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Interplay Between Pronunciation-focused Corrective Feedback and Online Educational Synchronic Software in an ESP Course

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Abstract

The affordances of technological devices for L2 teaching and computer-mediated communication (CMC) effect for all corrective feedback types in itself has drawn attention in the literature. However, there is a paucity of research to address the interplay between pronunciation, word stress, rhythm and intonation generated corrective feedback and educational synchronic software involved in ESP courses. In order to bridge the gap in this investigation, framed in a quasi-experimental design, the researchers selected 60 participants registered in guidance and counseling course in Islamic Azad University in a northern branch through convenience sampling design. They were randomly assigned into experimental/intervention & control group (n=30) in each group. In the control group, however, the lecturer corrected the students' mistakes in respect to segmental and suprasegmental pronunciation traits. In the experimental group, the software (App) detected the students' segmental and suprasegmental mistake and it gave them a chance to correct themselves. The software was designed in such way that the participants had to pronounce the given content and they pronounced a word or a sentence several times in order to pronounce it accurately. The MANCOVA was utilized to analyze the data. Findings showed that providing online generated feedback by online educational synchronic Application in the experimental group could develop the ESP learners' suprasegmental instructional targets (especially 'Word stress' (p = .01), 'Intonation' (p = .000), and *segmental instructional target i.e., '*pronunciation ' (p = .004), but not 'Rhythm' (p = .14, p > .05) significantly. The present study has some ramification for ESP instructors to find innovative ways i.e. the use of online educational synchronic to develop students' pronunciation skill, especially suprasegmental.

Keywords: ESP Course, Intonation, Online Educational Synchronic Software, Pronunciation-focused Corrective Feedback, Rhyme, Pronunciation, Stress

1. Introduction

The ever-increasing interest in the development of foreign or second (L2) oral skills in a computer-mediated communication class has given rise to a large proportion of studies on the direct and indirect effect of CMC interventions on second or foreign language acquisition (Pennington & Rogerson-Revell, 2019; Wallace & Lima, 2018).

Coincided with COVID-19 emergence and the necessity of the pedagogical shift integrated in technological tools, a response to the necessity and significance of corrective feedback became more dominant than before not exclusively to instructors but also to researchers (Aghaei, et.al, 2022). More precisely, with the advent of a pedagogical CMC-integrated shift, Corrective Feedback or a response to a wide range of errors associated with linguistic and its subcomponents, content, organizing, and even discourse and pragmatic competence errors (Minh, et.al 2019; Yousefi &

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Nassaji 2019) is expected to become an inherent part of educational process, especially in ESP courses as an unaddressed area. Corrective Feedback, as Zhao (2015) defines, alludes to comments given to the students reflecting that their outputs are erroneous. Chaudron (1988) characterized CF as any [instructor] conduct following an error that slightly endeavors to educate the student regarding error reality.This behavior may overtly elicit a response from the learners and hence may result in self-correction or may correct the learners' error in ways that they may not realize that a response is needed. Albeit corrective feedback is viewed as a significant part of second language (L2) teaching methodology, there still exist some studies with controversial results on its role and effectiveness in both L2 instruction and acquisition (e.g., Mao & Crosthwaite, 2019; Shintani & Ellis, 2013).

Framed in various theoretical and pedagogical perspectives, most empirical studies have so far contended that corrective feedback as an essential part in linguistic knowledge enhancement (Ellis, 2009) or even a redundant task in L2 knowledge acquisition (e.g., Mao & Crosthwaite, 2019). In spite of contradictory results, their focuses were not only on issues related to whether corrective feedback assists language acquisition (Lyster & Ranta, 2013) but also the diverse effects of different types of feedback (Brown 2016) and the effectiveness mechanisms (Fenesi, et.al 2014) in a variety of ES/FL settings. Furthermore, a number of other key issues such as the frequency of error correction, responding efficacy to errors by learners (Vasquez & Harvey, 2010), peer feedback roles (Deiglmayr, 2018; Holewik, 2020; Noroozi & Hatami, 2019), learners' and teachers' perspectives (Chen & Liu, 2021; Shirkhani & Tajeddin, 2017; Nassaji, & Kartchava 2017), optimal conditions for corrective feedback provision (Sarré et.al, 2019) and the various individual differences of learners (Tadayonifar, et.al, 2020) have so far been addressed in the literature.

The affordances offered by technological devices for L2 teaching and computer-mediated communication (CMC) effect for all corrective feedback types in itself or in comparison with traditional face-to-face (F2 F) instruction during the pandemic has drawn attention in the literature (see, for example, Jiang, Yu, and Zhao, 2021; Tsao, 2021; Zou & Kong, 2021; Yu, 2021). However, there is no study to be delved into the interplay between pronunciation, word stress, rhythm and intonation generated corrective feedback and educational synchronic soft wares involved in English for specific courses. Such ignorance may boost the "marginalized" nature of pronunciation in EFL pedagogical settings (Lee, Plonsky & Saito, 2020) including ESP classes. It may be partly due to the fact that the interplay between the computer-mediated technology and L2 pronunciation-focused corrective feedback education does not enjoy a long history in ESP courses when there is an overemphasis on reading comprehension skill. Moreover, in the related literature, pronunciation subskill has been conceptualized as a monolithic rather than a multilayered construct. Indeed, such a conceptualization failed to provide separate awareness accounts on the intervention's effectiveness on its two instructional targets (segmental and suprasegmental). In order to bridge the gap, this study thus aimed to contribute to the burgeoning literature, exploring the interplay between pronunciation instruction (segmental and suprasegmental instructional targets) and CMC tool affordances i.e., one framed in an online educational synchronic software in an ESP course. In keeping with, the possible effectiveness of online segmental and suprasegmental pronunciation generated feedback altogether were focused.

