheating.

Google Meet™ Application

Google Meet™ (formerly known as Hangouts Meet™) is a secure video conferencing service developed by Google by means of which a Google Account can register and sign up to an online meeting with up to 100 participants (https://apps.google.com/;

https://en.wikipedia.org/). Google Meet was developed to let dozens of people join a virtual meeting, and speak or share videos, or photos with each other from anywhere with internet access (Steven, 2020). Meet can make a quick and easy way to connect with your students via live video. Teachers can use it to do instruction and to hold group discussions or group work. It helps students see each other's faces and feel that they are in a real class. In other words, this free computer-mediated application allows many individuals to join the equivalent virtual meeting, and talk or offer video with one another from anyplace in the world (Steven, 2020). There were two reasons for the researcher to select Google Meet platform. The first main reason was its two-way and multi-way audio and video calls with a resolution up to 720p. Next, it was a modern application suitable to be used in computers, laptops, Android, and also IOS systems.

Longman Advanced American Dictionary™ (LAAD) Mobile Application

Longman Advanced American Dictionary™ (LAAD) is a free mobile phone application which was used as the mobile-mediated material in the present study. Using LAAD reveals that American pronunciation was specifically used in the present study. LAAD not only allows its users to listen to the American native speaker's aural pronunciation of the words, but it also provides them with the opportunity to record their own voice and compare it to the native speaker's. LAAD is the application, which was used by the participants in the experimental group 1 in this study as the technology-mediated words pronunciation modality of instruction. At the outset of the treatment session of the experimental (Technology-mediated) group 1, the introduction to the ten new words was presented on the Google Meet platform. The participants were required to use LAAD for further practice and self-assessing their accurate pronunciation. They were able to discriminate their own pronunciation with the native-like pronunciation of the words provided by LAAD.

Self-Evaluation Interview

After the 10 intervention sessions and the posttest, the procedure of data collection was extended to a self-evaluation structured interview with 30 of the participants (experimental 1 = 15, experimental 2 = 15) on Google Meet platform. There were two interview questions for each group asking the participants' opinions about 1) teaching modality in both groups (i.e. LAAD in the technology-assisted group, and the teacher instruction in the teacher-directed group), and 2) Google Meet CMC platform. Participants' comments were all recorded and transcribed for the future coding and content analysis.

To ensure the interview questions were both reliable and valid, they were reviewed by three TEFL experts. These experts assessed the questions for clarity, potential bias, and their ability to elicit the desired information. Based on their feedback, minor adjustments were made to the wording of certain questions to enhance understanding and ensure consistency across interviews, thus strengthening both the reliability and validity of the data collected.

Procedures

Sixty-five non-English major EFL university learners within the age range of 18-35 years were selected through convenience sampling and their performance on the Preliminary English Test: Listening sample Paper 1. The selected participants were randomly assigned into two groups of experimental 1 (n = 34) and experimental 2 (n = 31). Registered and signed up to the platform of Google Meet, the participants in experimental group 1 were supposed to use LAAD to acquire words pronunciation; while students in the experimental group 2 were supposed to acquire words pronunciation by means of the teacher-directed instructions, on Google Meet platform. Both experimental groups participated in ten 90-minute morning classes of general English. A pool of one hundred and thirty words was selected from the learners' textbook *Select Readings: Intermediate* (Lee & Bernard, 2011). This sampling was conducted based on the index of familiarity and the researcher's record of frequent problematic words pronunciation to Persian-speaking EFL learners. Then, the selected words were piloted with a group similar to the target sample in order to ensure the minimum prior exposure of the participants and fairness. As a result, 100 unfamiliar words were selected and divided into 10 sets (K = 10) to be distributed as the part of the instructional materials in 10 successive sessions of 90 minutes.

