

The Effects of Multimedia-Based Instruction on the Algerian EFL Learners' Pronunciation

تأثير التدريس بالاعتماد على الوسائط المتعددة في تحسين نطق اللغة الإنجليزية للطلبة الجزائريين

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Abstract:

In our digital era of constant change and innovations, English has become the language of scientific research, publication, and technology. Henceforth, the demand on learning English has grown enormously to cope with these changes and the Algerian context is no exception. This article intends to reveal the effects of embedding multimedia tools in teaching English pronunciation to improve the Algerian EFL learners' pronunciation. Thus, it reports on an empirical study that presents an analysis of the speech productions of 20 undergraduate students of English at Biskra University. In this study, we examined the effective ways to improve the participants' pronunciation based on the multimedia-based instruction techniques and the results showed significant statistical differences between the participants' outcomes in terms of comprehensibility and intelligibility.

Keywords: Multimedia, EFL, pronunciation, stress, intonation.

ملخص:

في السنوات الأخيرة أصبح استخدام الإنجليزية ضرورة في البحث العلمي أو إنجاز مقال أكاديمي في زمن العولمة المرتبطة، لذلك تزايد الطلب على تعلم الإنجليزية في الجزائر حاليا في مجالات عدة لتتماشى مع هذه الفجوة الرقمية. ومنه يهدف هذا المقال لإظهار تأثير إدماج الوسائط المتعددة في تدريس نطق اللغة الإنجليزية لتحسين الدقة في التحدث والوضوح في مخارج الأصوات وميزاتها الفوق قطعية بالتركيز على أداء الكلمات والجمل باللغة الإنجليزية. وقد اعتمدنا منهجية دراسة تجريبية لتحليل نطق الطلبة لعينة تتمثل في عشرين طالب لغة إنجليزية بجامعة بسكرة، في الدراسة الحالية، قمنا بتفحص الطرق الفعالة لتحسين نطق الطلبة للغة الإنجليزية بالاعتماد على الوسائط المتعددة والنتائج المتحصل عليها تظهر دلالة إحصائية بين الطلبة المشاركين في الدراسة من ناحية الوضوح والدقة في النطق، وقد ذيلت الدراسة بتوصيات عدة منها البيداغوجية و تقديم نصائح للأساتذة و الطلاب لرفع مستوى اللغة الإنجليزية. الكلمات المتاحية: الوسائط المتعددة، اللغة الإنجليزية كلغة أجنبية، النطق، التشديد، تغير طبقة الصوت في الكلام.

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1. INTRODUCTION

In the age of information and communication technology (ICT), multimedia materials became more accessible than in the past in a variety of platforms, websites and digital means that non-native speakers can find and use anytime and anywhere. Nowadays, English is a prerequisite in any scientific research, international communications and publication to keep up with global changes. Therefore, in this paper, we seek to investigate the effects of embedding these materials more and more in EFL instruction environment to benefit from the authentic materials available everywhere across the English-speaking countries to take advantage of its powerful potentials to develop language teaching and learning among EFL learners to disseminate the implications of competency-based approach (CBA).

Accordingly, the communicative approach recommends focus on learners and how to develop their communicative competences not just imitations to reach native-speakerism which is an artificial goal that the vast majority of learners cannot achieve in non-natural settings of exposure to the target language (Saito, 2021). Thus, to verify the current study’s assumptions and hypotheses stating that integrating multimedia resources that use authentic language productions such as recorded or live videos and audio lessons in the classroom or online outside of the class will improve EFL learners’ pronunciation in terms of comprehensibility and intelligibility to attain an effective communication in real-life situations.

2. Literature Review

The use of multimedia-based instruction attracted attention in the past 50 years with the spread of cable television and videocassettes then the internet access has boosted the interactivity using these tools, which were used conversely to substitute the teacher in teaching language instead of facilitating his/her task. At the onset of the application of audiolingual method, the mechanical repetition was prioritized as a reflection of the behaviourism tenets but the results showed that it is not the best way to invest in such technology without involving both teachers and learners communicatively. Later, the recent developments in pedagogy showed promising results in the shift to focus more on communicative competence with a special reference on competencies and skills to maximize the advantages of the use of multimedia in education (Saito & Akiyama, 2017). In recent years, in the published research articles, there was a special interest in communicative approach in teaching English and suprasegmental features when teaching pronunciation (Levis, 2020).