Thus, it is important for ESP instructors to find some ways and approaches to develop students' pronunciation skill, especially suprasegmental besides segmental instructional target as an underrepresented area in the ESP literature more effectively in order to increase their pronunciation performances in ESP communication settings. All in all, the main objective of this study was to address the possible relationship between corrective feedback by online educational synchronic Application and pronunciation-oriented educational development (suprasegmental and segmental pedagogical objectives), especially in an ESP course.

2. Literature Review

2.1. Computer-mediated Communication (CMC) in Language Education Industry

So far, the inclusion of CMC tools in English courses has opened up new horizons for language learning, and due to the capabilities of this technology, the field of language teaching has undergone radical changes in its pedagogical practices. Students can participate in asynchronous time-delayed CMCs such as e-mail or real-time synchronous CMCs such as videoconferencing (Abrams, 2003).

As Abrams (2003) contends, asynchronous and synchronous CMC modes are of similarities and differences in many ways. They are of similarities in that they offer opportunities for collaborative learning, a greater number of results, the development of language skills and more speaking opportunities for each learner. Likewise, they are dissimilar as the synchronous modes necessitates immediate response. They often do not allow for external sources use. Rather, asynchronous mode allows for scheduled remote support time. In particular, asynchronous teaching takes place on a delayed basis and does not require the simultaneous participation of the students and teachers. (Branon & Essex, 2001). Interlocutors are simultaneously present because of the real-time nature of the synchronous mode despite a time lapse between the messages.

The literature has so far emphasized CMC benefits in achieving meeting objectives and has provided solutions to some pedagogical barriers. Some of CMC's affordances may be authentic material supplies (Blake, 2011), inaugurating a more interactive discourse and more positive collaborative learning context (Abrams, 2003), socialization opportunities with special discourse communities (Yang, 2014), creating a high participatory and rather free communication tools to express the voice of students (Kim, 2000).

Sykes (2005) also disputed that the CMC is an appreciated resource for undertaking certain hitches that are not easy to solve in traditional face-to-face educational contexts. It enables educational stakeholders to focus simultaneously on macro and micro level skills. It considers the personality features of the students and allows for more personalized and adjusted teaching. Some theoretical hypotheses have also been supported by the integration of computer technology into pedagogical interventions. Collaborative technology, as Yim and Warschauer (2017) discuss, can develop models and forms relevant to collaborative work, the transfer of literacy practices via innovative technological affordances. Interactions between individuals in the social environment can also stimulate cognitive development (Aghaei, at.al 2012). Nguyen (2008) supported that the CMC could be considered not only as a linguistic but also a technical tool for mediation, offering a wide range of affordances such as merging text, video and audio with hyperlinked and hypermedia traits to enable multidimensional modes of communication such as a single, one to one, one to many and also many to many.

2.2. CMC Integration and its Effects on L2 Pronunciation Development

Integrating technology to accelerate learning of language has grown rapidly in recent years. As a result, there is a great call for CMC produces, especially in ESP contexts. Computer-assisted pronunciation training, or CAPT as a field is also in its early development. CMC and CAPT have fundamental effects on language learning / teaching and education. Investigating their effectiveness is then of significance. Besides their educational values, some impacts are the recognizable availability of technology-oriented learning/ teaching tasks, including the driving consequence of innovation, multimodal resources encompassing printing, audio, and video, and their ubiquitous feature i.e., mobility to study anywhere and anytime (Aghaei et.al, 2020).

In other words, Technology was integrated in diverse ways in order to develop receptive knowledge giving rise to cultivate productive knowledge, or initiate the capability for producing various pronunciation models and patterns. Technology contributes to learners to identify the possible differences between the pronunciation of the target language and their own pronunciation in targeted and also extended speech. When listening to their voice recordings, learners are able to do a more in-depth analysis of their pronunciation and, as a result, to identify the opportunity they make to speak in real situation. This may give rise to better self-monitoring. When they are capable

of producing target language pronunciation, They can also propose unlimited possibilities to repeat and imitate, quick responses and also exposure to a variety of speeches and communications in the target language. CAPT also speeds up learning at learners' own pace (Wallace & Lima, 2018).

One main benefit of CAPT technology is the prospect of providing automated feedback; using voice technologies which can be mostly timely for the possible feedback it may reproduce on pronunciation. In fact, a large number of recent quasi-experimental studies have also been done to explain the discursive role of CF in the development of L2 pronunciation based on a number of some factors such as L2 student readiness (the occurrence/non-occurrence of explicit phonetic knowledge, perceptual awareness, conversational experience,), CF types including rearrangements and prompts, and educational goals such as segmental and suprasegmental ones. These pronunciation-oriented CFs are usually made by teachers, interlocutors and/or computer software whenever L2 students make pronunciation errors which belong to one or more on the above-mentioned dimensions; therefore, it is naturally viewed "production-based".