In a briefing session, the researcher provided the participants with a Google Meet code for entering the class sessions and helped the participants, in both experimental groups, to gain access to Google Meet activities such as turning the microphones/videos on or off, changing screen layout, and the like. Two different paths were taken by the experimental groups 1 and 2 in Google Meet platform:

A. In the experimental group 1 (technology-assisted group), after joining a Google Meet session, the teacher presented ten new words on the screen. The participants had to use LAAD on their mobile phones in order to check the phonetic transcription and also listen to the accurate pronunciation of the given words. After enough rehearsal, they had to record their own pronunciation and compare it to its accurate pronunciation on LAAD. Google Meet platform enabled the teacher to monitor the learners' activities all through the session.

B. In the experimental group 2 (teacher-directed group), it was the teacher who was responsible for teaching the words pronunciation through Google Meet platform. That is, after joining a Google Meet session, the teacher presented each new word and its transcription on the screen. Then, the teacher started teaching the pronunciation of each word using its transcription. Students were supposed to pay close attention to the transcription and also teacher's explanation and pronunciation. After teaching each word, the teacher asked students to pronounce the word chorally and then individually, while paying close attention to the transcription. The teacher carefully monitored the learners' rehearsal and assisted them to correct their mispronunciations. During Google Meet online classes, the teacher and students could not only observe the presented words, but they could also see one another and listen to each other's pronunciation. They could even give some hints to their friends.

In order not to have any interference between the general English course material teaching and the intervention, the researcher split the 20 sessions of the whole course into two equal halves, namely, the first half was used to complete the treatment and the second one was used to cover the regular instruction for general English course material.

Immediately after the treatment sessions, the participants in both groups took part in a virtual version of Preliminary English Test: Listening sample Paper 2, as the posttest (Cronbach's α = .872). Finally, the participants joined a virtual interview with the researcher on Google Meet to express their perceptions of learning experience in this study by answering the two interview prompts. The interviews were recorded and transcribed for coding and content analysis by the researcher and three other TEFL experts. Occasional disagreements among the raters were resolved case-wise to reach a full consensus, ensuring inter-rater reliability of the findings.

Data Analysis

To address the impact of teaching modality on the participants' listening achievement in each group, means on the pretest and posttest were compared by running a paired-samples t-test. Additionally, an independent-samples t-test was run to compare the two groups' average performance on the posttest in order to probe the third research question. Finally, the responses to the interview questions regarding the participants' opinion about teaching modality and also their experience in Google Meet were audio-recorded, transcribed, and analyzed by the researcher, following Dörnyei's (2007) qualitative research analysis and report. That is, after collecting and transcribing data, preliminary codes were assigned to the content of responses, before extracting the key patterns or themes in each code and summarizing them.

FINDINGS

Preliminary Investigation

Since the normality of the data is the core assumption of the statistical tests, it was probed using skewness and kurtosis indices and their ratios over the standard errors (Table 1).

Table 1
Descriptive statistics: Testing normality of data

Group		N Statistic	Skewness			Kurtosis		
			Statistic	Std. Error	Ratio	Statistic	Std. Error	Ratio
Teacher-directed Experimental	Pretest	31	-0.49	0.42	-1.17	-1.00	0.82	-0.12
	Posttest	31	0.37	0.42	0.88	0.05	0.82	0..07
Technology-assisted Experimental	Pretest	34	-0.23	0.40	-0.59	-0.72	0.78	-0.92
	Posttest	34	-0.35	0.40	-0.88	-0.95	0.78	-1.22

Since the computed ratios of skewness and kurtosis were lower than +/- 1.96, it was concluded that the normality assumption of the collected data was retained (Field, 2018).

An independent-samples t-test was run to compare the teacher-directed and technology-assisted experimental groups' means on the pretest in order to prove that the two groups were homogenous in terms of their initial listening ability prior to the administration of the treatment. Table 2 displays the results of the descriptive statistics for the two groups on pretest. The results indicated that the teacher-directed (M = 26.32, SD = 7.73) and technology-assisted (M = 26.41, SD = 8.56) groups had almost the same mean scores on the pretest.