In this paper, we intend to revisit the aspect of segmental orientation in teaching pronunciation and how to train learners reduce their accent in order to contribute into the research works that have been conducted in pronunciation teaching so as to find solutions to many research questions that are still unanswered in the Algerian context with a special reference to pronunciation. In order to show the recent trend of the pronunciation studies, we have reviewed the recently published papers in the last decade in the digital era of smartphones and social networking. Consequently, most of the reviewed articles tackle assessing the learners’ productions in terms of accuracy, intelligibility, comprehensibility and they focus

more on forms using different scales, graders and tools such as speech analysis softwares using automatic speech recognition (ASR) and Artificial Intelligence (AI) applications for speech synthesis or speech-to-text processing programs.

2.1 Pronunciation Instruction

In the outset, the history of teaching pronunciation flourished in the past century as stated by Celce-Murcia et al (2010) in the field of modern language teaching in two ways either intuitive-imitative approaches that are based on the teachers' impressions of the accuracy of phonetic sounds and the learners' ability to imitate native-speakers' records or analytic-linguistic-approaches that use information and techniques like phonetic alphabet and articulatory descriptions and charts to support imitation and production.

As far as pronunciation is concerned, for Munro (2018), the mid-20th-century scholars argued that second language (L2) instruction should be rooted in a comparison of the structural characteristics of the first language (L1) and L2. Thus, the previous approaches complement each other in pronunciation lessons and their main objective is to demystify the inconsistency between the spoken form and the written form of English. In the current century, most curriculum developers and syllabus designers claim that mastery of English language needs constant practice of the receptive and productive skills in communicative situations. Thus, the integration of all the language skills is necessary to attain fluency and proficiency in the English language.

In the Algerian context, where French is given more importance and its use is widespread inside and outside the academic contexts and institutions, which could influence the English language pronunciation and exposure to proper use of English. As stated by (Benrabah, 1997), the misplacement of word stress in English pronunciation is a prominent source of unintelligibility because French is a syllable-timed language whereas English is a stress-timed language. For Derwin and Munro (2015), in their well-known book *pronunciation fundamentals*, they admitted that most adult learners who are nonnative speakers of English speak it with a foreign accent who provided evidence that pronunciation intelligibility should be the utmost aim for learners rather than native-speakerism.

In the same regard, recent research works that have been conducted by Saito (2013), Derwin (2015), recommended more focus on the instruction of segmentals and suprasegmentals alike, in which they insisted on the type of instruction whether the focus should be on form or forms, in addition to the type of outcome measures that instructors use like controlled or spontaneous production. Yet, the emergence of English as an International Language (EIL) in which there is more emphasis on intelligibility and comprehensibility rather than the paradigm of native-speakerism that favours imitation of a pronunciation model based on the replication of American or British English accents. For this end, we seek to treat this research differently, in the Arab context, to be more specific in dealing with the needs of the Algerian EFL learners and how to enhance their pronunciation and reduce their foreign accent.

In the literature review, the pendulum of teaching pronunciation teaching has swung from

prioritizing it in the audiolingual method to overlooking it in the recent years of introducing the communicative method (Derwing, 2010). Recently, the teaching trends and research works emphasize all the aspects of pronunciation to improve the overall speaking fluency and accuracy of the EFL learners when communicating with natives and non-natives in real-life situations without an unintelligible foreign accent of the English language.

2.2 Multimedia-Based Instruction Studies

Although the introduction of multimedia has been going on since the age of radio and television in the past century, stakeholders in the sector of education and foreign languages teaching are still untrained to make use of the authentic materials and mobile learning applications available in recent years.

Nowadays, thanks to the digital age technologies and the availability of authentic multimedia content that is accessible on social media sites and mobile applications such *Learn English Sound Right* by the *British Council*, *Speak English Pro*, *FluentU*, and *Speakit* that are created as educational applications used in English language classes (Ipek & Ustunbas, 2021). In the same vein, teachers and learners can benefit from these materials and Computer Assisted Pronunciation Training (CAPT) in teaching and learning the target language accents better than before. Likewise, evidence from research works conducted recently showed promising outcomes of the integration of multimedia in higher education especially in the EFL context during COVID-19 Pandemic such as (Alturki & Aldraiweesh, 2022, Mahyoob, 2020; Rivera, 2021). However, more research works need to be carried out in the Algerian context to show the needs analysis of the learners and institutions as well as the best practices to be implemented for both teachers and learners.