For instance, in isolated CF technique, such as explicit phonetic instruction, instructors may request students to read aloud the target sounds and train them on whether their pronunciation is sufficiently understandable and intelligible. In order to ensure the feedback accuracy, some instructors may also be reliant on computer-aided pronunciation learning devices (e.g., Hincks, 2003; Hincks and Edlund, 2009). CF can also be laid into practice as post-hoc comments by lecturers on the syllabic, prosodic, segmental accuracy on students' audio recordings as a main part for home assignments (e.g., Dlaska & Krekeler, 2013; Lord, 2008).

2.3. Empirical Studies on CMC Integration and Pronunciation-focused Corrective Feedback

Given the relatively inadequate research on pronunciation instructional methods, integrating technology has received significant attention lately. In general, speech analysis technology that realizes speech suprasegmental functions (e.g., intonation, stress, rhythm, etc.) has been taken into account due to its potentiality as a methodology for pronunciation education. Research on the CMC for speaking objectives, concentrating pronunciation, shows the growing interest of foreign language researchers and experts to study the superiority and feasibility of CMC over face-to-face interaction in an L2 context.

Blake et al. (2008), for example, stated that a CMC group had better performance than a face-to- face (F2F) group. Cucchiarini, Neri, & Strik, (2009) investigated a group of immigrants following Dutch CAPT, an ASR-based Computer Assisted Pronunciation Training (CAPT) system which could provide feedback on various Dutch speech sounds. The findings demonstrated that the ASR-based feedback have an influence on correcting the errors in the teaching. Tejedor-García et al. (2020) in their study also demonstrated a significant pronunciation improvement among those learners who applied the CAPT tool, and also a correlation between automatic CAPT assessment of users and human rater's assessment of post-tests. In the same vein, Pourhosein et al. (2020) investigated Iranian teachers' role in using CAPT in teaching pronunciation. In the mixed method, they used Pronunciation Power 2 (PP2). The findings of the quantitative and qualitative research represented significant pronunciation improvement among the learners receiving CAPT instruction. In another study, Bu et al. (2021) demonstrated how Pronunciation Teacher (PTeacher) and CAPT system can have an effect on the appropriate degrees of exaggerated corrective feedback on mispronunciations.

Furthermore, some other studies showed significantly better oral performance of the CMC group compared to the control group i.e. (F2F) (e.g. Abrams, 2003; AbuSeileek, 2007; Ahn, 2006; Chang, 2008; Chen, 2017; Huang & Hung, 2010; Kost, 2004; Li, 2008; Lord, 2008; Satar & Özdener, 2008; Payne & Whitney, 2002; Wang, 2010). On the contrary, other studies have reported conflicting results from CMC in the development of L2 oral proficiencies (e.g. Blake et al., 2008; Chang, 2008; Loewen and Erlam, 2006; Sanders, 2005).

Although the review of the research showed mixed and sometimes contradictory results, to date, most studies highlighted that pronunciation characteristics should be taught as the main goal in terms of the relative effect on the intelligibility of L2 speech. They put an emphasis on the communication-oriented traits i.e. segmental traits which have a higher functional load in prosody. Notably, the possibilities offered by technological tools for L2 teaching and the effectiveness of CMC for various types of CF, compared to traditional face-to-face teaching, were explored in the literature. More empirical evidence supporting the pedagogical effectiveness of the possible interaction between computer-assisted technology and pronunciation-oriented educational development (suprasegmental and segmental pedagogical objectives) remains scarce especially in an ESP course. In so doing, this study seeks to answer the following research question:

Research Question: Is there any significant relationship between corrective feedback by online educational synchronic Application and ESP learners' segmental and suprasegmental instructional targets?

3. Methodology

3.1. Design and Participants

This study is regarded as a quantitative quasi-experimental study. The participants of this study were 64 undergraduate counseling students of both genders with the age range of 18 to 21 who studied in Islamic Azad university in a northern branch, in Golestan Province. The study participants were selected based on convenience sampling because the researchers could not administer any homogeneity test or choose the participants randomly. They had passed their general English course prior to the study. Only 4 students had an experience of learning English in language institutes from 2 to 4 years who were excluded in this study. Their mother tongues were mostly Persian.

The course was designed to follow a counseling ESP course book entitled *English for the students of Guidance & Counselling* by Mansour Koosha (2020, Samt Publication). Although the textbook was to develop students' reading comprehension and translation skills, the lecturer also put an emphasis on communicative practice i.e. fluency and accuracy as the main agenda for the study.

3.2. Instruments

In this study, the researchers designed and employed the pronunciation-focused tests as the pretest and the posttest. In classroom settings, ESP pronunciation proficiency-focused tests examine different following dimensions in students' sound production:

1. Pronunciation (Segmental) accuracy: Evaluating so-called native-like L2 segments in contrast with producing interlanguage forms (L1 and L2 mixture forms) or mother tongue counterparts
2. Word stress accuracy: Evaluating target-like word stress as compared and contrasted with pronouncing stressed syllables with higher longer and/or louder pitch
3. Intonation accuracy: Evaluating L2 satisfactory intonational cues, on the basis of falling and rising tones at the boundaries of the sentences
4. Rhythm Accuracy: Evaluating appropriate playing a rhythmic pattern of L2 exactly

3.2.1. Pronunciation Segmental Test

This test consisted of 50 words that were selected from the textbook. This test was given to participants of both groups before and after the treatment as the pretest and the posttest. Each participant was asked to read the given words loudly and then the lecturer recorded voices. She then scored participants' pronunciation. Each item had 2 scores and the score of this test was out of 100.