Table 2
Descriptive statistics: Pretest score by both groups

	Group	N	Mean	Std. Deviation	Std. Error Mean
Pretest	Teacher-Directed	31	26.32	7.73	1.39
	Technology-Assisted	34	26.41	8.56	1.46

Table 3 displays the results of the independent-samples t-test. As displayed in Table 3, the non-significant results of the Levene's test (F = .334, p > .05) indicated that the two groups were homogenous in terms of their variances on the pretest.

Table 3
Independent-samples t-test: Pretest scores by both groups

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	T	d.f	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	0.33	0.56	0.04	63	0.96	0.08	2.03	-3.97	4.15
Equal variances not assumed			0.04	62.99	0.96	0.08	2.02	-3.95	4.13

The results of independent samples t-test (t (63) = .044, p > .05, r[1] = .006, representing a weak effect size) indicated that there was not any significant difference between the two experimental groups' mean scores on the pretest. Thus, it can be concluded that the teacher-directed and technology-assisted groups were homogeneous in terms of their listening ability prior to the administration of the treatment.

[1] The r-effect size should be interpreted based on these criteria; .10 = Weak, .30 = Moderate, and .50 = Large (Field 2018).

The Impact of Teacher-Directed Pronunciation Instruction

To examine the first research question, regarding the impact of teacher-directed pronunciation instruction on the participants' listening achievement, the teacher-directed experimental group means on the pretest and posttest were compared by running a paired-samples t-test.

Table 4
Descriptive statistics: Pretest and posttest teacher-directed experimental group

	Mean	N	Std. Deviation	Std. Error Mean
Pretest	26.32	31	7.73	1.39
Posttest	36.48	31	7.45	1.33

Table 4 displays the descriptive statistics for the pretest and posttest scores. Based on the results, it can be claimed that the teacher-directed group had a better performance and a higher mean on the posttest (M = 36.48, SD = 7.45) than the pretest (M = 26.32, SD = 7.73).

Table 5
Paired-samples t-test: Pretest and posttest of teacher-directed experimental group

Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
10.16	9.44	1.69	5.98	30	0.000

The results of the paired-samples t-test (t (30) = 5.98, $p < .05$, r = .738 representing a large effect size) (Table 5) indicated that the teacher-directed instruction group had a meaningful improvement in their listening ability as the result of receiving teacher-directed instructions.

The Impact of Technology-Assisted Pronunciation Instruction

The technology-assisted experimental group means on the pretest and the posttest were compared using another paired-samples t-test in order to probe the impact of technology-assisted instruction on the participants' listening achievement in Google Meet online platform.

Table 6
Descriptive statistics: Pretest and posttest of technology-assisted experimental group

	Mean	N	Std. Deviation	Std. Error Mean
Pretest	26.41	34	8.56	1.46
Posttest	31.41	34	8.73	1.49

Table 6 displays the descriptive statistics for the pretest and posttest scores. Based on the results, it can be claimed that the technology-assisted experimental group had higher mean on the posttest (M = 31.41, SD = 8.73) than the pretest (M = 26.41, SD = 8.85).

Table 7
Paired-samples t-test: Pretest and posttest of technology-assisted experimental group

Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
5.00	2.75	0.47	10.59	33	0.000

The results of the paired-samples t-test (t (33) = 10.59, p < .05, r = .879, representing a large effect size) in Table 7 indicate that the technology-assisted experimental group had a significantly higher mean on the posttest than the pretest as a sign of their progress.

The Comparative Impact of Teacher-Directed and Technology-Assisted Instructions

An independent-samples t-test was run to compare the teacher-directed and technology-assisted experimental groups' average performance on the posttest in order to probe the third research question. Table 8 displays the results of the descriptive statistics for the two groups on the posttest. The results indicated that the teacher-directed group (M = 36.48, SD = 7.45) had a higher mean than the technology-assisted group (M = 31.41, SD = 8.73) on the posttest.