According to (Saito & Akiyama, 2017), the implementation of video-based interaction was a facilitative tool in various aspects for the Japanese learners in the development of their vocabulary, comprehensibility and fluency in pronunciation but the length of the videos and audios is very important as stated by Derwin (2010, p. 25), “4 sessions of ten minutes are better than 1 session of 60 minutes; teach in terms of contrasts; and practice with connected speech”. Likewise, Yoshida (2016, p. 21) suggested that “the use of media to teach pronunciation including the basics of phonology, phonemes and allophones, with a special reference to consonants and vowels, and the phonemic alphabet, before ending with the rules that govern pronunciation”. She (2016) further recommended the use of mirrors, dental models, and multimedia applications through visuals using accessible audio and video files for both teachers and students. In this regard, Celce-Mercia, Brinton, and Goodwin (2010) proposed a communicative framework to implement in any class. In a related literature, the tendency in the last 20 years or so (Jenkins, 2000; Kim, 2008; Kennedy and Trofimovich, 2008) drove teachers and researchers to figure out the importance of pronunciation in teaching with a special

reference to the key features of pronunciation such as intelligibility and comprehensibility in spontaneous speech of non-native speakers.

2.3 Pronunciation Training and Speech Analysis

Pronunciation in recent years witnessed more research and attention after a long period of neglect due to the abandonment of the audiolingual method which prioritized once the mechanical repetition of native speakers' production to reach nativelike pronunciation. However, the latter did not bring about the sought results and with the rise of communicative approach pronunciation training gained more attention to reach fluency but with more emphasis on comprehensibility and intelligibility rather than just imitation of the native speakers. Correspondingly, pronunciation is considered a critical aspect in the EFL learning, including segmental features (individual sounds or phonemes, vowels, consonants and allophones) and suprasegmental features (stress, intonation and rhythm). The latter features create a challenge for the EFL learners to master in which they often struggle to achieve accurate pronunciation due to their mother tongue interference and the lack of exposure or specialized training using the correct materials and corrective feedback.

Pronunciation training is so important in the EFL context to master pronunciation using different techniques like (MBI), (ASR) and CAPT tools to enhance learners' productions. In the first step of training EFL learners, the choice of the authentic materials and the teaching method and techniques is crucial through integrating the effective ways to improve pronunciation instruction such as using MBI to make use of visual, auditory and interactive elements through visual aids such audios, animations and IPA charts to help the EFL learners tell the difference between the phonemes on the segmental level together with audiovisual aids modeling to let the EFL learners observe mouth movements and lip shapes in order to mimic native-like productions. In the second phase, after memorizing the speech sounds of the English language accurately, the EFL learners are required to receive a prosodic training of the suprasegmental features of the English language through multimedia with special reference to stress patterns in words and sentences and intonation in order to improve their rhythm and fluency in speaking.

The speech analysis of the EFL learners requires expertise and scientific methods of analysis using accurate softwares designed specifically for that objective like Praat speech analysis programme, which measures formant frequencies (F1, F2) to assess vowel accuracy when compared to native-speakers' productions. Another method of analysis is the use of (ASR) for immediate pronunciation feedback, it provides corrective feedback on the errors and it detects mispronunciations to improve phoneme discrimination through repetition exercises. There are many softwares that the EFL teachers and learners use like (Rosetta Stone, Google Speech or TalkPal AI).

In the speech analysis process, we can use CAPT tools with Praat (ELSA Speak, Pronunciation Power) for acoustic analysis to enhance pronunciation to visualize spectrogram analysis and pitch tracking in addition to duration measurement of the stressed syllables.

In the previous studies that has been reviewed prior to conducting the current study, we found that most research findings on the use of multimedia to improve pronunciation showed that MBI instruction significantly improve both segmental and suprasegmental accuracy of the learners (Hirschi and Kang, 2024). Another study examined the use of ASR-based training for better speech perception and production of the English suprasegmental features in the Algerian context and it was concluded that the ASR was an effective tool for the EFL students (Souici, 2023). Additionally, (Amrate and Tsai, 2024) in a systemic review of the use of CAPT systems, in some articles published between 1999 and 2022, found that most of the studies focused on the pronunciation training of adult English learners with an emphasis on the production of segmental features (i.e. vowels and consonants) rather than suprasegmental features (i.e. stress, intonation, and rhythm).