3.2.2. Word Stress Test

This part of evaluation was used to measure the learners' knowledge on word stress pattern. The researcher asked the participants to do the pronunciation test, lexical section, designed by the researchers including production sections. The production sections were recorded and thereafter evaluated either incorrect or correct by three researchers as experts in English language teaching, whose ideas were concurrent on the pronunciation skills of the participants. The obtained inter-rater reliability was 0.91, reflecting a strong agreement between the three raters.

3.2.3. Intonation Test

An identification test was also designed to not only measure participants' ability to perceive raising and falling tones in English Wh questions but also identify the correct grammatical function of tone in such a context (Wells, 2006). The test consisted of 10 stimuli in its practical phase. Taken from the textbook, forty Wh questions with adjusted raising intonation, forty Wh questions with falling intonation and also 5 polar questions as distractors were incorporated in this test.

3.2.4. Rhythm Test

A pretest of the rhythm of sentences (including a list of 20 sentences from the textbook which was planned to be read aloud by the students) was selected to be administered to the learners in both groups at the early stage of the experiment. The main goal was to ensure parity of students when using the English speech rhythm before the experiment started. Two reviewers, one of the researchers and a co-reviewer who was a university colleague, assessed the students' pace, and the test scores' inter-rater reliability was measured by using the Pearson correlation formula (r=0.85) and the validity was also determined by expert judgment.

A post-test, similar to the pretest, was also administered to the two groups during the final session in the course. The purpose of the post-test was to investigate to what extent the students' ability to use the English rhythm had improved (if existing) in the two groups. As done for the pre-test, the inter-rater reliability of the test results was measured by Pearson correlation formula (r = 0.91) and the validity of the test was determined by the experts' judgment as well.

3.3. Procedure

In this study, one of the researchers as the main teacher provide feedback on the segmental and suprasegmental pronunciation traits of the students. In so doing, 60 ESP learners in two classes whose field of study was guidance and counseling were selected through convenience sampling design. indeed, the participants were assigned into two groups; the control group (n=30) and the experimental group (n=30). Notably, one of the researchers with ph.d. degree was the lecturer in the ESP course with more than 10 years teaching experience in public universities and Islamic Azad universities. Within 10 sessions, the lecturer in the control group corrected the students' mistakes in respect to segmental and suprasegmental pronunciation traits whereas in the experimental group, the software as online educational synchronic Application detected the students' segmental and suprasegmental mistakes and it gave them a chance to correct themselves. Then, the pronunciation-focused tests including pronunciation segmental, word stress, intonation and rhythm test as the pretest and the posttest were administered to determine the pronunciation effectiveness.

The software was designed in such way that the participants had to pronounce the given content i.e. a word or a sentence several times as long as they can pronounce it accurately (see the appendixes). In fact, in this designed software, moving to other level occurred when the participants employed three strategies proposed by Tomlinson (2007) based on defined patterns to system to develop their pronunciation more accurately. These strategies indeed included affectivity, initiation response feedback and choosing how to participate based on which the students were assisted to promote and maximize their verbal performance. Furthermore, there was a rationale framework that stressed on a set of dimensions either segmental or suprasegmntal instructional targets in learners' pronunciation capabilities which, if fully assisted, help to enhance verbal performance**.** Any effective material for oral communication should empower learners to process and share

information actively, choose how to participate, control meanings, individual knowledge and raise their own awareness knowledge on pronunciation and spoken language, and go beyond the mode of initiation response feedback.

Finally, the multivariate ANCOVA (MANCOVA) was utilized to analyse the data in this study. Pallant (2013) maintains that multivariate analysis of covariance (MANCOVA) is seen as a statistical technique for the extension of analysis of covariance (ANCOVA). It is the multivariate analysis of variance (MANOVA) with a covariate(s). In MANCOVA, statistical differences are measured on multiple continuous dependent variables (posttest scores gained on elements of Word stress, Rhythm, Intonation), and Pronunciation by an independent grouping variable (online educational synchronic Application), while controlling for a third variable called the covariate (pretest scores acquired on Word stress, Rhythm, Intonation, and Pronunciation). Covariates are added in order to reduce error terms so that the analysis reduces the covariates' effect on the possible relationship between the continuous dependent variables and also independent grouping variable.

4. Results

The main objective of this study was to address the probable effect of providing online generated feedback by online educational synchronic Application on ESP learners' segmental and suprasegmental instructional targets. Indeed, this study was to answer whether there exists any significant relationship between corrective feedback by online educational synchronic Application and ESP learners' segmental and suprasegmental instructional targets. The following details the analysis of the data through the multivariate ANCOVA (MANCOVA).

The descriptive statistics for the pretest of the investigated elements i.e., three suprasegmntal instructional targets (word stress, rhythm, intonation) and a segmental instructional target (pronunciation) in the control and experimental groups were calculated before presenting the results of MANOVA (Table 1). As shown in Table 1 and Figure 1, the means for the investigated elements among the experimental and control groups seem to be close to each another on the pretest.