Table 8
Descriptive statistics: Posttest performance by teacher-directed and technology- assisted experimental groups

	Group	N	Mean	Std. Deviation	Std. Error Mean
Posttest	Technology-Assisted	34	31.41	8.73	1.49
	Teacher-Directed	31	36.48	7.45	1.33

Table 9 displays the results of the independent-samples t-test. As illustrated in Table 9, the non-significant results of the Levene's test (F = 1.64, p > .05) indicated that the two groups were homogenous in terms of their variances on the posttest. That was the reason behind reading the first row of Table 9, in which the "Equal variances assumed" was reported.

Table 9
Independent-samples t-test: Posttest comparison for teacher-directed and technology-assisted experimental groups

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	d.f	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	1.64	0.20	2.50	63	0.01	5.07	2.02	1.02	9.11
Equal variances not assumed			2.52	62.73	0.01	5.07	2.00	1.05	9.08

The results of independent samples t-test (t (63) = 2.50, p < .05, r = .30, representing a moderate effect size) indicated that the teacher-directed instruction enabled the participants to significantly outperform the technology-assisted group on the posttest.

Qualitative Findings of the Study

The qualitative research question was raised to provide the researcher with the participants' evaluation of two crucial aspects in this study, namely, the impact of instruction types (teacher-directed vs. technology-assisted), and also Google Meet online platform. The responses to the questions were audio-recorded and transcribed by the researcher. Following Dörnyei's (2007) qualitative research analysis and report, the content analysis of the collected data was done by the researcher and three TEFL experts to ensure inter-reliability of the findings. That is, after collecting and transcribing data, preliminary codes were assigned to the content of responses, before extracting the key patterns or themes in each code and summarizing them.

The first prompt probed participants' opinion about 'the effectiveness of LAAD' (in technology-assisted group) and 'teacher instruction' (in teacher-directed group) in acquiring accurate pronunciation. In technology-assisted group, the extracted themes for Prompt 1 included the participants' references to *the usefulness of LAAD* for having access to native English pronunciation and phonetic transcription (N = 34), and also self-assessment and -monitoring (N = 22). Participants in this group asserted their satisfaction with having access to Native American pronunciation and stated that listening and imitating native pronunciation had a positive impact on learning correct pronunciation. Moreover, they believed that having access to both phonetic transcription and native speaker's aural pronunciation at the same time could help them use their aural and visual memory to learn the correct pronunciation (Martinez & Lee, 2024; Metruk, 2024; Nursyafida and Putri, 2025). The second extracted theme was the ability of LAAD to equip participants to self-assess and self-monitor their pronunciation acquisition. Participants indicated that the ability to record their pronunciation provided them with an opportunity to compare their own pronunciation to the native speaker's. In this way, they could listen to both voices and find the problem with their own pronunciation (Abdel Latif , 2024; Al-Kamzari & Alias, 2024; Metruk, 2024). The elicited key words were *effective, useful* and *influential*.

The extracted themes for Prompt 1, in the teacher-directed group, addressed *the positive impact of a teacher* with attributes of motivation (N = 30) and teacher feedback (N = 25). The majority of the participants believed in the importance of teacher's encouragement and help in learning phonetic symbols and their aural production. Moreover, they perceived teacher's direct or indirect encouragement as a kind of positive motivation, without which they might have got bored or lost their eagerness to continue (Aziz & Kazi, 2019; Yasmin & Islam, 2018). On the other hand, they demonstrated their satisfaction with teacher's feedback in the process of acquisition. They believed that without teacher's explanation and emphasis on special points, it was difficult for them not only to focus on details but also to recognize their pronunciation problems(Abdel Latif , 2024; Altun & Ahmad, 2021). The elicited keywords were *encouragement, attention,* and *help.*