3. Methodology

3.1 Research Design

In this research, we used a quasi-experimental study to analyse the effects of multimedia-based instruction as the independent variable with reference to pronunciation improvement as the dependent variable. The main reason behind conducting this study is to find an answer to the problematic of whether multimedia resources that are employed in the classroom enhance the potentialities of EFL learners to better pronounce English language or not. Hence, the EFL students who participated in our research study were divided into two groups. The first group has learnt English pronunciation using multimedia-based instruction as a teaching method for eight weeks in a duration of twelve hours of intensive instruction, whereas the other group has learnt English pronunciation using the same content without embedding multimedia resources in the classroom during the same period of instruction (traditional teaching).

The subjects have had some pre-tests and recordings while pronouncing English on *segmental level proficiency test (phoneme-level)* and *sentence-level proficiency test (prosodic-level)* before the experimentation and after the treatment as a post-test during the different stages of the experiment. Both tests utilised the same set of words and sentences in which they started with word-level then sentence level afterwards then the scores were compiled to be compared with the native-speakers’ audio recordings using the acoustic analysis software Praat.

3.2 Research Questions

Despite the emphasis of recent studies on the use of CAPT tools in pronunciation training, we focused on the acoustic level via Praat software to obtain comprehensive insights into the effects of MBI on both segmental and suprasegment features, that is why an in-depth quasi-experimental research design was designed. Thus, the study comprises a speech analysis using Praat software which involves a systematic approach to analysing and improving speech sounds of the participants’ productions of the experimental group after treatment and a control group to measure if there are significant statistical differences between both groups or not. In other words, this study reports on empirical research examining to answer the following questions:

1. To what extent the multimedia-based instruction and the exposure to authentic materials improve the Algerian EFL learners' pronunciation development?
2. What are the difficulties that the Algerian EFL learners face in their pronunciation of the segmental and suprasegmental features of English?

3.3 The Participants

The participants of the study were chosen randomly from a whole population of undergraduate students of English at the University of Biskra in Algeria. Then, the actual sample of the experiment were randomly assigned into control (n=10) participants aged between 18 and 20 years-old and an experimental group (n=10) in the different stages of the pre-test, treatment and post-test to compare their results using Praat software to measure the acoustic qualities in terms of segmental (vowels accuracy) and suprasegmental (stress placement and intonation) features.

3.4 Procedures

In the process of pronunciation training, the whole study was divided into three phases to come up with consistent and reliable data. In the first stage, the participants were asked to read aloud a list of words as a standard passage containing the segmental and suprasegment features of the English pronunciation. This phase represents the pre-test which serves as the control parameter between the prior knowledge of the aspects to be studied and the difference in the outcomes of the participants after the treatment.

The recordings of the participants will be analysed using Praat software. Then, in the second phase, the treatment process was conducted in the language laboratory in a duration of 8-week instruction using both the multimedia-based instruction method and the traditional way of teaching in the classroom for the control group. It should be mentioned that the treatment was done on weekly basis for two months in a ratio of one session per week, and each one lasts 90 minutes with varying activities and assessment tasks. In the final phase, the same passage that was used, in the outset of the study, has been recorded again for post-instruction as a post-test comparison.

3.5 Instruments

In the process of systematic data analysis of the students' pronunciation, the subjects were sorted out into two groups for comparative purposes according to proficiency-based categorization to analyse the acoustics of learners' pronunciation. The subjects of the study were categorised into control group (CG) composed of ten participants without intervention and the experiment group (EG) to measure the improvement resulted from the instruction in terms of individual sounds adapted from short videos pronounced by native tutors from the British Council for elementary level where the students were exposed to phonetics lessons for duration of one month and 90-minute sessions using MBI method.