Table 1: Descriptive Statistics for Pretest Scores Gained on Segmental (Pronunciation) & Suprasegmental Instructional Targets (Rhythm, Word Stress and Intonation) by Group

Variable	Group	N	Mean	Std. Deviation	Std. Error Mean
Word stress	Experimental	30	19.37	4.437	.810
	Control	30	18.83	4.496	.821
Rhythm	Experimental	30	21.93	4.646	.848
	Control	30	21.37	4.745	.866
Intonation	Experimental	30	23.07	5.401	.986
	Control	30	22.53	5.309	.969
Pronunciation	Experimental	30	23.97	4.222	.771
	Control	30	23.30	4.276	.781

Additionally, Table 2 below includes the descriptive statistics for the posttest scores obtained on segmental (pronunciation) & Suprasegmental instructional targets (rhythm, word stress, intonation) in the control and experimental groups.

Table 2: Descriptive Statistics for posttest Scores Gained on Segmental (Pronunciation) & Suprasegmental Instructional Targets (Word Stress, Rhythm, Intonation)

Variable	Group	N	Mean	SD	SEM
Word stress	Experimental	30	20.70	4.324	.790
	Control	30	19.43	4.313	.787
Rhythm	Experimental	30	22.57	4.462	.815
	Control	30	21.57	4.869	.889
Intonation	Experimental	30	24.93	5.433	.992
	Control	30	23.00	5.552	1.014
Pronunciation	Experimental	30	25.27	4.386	.801
	Control	30	23.87	4.493	.820

As shown in Table 2 and Figure 1, the obtained mean score for the three elements i.e., 'Word stress', 'Intonation', and 'Pronunciation' is noticeably greater than the control group but not for the other element i.e., 'Rhythm'.

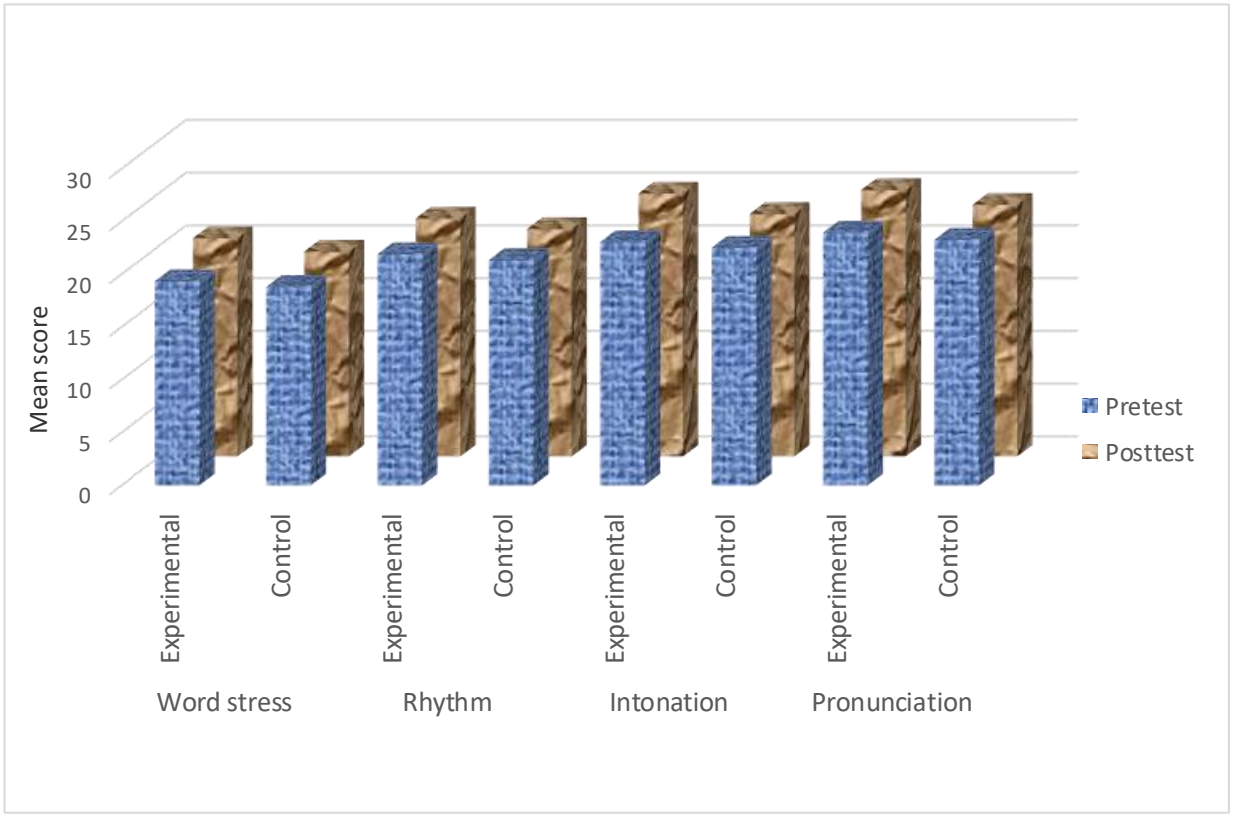

Figure 1. Bar graph of mean score of pretest and posttest for the *segmental (pronunciation) & Suprasegmental instructional targets*

Testing assumptions: According to Field (2009), three assumptions (subject independence, interval data, homogeneity of variances) should be checked before one decides to perform parametric statistical tests. In the present study, the first assumption is not violated as the current data are measured based on an interval scale. Moreover, Bachman (2005) states that the assumption of independence of subjects is met when "the performance of any given individual is independent of

the performance of other individuals" and in fact it was the case in this research. Also, the results of homogeneity of variances are summarized in Table 3. Table 3 shows that the significant value associated with Levene's test for all elements i.e., 'Word stress' (p = .67), 'Rhythm' (p = .75), 'Intonation' (p = .27), and 'Pronunciation' (p = .30) is larger than the selected significant level (p > .05) showing that the homogeneity of variance assumption was achieved for all of them.