The elicited themes for Prompt 2 addressed *the effectiveness of Google Meet platform* with attributes of face-to-face interaction (N = 50) and user-friendly (N = 26). Participants' major argument revealed that face-to-face interaction made them feel to be

in a real classroom; because not only could they see each other, but the teacher could also watch them and have control over their activities (Steven, 2020). Moreover, most of the participants came to the consensus that Google Meet created an engaging and comfortable environment for their learning experience. By comparing Google Meet to other popular online platforms such as Skype™ or Zoom™, they confirmed Meet's better accessibility and user-friendliness (Steven, 2020). The elicited key words were *user-friendly* and *real classroom*.

DISCUSSION

The present study investigated the comparative impact of teacher-directed and technology-assisted words pronunciation instruction on EFL learners' listening achievement on Google Meet™ CMC platform.

The first research question in the present study addressed the probable effect of teacher-directed pronunciation instruction on EFL students' listening achievement on Google Meet online platform. The findings revealed that the teacher-directed instructions on CMC platform caused meaningful improvement in the participants' listening performance. The improvement of learners' performance in teacher-directed group might be connected to the roles that an L2 teacher can play in a physical classroom or CMC platform, such as facilitator, advisor, counselor, organizer, controller, resource, tutor, motivator, supporter, stimulator (Aziz & Kazi, 2019; Yasmin & Islam, 2018). Moreover, teacher's direct feedback and ability to modify the instruction immediately might have led to more instant corrections and a more personalized learning experience. The instant feedback and personalized correction in a teacher-directed group might be specifically effective for learning pronunciation, where delicate distinctions are crucial (Chune, 2016; Razali & Husna, 2018). Additionally, the organized and sequential approach often used in teacher-directed instruction could provide a clearer path for students to follow. That is, teachers can adjust the pace and concentrate on the students' individual needs (Peterson, 2021). Furthermore, while technology-assisted instructions offer flexibility, they may lack the immediate interaction and adaptability of a teacher, which is crucial for mastering pronunciation (Chen, 2020).

In line with the findings in the present study, Sakale (2019) who reported the positive influence of L2 teachers on acquisition of language pronunciation proposed that this impact was not only by means of teachers' oral instructions, but also by their paralinguistic features including mouthing the sounds, modeling intonations, and raising awareness. Moreover, Liu and Fu (2011) in their experimental study on Chinese foreign language learners reported the impact of teachers' instruction on improving learners' accurate pronunciation of English. Bouchhioua (2017) also reported the significant effect of teacher's explicit pronunciation instruction on EFL learners' comprehensibility and intelligibility.

The second research question aimed at exploring the possible effect of technology-assisted pronunciation instructions on EFL learners' listening achievement on Google Meet online platform. The findings proved that technology-assisted instructions caused meaningful improvement in students listening achievement on CMC platform. This was most probably because technology-assisted instruction allows learners to self-regulate,

self-monitor and self-assess their own learning processes, even on a CMC platform. It also forces learners to pay more careful attention to details that can indirectly cause the enhancement of their autonomy (Hazaea & Alzubi, 2018). In the same vein, Balderas and Cuamatzi (2018) believed that self-assessment and self-correction can develop learners' awareness about their errors, allowing them to correct the errors themselves and become responsible for their learning. Metruk (2024) also believed that technology-assisted learning can be really motivating because it can provide learners with a new and exciting way of acquiring knowledge. As a result, technology-assisted instruction, in both physical classroom and CMC platform, can not only enhance learning and autonomy, but it can also make learning more interesting and enjoyable. There are several studies reporting the positive effect of using technology-assisted instructions on pronunciation acquisition. For example, Hamad and Muhammad (2018) carried out a research to assess the impact of employing Praat software on EAP university students' stress and intonation acquisition and reported satisfactory results. Furthermore, Arashnia and Shahrokhi (2016) investigated the impact of using English File Pronunciation™ mobile application in foreign language education and reported its positive effect on learning English words pronunciation. The findings of Hişmanoğlu's (2012) study also revealed the positive effect of technology-assisted pronunciation lessons on Turkish learners' accurate production of English. Abdel Latif (2024) also studied the effect of using mobile application on the students' oral skills (listening and speaking) and revealed its positive impact. Nursyafida and Putri (2025) also conducted a review research focusing on studies that involved the use of technology in teaching and learning pronunciation from beginner to proficiency level. They came to the conclusion that using technological devices can be effective because they can "provide immediate feedback, support individualized practice, and accommodate learners' diverse needs across segmental and suprasegmental pronunciation features" (p. 431). Contrary to the findings in the present study, Liu (2008) examined the effect of Pronunciation Power 2, which is a digital language learning program, on ESL learners in America and reported no significant improvement in their pronunciation achievement.