Table 1. The Experiment Design

<i>The Experiment</i>	<i>Proficiency aspects</i>	<i>Segmental features</i>	<i>Suprasegmental features</i>
Phase one	Recordings	Detect mispronunciation	Find prosodic errors
Phase two	Treatment	Instruct individual speech sounds	Teach prosodic features
Phase three	Post-instruction	Compare results	Find statistical differences

3.5 Data Analysis

To examine the data of the participants, the coding process was done to assess the pronunciation features for both groups before and after the treatment. So, the pronunciation measures that were tested in the study are the accuracy of the pronunciation of the vowel phonemes and their minimal pairs (segmental accuracy) that is pronouncing the vowels correctly compared to native-speakers in addition to placing stress adequately on the words and sentences (prosodic accuracy). The corresponding process was summarised as follows:

Table 2. The Evaluation of the Participants' Results

<i>Participants</i>	<i>Target aspects</i>	<i>Instructional type</i>	<i>Test type</i>
10 students	Segmentals and Suprasegmentals	CG (Traditional method)	Mispronunciation errors
10 students	Segmentals and Suprasegmentals	EG (Multimedia-based Instruction)	Mispronunciation errors

The data obtained from the subjects we have instructed are summarised in the table 3 below according to the descriptive statistics obtained from Praat software to compare native-speakers' productions and the participants' outcomes with a special reference to the effects of MBI on the improvement of the segmental and prosodic features to increase comprehensibility and intelligibility plus reducing accentedness.

Table 3. Summary of the Participants' Errors

<i>Participants</i>	<i>Segmental features errors</i>						<i>Suprasegmentals errors</i>		
CG students	/i:/	/ɪ/	/e/	/æ/	/ʊ/	/u:/	Minimal pairs	Stress	Intonation
Student 1	5	4	3	4	5	4	3	2	3
Student 2	6	5	4	3	4	5	4	3	2
Student 3	4	4	3	2	3	4	3	3	2
Student 4	7	6	4	3	4	3	3	4	3
Student 5	5	4	3	4	4	4	2	3	3
Student 6	6	3	4	3	3	4	3	3	2
Student 7	4	5	5	3	4	5	3	4	3
Student 8	7	4	5	4	3	4	4	3	2
Student 9	5	6	5	3	4	4	3	4	3
Student 10	5	4	3	4	3	5	2	3	2
EG students									
Student A	3	2	1	2	3	2	1	1	1
Student B	2	3	2	1	2	3	2	2	1
Student C	3	2	3	2	2	3	2	2	2
Student D	4	3	2	2	2	2	1	2	1
Student E	3	2	3	2	3	4	2	1	2
Student F	4	2	2	2	1	3	2	1	1
Student G	2	1	2	1	2	2	1	2	1
Student H	3	2	2	1	2	2	2	1	2
Student I	3	2	3	2	2	3	2	2	1
Student J	3	2	1	3	2	2	1	2	2
Student K	3	1	2	3	3	2	2	1	2

It should be noted that the CG students received the same content but in a traditional method of instruction whereas the EG students took specialised phonetic training with audiovisual aids and multimedia tools then analysed using Praat visual feedback.

4. Results

Through careful analysis of the data driven from the students' productions, we have found that the score of the EG was lower in the number of mistakes that is their achievements were better when compared to the CG who did not receive any treatment to learn from native-speakers pronunciation. The table 4 below summarises that statistical data in details per each item as follows:

Table 4. Summary of the Participants' Results

Features	Groups	Means	SD	Variance
/i:/	CG	0.84	0.84	0.71
	EG	0.67	0.67	0.45
/ɪ/	CG	0.84	0.84	0.71
	EG	0.74	0.74	0.55
/e/	CG	0.74	0.74	0.55
	EG	0.60	0.60	0.36
/æ/	CG	0.85	0.85	0.72
	EG	0.67	0.67	0.45
/ʊ/	CG	0.67	0.67	0.45
	EG	0.67	0.67	0.45
/u:/	CG	0.63	0.63	0.40
	EG	0.70	0.70	0.49
Minimal Pairs	CG	0.74	0.74	0.55
	EG	0.67	0.67	0.45
Stress	CG	0.67	0.67	0.45
	EG	0.67	0.67	0.45
Intonation	CG	0.53	0.53	0.28
	EG	0.80	0.48	0.23

The tabulated data above show statistical differences between the CG and the EG in the overall means of error scores which are mostly lower than the CG or equal in the EG students across all the investigated vowels and suprasegmentals. In addition, the same results were obtained in the standard deviations which are slightly lower in the EG group, meaning the performance of the trained students using MBI was more consistent. For the last statistical parameter, the calculated variance or the squared SD confirms that the EG students had smaller dispersion in their scores which means they outperform the majority of the students in the control group in most of the items.