Table 3: Levene's Test of Equality of Error Variances for Scores Gained on Segmental (Pronunciation) & Suprasegmental Instructional Targets (Word Stress, Rhythm, Intonation)

Variable	F	DF1	DF2	Sig.
Word stress	.184	1	58	.669
Rhythm	.105	1	58	.748
Intonation	1.221	1	58	.274
Pronunciation	1.079	1	58	.303

As evident from Table 4, the assumption of homogeneity of covariance was not violated (Box's M = 7.72, F = .71, p = .71, p > .05).

Table 4: Box's Test of Equality of Covariance Matrices for the Segmental (Pronunciation) & Suprasegmental Instructional Targets (Word Stress, Rhythm, Intonation)

Box's M	F	DF1	DF2	Sig.
7.718	.714	10	16082.869	.712

As observable from Table 5, multivariate tests indicated that there existed a statistically significant difference (Wilks' Lambda = .56; $F_{(4, 51)}$ = 9.86; p = .000, p < .05) in the total learners' pronunciation measures between the two groups on the posttest while controlling the possible effect of the pretest. The results showed that Partial η2 was .44 reflecting a large effect size on the basis of Cohen's guidelines (1988, pp. 284-7).

Table 5: Multivariate Tests for Scores Gained on the Segmental (Pronunciation) & Suprasegmental Instructional Targets (Word Stress, Rhythm, Intonation) in Group

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.102	1.451	4.000	51.000	.231	.102
	Wilks' Lambda	.898	1.451	4.000	51.000	.231	.898
	Hotelling's Trace	.114	1.451	4.000	51.000	.231	.114
	Roy's Largest Root	.114	1.451	4.000	51.000	.231	.114
Group	Pillai's Trace	.436	9.865	4.000	51.000	.000	.436
	Wilks' Lambda	.564	9.865	4.000	51.000	.000	.436
	Hotelling's Trace	.774	9.865	4.000	51.000	.000	.436
	Roy's Largest Root	.774	9.865	4.000	51.000	.000	.436

However, multivariate tests do not specify the precise place of difference between the two groups in terms of the investigated segmental and surasegmental elements of learners' pronunciation. That is why tests of between-subjects' effects were run (Table 6). As represented in Table 6, tests of between-subjects' effects found significant differences in posttest scores between the experimental and control groups for three elements of learners' suprasegmental instructional targets in pronunciation , i.e., 'Word stress' ($F_{(1, 54)}$ = 6.57, p = .01, p < .05), 'Intonation' ($F_{(1, 54)}$ = 21.34, p = .000, p < .05), and 'Pronunciation ' ($F_{(1, 54)}$ = 9.04, p = .004, p < .05), but not for 'Rhythm' ($F_{(1, 54)}$ = .2.33, p = .14, p > .05) between the experimental and control groups while controlling for a the covariate of pretest scores. Accordingly, it could be claimed that providing online generated

feedback by online educational synchronic Application can improve EFL learners' suprasegmental instructional targets in pronunciation.

Table 6: Tests of Between-Subjects Effects for Scores Obtained on the Segmental and Suprasegmental Investigated Elements by Groups

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Post Test-Word stress	1039.108	5	207.822	168.439	.000	.940
	Post Test-Rhythm	1208.389	5	241.678	182.925	.000	.944
	Post Test-Intonation	1733.107	5	346.621	257.016	.000	.960
	Post Test-Pronunciation	1121.492	5	224.298	236.376	.000	.956
Group	Post Test-Word stress	8.105	1	8.105	6.569	.013	.108
	Post Test-Rhythm	3.076	1	3.076	2.328	.141	.041
	Post Test-Intonation	28.775	1	28.775	21.337	.000	.283
	Post Test-Pronunciation	8.579	1	8.579	9.041	.004	.143
Error	Post Test-Word stress	66.626	54	1.234			
	Post Test-Rhythm	71.344	54	1.321			
	Post Test-Intonation	72.826	54	1.349			
	Post Test-Pronunciation	51.241	54	.949			
Total	Post Test- Word stress	25266.000	60				
	Post Test-Rhythm	30496.000	60				
	Post Test-Intonation	36270.000	60				
	Post Test-Pronunciation	37384.000	60				

5. Discussion and Conclusion

The main objective of this study was to address the possible significant relationship between providing online generated feedback by online educational synchronic Application on ESP learners' segmental and suprasegmental instructional targets. Findings showed that providing online generated feedback by online educational synchronic application can develop the ESP learners' suprasegmental instructional targets (especially 'Word stress' (p = .01), 'Intonation' (p = .000), and *segmental instructional target i.e.*, pronunciation ' (p = .004, p < .05), but not 'Rhythm' (p = .14, p > .05) in pronunciation significantly. Indeed, the results displayed the significantly positive impact of CMC-oriented instruction in comparison with F2 F instruction on the ESP learners' pronunciation development. The Syn group, on the other hand, had a tendency to vary their pronunciation achievements more than the other group. Indeed, technology is of great potentiality for suprasegmental and segmental pronunciation training, especially in terms of taking full advantage of opportunities for practice and also exposure to segmental and some suprasegmental instructional targets like stress and intonation. However, a significant difference was not found between the CMC instructional modes and rhythm suprasegmental instructional target. Some part of the results in this study i.e., providing online generated feedback by online educational synchronic Application which gives rise to developing the ESP learners' segmental instructional targets can somehow accord Zeinali Nejad et.al (2021)'s investigation on the possible effect of asynchronous and synchronous computer-mediated communication on learners' pronunciation.