The third research question attempted to explore the extent to which teacher-directed and technology-assisted pronunciation instructions would make any different impacts on learners' listening achievement on Google Meet online platform. The findings provided adequate evidence that the teacher-directed pronunciation instructions enabled the participants to significantly outperform the learners in the technology-assisted group. While previous studies have often revealed the benefits of technology-assisted pronunciation instruction, this research indicates that teacher-directed instruction was more effective within the Google Meet platform. This could be due to different reasons.

1. The features of the CMC platform used in this study (Google Meet) might have facilitated the instant feedback and interactive nature of teacher-directed instruction, specifically in teaching accurate pronunciation (Godzicki, et al., 2013; Steven, 2020).

2. The guidance from the teacher might have provided a more direct and personalized learning experience, compared to the potentially less interactive nature of technology-assisted instructions. Teachers' immediate and personalized adjustments can be more

effective in addressing individual student challenges, especially with pronunciation (Chune, 2016; Razali & Husna, 2018).

3. Teacher's positive emotional connection might have also created a more comfortable learning environment. In fact, teacher's support, feedback, encouragement, enthusiasm, personal connection and rapport can make a big difference, especially in learning something difficult such as pronunciation. Teacher's emotional connection can create a more supportive and encouraging atmosphere, which can boost students' confidence and willingness to practice (Aziz & Kazi, 2019; Bouchhioua, 2017).

4. The last, but the most important factor might be that participants in the teacher-directed group benefited from a integration of learning and teaching strategies; that is, integration of advantages of both teacher-directed instruction and also virtual environment of Google Meet platform. In other words, teacher-directed pronunciation instruction on CMC platform might have caused participants to benefit from not only the teacher's expertise, guidance, feedback, support, and personalized teaching (Aziz & Kazi, 2019; Sakale, 2019; Yasmin & Islam, 2018), but also a virtual environment which could be motivating, engaging, interactive, and interesting for them (Abdel Latif, 2024; Nursyafida and Putri, 2025; Steven, 2020). Such conditions might reinforce and optimize learning outcomes.

In line with the findings in the present study, Chen (2014) conducted a research with Taiwanese college students to investigate the impact of My ET software for teaching pronunciation in and out of the classroom. The findings indicated that implementing My ET software was effective in participants' pronunciation progress, yet most of the participants showed their preference to use this software in classroom environment under the supervision of a teacher. Contrary to the present study, Mahdi (2018) conducted a research to compare the effect of traditional and Computer-Assisted Keyword Technique on acquiring the pronunciation of English weak forms. Weak form is unstressed pronounced word in an utterance, for example, the weak forms of the word 'and' is /ənd/ (Mahdi, 2018). The findings did not show any significant difference between the computer-assisted keyword and traditional keyword groups, although the scores of the students in the computer-assisted group were slightly higher.