The reported results above reveal that the largest difference in means is in the vowel /i:/ and /u:/ which create a challenge for most students due to their difficult articulation and suprasegmental features which difficult for most students though the trained participants with MBI method showed a remarkable improvement and statistical differences in the scores of both groups in favour of the experimental group.

5. Discussion

As indicated in the results obtained earlier, the experimental group demonstrated significant statistical differences in segmental and suprasegmental features in pronunciation between both groups of the participants, which answers the research questions we have put forward at the beginning of the current study. Thus, as aforementioned, we can confirm that the use of multimedia-based instruction in pronunciation training and the exposure to authentic materials will surely improve the Algerian EFL learners' pronunciation development in terms of segmental and suprasegmental features. On the other hand, the findings of the current study revealed that the participants encounter many difficulties when comparing their results with the trained students which means that the Algerian EFL learners face various pronunciation errors in the individual sounds, that is, the articulation of phonemes and the suprasegmental features of English language such as stress in words or sentences, minimal pairs and intonation of the questions and statements.

The mispronunciation of the English words and sentences stems from different factors. Mainly, the influence of the mother tongue and in the Algerian context even the influence of the French language may play a role in the pronunciation of the words originated from French or the vowel sounds that look like French in the articulation of the students who are not well exposed to the authentic materials and native speakers pronunciation. This claim is supported by many researchers in the field like (Munro & Derwing, 1995; Benrabah, 1997; Saito, 2021).

The main contribution of the current investigation is to shed the light on the importance of pronunciation training in the Algerian context for the students of English in order to improve their comprehensibility as a key factor in their fluency which is very important for listeners to understand them easily in addition to enhancing intelligibility of the speakers through raising students' phonological awareness towards phonemic transcription, exposure to authentic materials and communicating with native-speakers in order to reduce their foreign accent.

In specific sense, after conducting the research study, it is recommended for EFL teachers to use multimedia and technology-enhanced applications and website for improving learners' pronunciation. Therefore, teachers in their preparation of the lessons are advised to integrate more audiovisual aids and AI-enhanced application for creating more interactive learning environment. It is also noticed that the majority of learners begin learning English reading words instead of starting with recognising the phonemes and listening to authentic English, which created fossilised mispronunciation among them.

It would be ultimately interesting for both future researchers and teacher or even learners to use the newly developed AI tools to create and generate adapted multimedia clips to improve learners' pronunciation in terms of segmental and suprasegmental features equally in order to achieve comprehensible nativelike performance though it is not the ultimate goal of the foreign language learners.

We can conclude the current study with a suggestion for the pronunciation practitioners towards the emphasis on fluency over the attainment of nativelike pronunciation which is so hard for most

foreign language learners. As supported by Saito (2012) in his article, he wrote that some teachers and researchers are doubtful about the promising potentials of pronunciation teaching due to limited materials and the lack of teachers' training. However, the pronunciation instruction is important for improving segmental and suprasegmental aspects of learners' English sounds.

6. CONCLUSION

It is clearly proven from what has been analysed and discussed previously that the place of multimedia in teaching and learning English pronunciation is underestimated in the Algerian context for that there is a lack of practice and exposure to authentic materials and communicative tasks in the educational settings. In this regard, there is a lack of an appropriate training for the students to improve their pronunciation due to the poor infrastructure in speech training and analysis of students' productions.

Although the sample of the students, we have driven data from was not large to overgeneralise the results to the whole population of the students in the Algerian context, there is a general consensus between the students and the teachers that there are many challenges and needs to achieve the sought recommendations. To conclude, the approach of integrating multimedia-based instruction in improving the Algerian students' pronunciation was successfully implemented but it needs to be technology-enhanced using the newly introduced AI tools that simulate the authentic speech of the native speakers with immediate corrective feedback the pronunciation errors.

Conclusively, there is an urgent call for further and up-to-date empirical longitudinal research studies on the use of technology in improving learners' pronunciation. So, it is highly recommended for future researchers in the scope of teaching English to non-native speakers to investigate the implementation of new technologies in enhancing the pronunciation of the EFL learners in the Algerian context.

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