The results of this study echo that speech analysis technology providing speech features realization (e.g., stress, rhythm, intonation, etc.) are of the potentiality to be considered as an appropriate methodology for the instruction of pronunciation. The present study showed the feasibility and superiority of CMC in pronunciation learning over F2F interaction in an L2 context

like Iran in the pandemic era. The present study is in line with some research studies which found significant oral outperformance of the CMC group than the control (F2F) group (e.g., Satar & Özdener, 2008; Sequeira, 2009). However, findings of this study were in contradiction with those of CMC in L2 oral proficiency development (e.g. Blake et al., 2008; Chang, 2007; Sun, 2012; Volle, 2005; Zheng, 2010).

A part of findings of this study which resonates CMC affordance on pronunciation (segmental instructional target) was in line with those of CAPT programme using automatic speech recognition (ASR). SETS (Spoken Error Tracking System), software's voice recognition feature can provide a global pronunciation score and recognizes words within a sentence which are incorrectly pronounced. Based on cognitive psychology, it can be argued that implicitly learned knowledge is kept in a dissimilar area of the brain when compared to explicitly learned knowledge (Ellis, 2009). Indeed, implicit knowledge may trigger language proficiency because it enables rapid processing. In contrast, explicitly learned knowledge is not related to online language processing, but only reflectively, when working memory and time are also existing.

Similar to our findings, some research also conceptualized that consciously learned, explicit knowledge can be changed into implicit knowledge (Ellis, 2009). When learners' attention is explicitly focused on the L2 features, this knowledge will firstly be kept as explicit knowledge. However, it may become implicit knowledge under specific conditions, for example, when explicit knowledge is applied in production with technology affordance. This reading is taken from (sub) skill-acquisition research evidence, where explicit, declarative knowledge of a skill is converted to implicit, technical knowledge through practice (Anderson & Fincham, 1994). Here, we argue that (sub)skill-acquisition theory for L2 learning can provide learners with explicit instruction and technology-affordance CF can enhance their L2 pronunciation proficiency level although our emphasis is on segmental and suprasegmental features.

Given the results of the current study, the main contribution of this research investigation is that ESP teachers can employ online synchronous application in order to enhance the pronunciation of their students focusing stress, rhythm and also their pronunciation. Furthermore, ESP learners can employ such computer programs, applications in order to make their own pronunciation better.

6. Suggestions for Further Studies

This study addressed synchronous pronunciation-focused generated feedback in the guidance and counseling ESP course, other studies can be conducted to evaluate offline existing pronunciation-focused applications and computer programs on ESP learners' pronunciation in the crisis era. For further studies, the researchers are suggested to include, comparing and contrasting more variables' effects on the area like age, kind of major in ESP course, and socio-economic factors as well. Specifically, they can focus on asynchronous and offline pronunciation-focused programs on male students or both genders with different language proficiency levels and even ESP learners in the pandemic. Indeed, because of corona virus pandemic, employing online synchronous or even asynchronous applications can contribute to education and learning different language skills and components significantly. In keeping with, some topics like the possible role of L2 learners' social and cognitive individual differences in pronunciation-focused CF effectiveness, the necessity for integrating multiple analytic methods for evaluating pronunciation-focused CF effectiveness; and the differential effects of pronunciation-focused CF for EFL speech perception in contrast with production learning are worthy of future investigations.