The discussion of the last research question which quarried the degree of engagement of the participants in instruction modality and Google Meet platform is contingent on the analytical results of the structured interview. The participants' general approvals and satisfaction of instruction modality and Google Meet platform were consistent with the findings by Godzicki, et al. (2013), Peregoy and Boyle (2012), Sakale (2019), Aziz and Kazi (2018). Conducting a research, Godzicki, et al. (2013) surveyed the impact of technology on students' motivation and engagement and revealed its upheaving role. Similarly, Peregoy and Boyle (2012) investigated the advantages of using the internet and reported that it provided a favorable language learning environment for students and facilitated their learning progress. On the other hand, Sakale (2019) investigated and revealed the pivotal role of teachers' feedback on learners' language pronunciation. The qualitative part of Sakale's (2019) study also revealed participants' approval and satisfaction with many teachers' roles, especially teacher's feedback. Furthermore, Aziz

and Kazi (2018) also investigated the impact of teachers' role in learners' classroom participation. In the qualitative part of their study, they probed participants' evaluation of the teacher's role. Majority of the participants believed in the supportive role of the teachers, as facilitator, supporter, and guide.

CONCLUSION

Considering the importance of pronunciation acquisition in oral communication and intelligibility, the crucial role of teachers in L2 acquisition, widespread use of technological devices in today's L2 acquisition, and also the necessity of using virtual environment in the educational system on special occasions, such as the global pandemic caused by COVID-19, the present study has shed some new light on the unexplored issue of comparative impact of teacher-directed and technology-assisted pronunciation instructions on EFL learners' listening achievement on Google Meet™ CMC platform.

The present study revealed the superiority of teacher-directed over technology-assisted pronunciation instruction on a CMC platform. It implies although learners in the 21st century are called digital natives, it does not necessarily mean that they are born to know how to learn a foreign language effectively with these technological devices. They still need an instructor to introduce them to different strategies necessary for effective learning (Zhou & Wei, 2018). It is also plausible for teachers and learners to be aware of teachers' crucial role in teaching pronunciation in both physical classroom and CMC platform, as they can provide learners with support, encouragement, feedback, help, and motivation, which are necessary for a successful learning. Employing a variety of roles, teachers can specifically make learning pronunciation more dynamic (Aziz & Kazi, 2019; Razali & Husna, 2018). By modelling accurate pronunciation, teachers provide clear examples for students to follow. Using diverse techniques, teachers can also make pronunciation learning easy and clear for their students. Teachers can also create a relaxed and supportive environment to motivate students to participate actively in pronunciation practices. (Aziz & Kazi, 2019; Derwing & Munro, 2015; Sakale, 2019). Moreover, from a sociocultural perspective, the presence of the language teachers in the classroom environment was found, in this study, as one of the major factors in meaningful improvement of students' achievement even on an online platform. In fact, through such collaboration with more skilled persons, especially teachers, even on a CMC platform, learners can learn and internalize new concepts and skills more easily. Furthermore, the present study also revealed the positive effect of the integration of strategies in teaching and learning pronunciation. That is, by providing students with teacher-directed pronunciation instruction on CMC platform, teachers could help them benefit from both teacher's expertise, guidance, feedback, support, and personalized teaching (Aziz & Kazi, 2019; Sakale, 2019; Yasmin & Islam, 2018), and also a virtual environment which could be motivating, engaging, interactive, and interesting for them (Abdel Latif, 2024; Nursyafida and Putri, 2025; Steven, 2020).

Finally, no research is devoid of limitations, and this study was not an exception. The participants' gender, educational background, and some other personal features were

not taken into consideration in this study, which might have changed the results and may provide areas for further research. Next, online teaching has its own problems. There are always some disconnections of the internet or low connections which could affect learners' performance and also indirect impacts on the results of the present study. Future research can compensate such infrastructure factors and raise the internal validity of the research findings. Moreover, due to the use of convenience sample from one university, the results may not be applicable to all student populations. Replicating this study with a greater population from different universities could provide more comprehensive insights.

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