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8. Declaration of Conflicting Interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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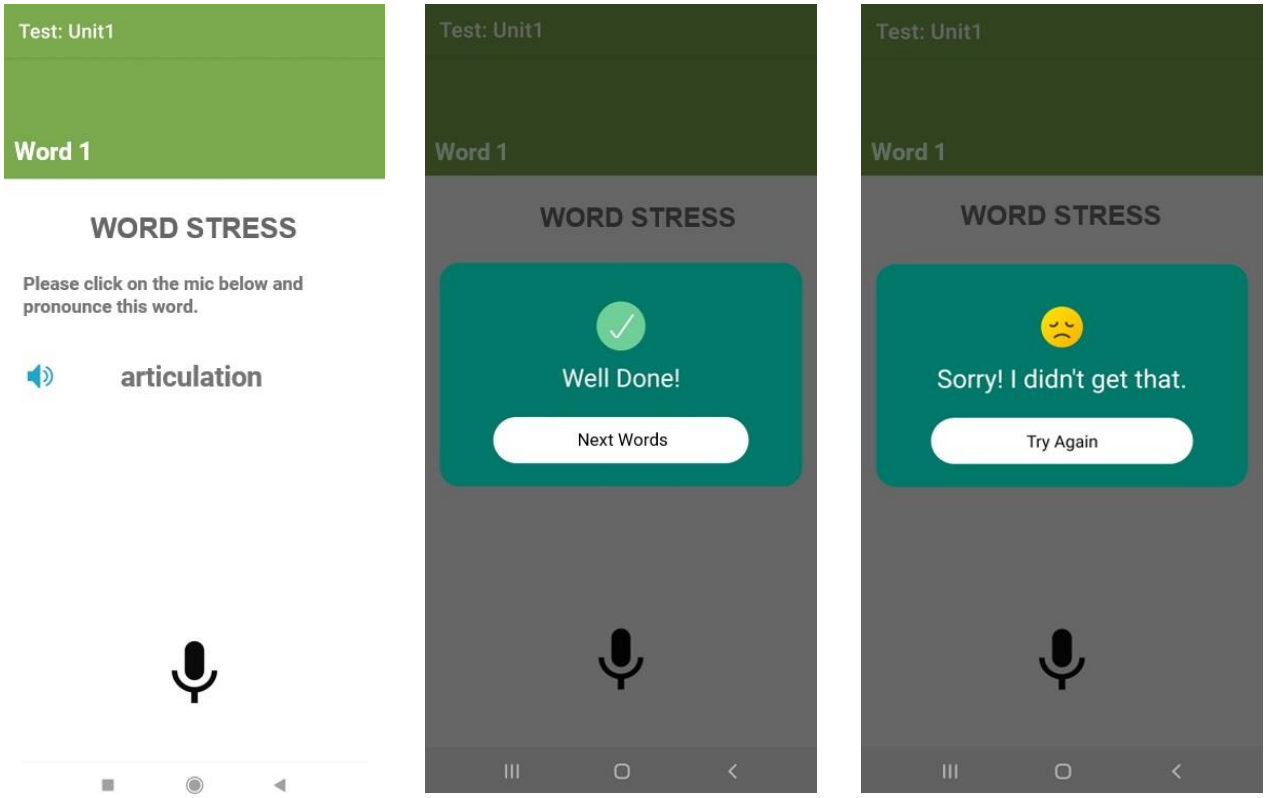
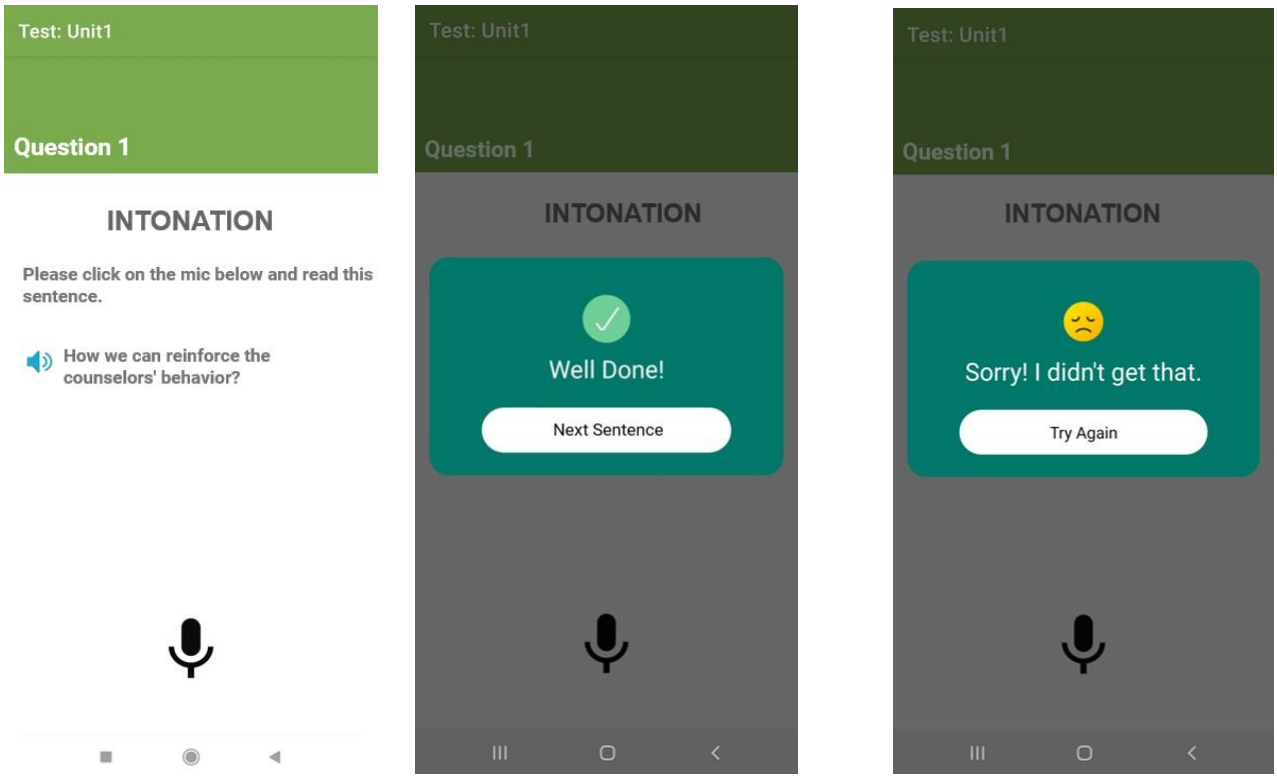
Appendixes

Appendix (A): Image of Accepted & Rejected Word Stress Corrective Feedback & Online Educational Synchronic Software in the Counseling ESP Course



Appendix (B): Image of Accepted & Rejected Intonation Corrective Feedback & Online Educational Synchronic Software in the Counseling ESP Course



Appendix(C): Image of Accepted & Rejected Rhythm Corrective Feedback & Online Educational Synchronic Software in the Counseling ESP Course