

Elsa Speak App: Automatic Speech Recognition (ASR) for Supplementing English Pronunciation Skills

Adhan Kholis

Universitas Nahdlatul Ulama Yogyakarta, Indonesia

Email: adhan@unu-jogja.ac.id

ABSTRACT

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Nowadays, artificial intelligence (AI) became a special concern in language teaching for the reason that it can assist and enhance language learning for all levels of education. Again, it had beneficial roles for supplementing language teaching like ELSA Speak App one of Automatic Speech Recognition (ASR) used for teaching pronunciation. It studied how students heard, voiced, uttered, vocalized, and asserted the English words in the oral language, but the students often pronounced incorrect words with the result that the uttered words had faulty meaning. This study aimed to carry out English Language Speech Assistant (ELSA) Speak App to improve English language pronunciation skills to higher education learners that were the English Department Students of *Nahdlatul Ulama* University of Yogyakarta (UNU). The data were collected using a test of pronunciation and interview. The researcher also taught in the classroom. The results showed that ELSA Speak can increase the students' pronunciation skills. It can be seen from the average scores obtained from the teaching cycles from two to four in grade. Clearly, ELSA Speak helped the students pronounce diverse words more easily and comprehensively. Also, the available features offered by this app like instant feedback enabled the students to pronounce precisely. In conclusion, ELSA Speak can improve the students' pronunciation skills well and effectively. Indeed, it can motivate the students to engage in learning to pronounce.

Keywords: artificial intelligence; ELSA Speak; pronunciation skills; technology

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INTRODUCTION

English is a means for communication worldwide. It has been a global language (Crystal, 2003). It is regarded as an international language because most people in the world use it in daily life for many kinds of purposes: working, educating, getting jobs, transaction, and business. Definitely, to make sure that the message is delivered to the listeners, people must possess competencies in English like speaking one skill regarding the producing words. Speaking is one of the most vital skills in English. In the field of works, the competence of speaking is very needed. People used to English for getting a job like applying TOEFL, TOEIC, and IELTS for continuing the study and working in many places. Many industries demand the employee to be active in communication and interaction. People should be able to convince others with good English orally.

In speaking, the most concern people must know is also how to pronounce words well. Pronunciation is one of the English skills regarding the mastery of phonetics and phonology how words are articulated and produced into sound systems. It is necessary for making the message clear and to be understood by the listener. There must be two accents namely British and American style. People can use both or one in practice. Both exactly have differences in each word even in sounding and articulation. Those make people difficult to pronounce English words. For most communication in daily life like

greeting and others, the American model is usually a useful style because people instantly want to create clear interaction not thinking of the presence of grammatical uses. Occasionally, the structures of sentences are often neglected by the speaker because it obstructs the fluence of the utterance itself.

To formally exist, pronunciation should be taught in language teaching in the classroom. It becomes the subject of the English course. It includes some aspects such as sounds, stress, rhythm, and intonation (Gerald, 2001). Teaching pronunciation has passed a shift from a narrow approach focusing on segmental features like phonetics and phonology to a comprehensive one stressed on suprasegmental features like stress, intonation, rhythm, and sounds (Tergujeff, 2012). For decades, teaching pronunciation is sometimes disregarded (Hincks, 2003). The attention to students' pronunciation errors which can inhibit efficacious communication is a fundamental concern on why it is urgent with pronunciation in the classroom. Practically, there are some roles of teachers when teaching it: helping students hear and make sounds, providing feedback and correction, establishing priorities, devising activities, and assessing progress (Joanne, 1988). Students hear the sounds as the teacher said natively. After hearing the sounds, students immediately filter them into the mind. Indeed, teachers force students to be more active in producing words as students hear. The feedback and correction should be given to

know the progress. Since the pronunciation is so complicated so that teachers should regard the exercise types and activities in the form of practice. Theories and practice in spelling words must be balanced. Teachers should use some approaches and methods in teaching it to make students easy to produce and pronounce words well. Every student wants to be able to speak as a native speaker.

There must be problems arising teaching pronunciation in the classroom from either teachers or students. It is distinct with the writing focusing on marks on paper which are no sounds. It concentrates with the receiving voices in the ear and contacts directly in face-to-face activities (J.D. O'Connor, 1998). Firstly, it tends to teachers lacking interest in the subject. Secondly, teachers' knowledge of pronunciation contrasts with the practice (Gerald, 2001). Many theories of pronunciation have been possessed by teachers, however; there is no time for practicing and producing words in daily activities enabling teachers are not successfully difficult to pronounce words. The average of teachers' English habits can be seen when the teacher teaches in the classroom. Because English is not the primary language in Indonesia, English teachers have limited time to consume it in a routine. This may be the lack of teachers' mastery in lots of vocabulary. Teachers need to habituate speaking in the classroom fully so that students are enthusiastic about joining the class.

Sometimes, teachers still make mistakes in giving an example of sounding words. Indeed, students' dependency on teachers as a model in learning to pronounce which corrects and evaluate the sounds still dominates (McCrocklin, 2015), whereas teachers' instruction in pronunciation class is a lack (Baker & Burri, 2016). This makes students have a little space for expressing the words freely. Mostly, students may receive habits of pronunciation from different places and people (Tlazalo Tejada & Basurto Santos, 2014) making students get lost of interference of knowledge.

The native language also gets a great factor in learning to pronounce English (Joanne, 1988). There must be two accents in English that are British and American. Both have the own style and characteristics in spelling words making it students difficult in predicting each word. Others, the basic problem in English pronunciation is to construct the set of boxes conforming to the English sounds (J.D. O'Connor, 1998). There must be lots of sets of phonetic and phonological rules connecting each other to create one formula. The English letters are different from Indonesia. Some have adequate similarities like 'th, 'ch, and 'sh. One letter has more sounding. Different from the Indonesian language, English is unique in all words. The sounds are disparate from their original form. For instance, the word "one", students must say "wan" not "one". In case students are not familiar with the English words so that the errors and mistakes often appear. The other features

of pronunciation are minimal pairs of two words which differ by only one sound like 'lice' and 'rice'. The best way to learn pronunciation is to create habits in speaking and bringing technology to support it.

Recently, technology stands in people living for many certain purposes including virtual interaction, transferring goods and services, a transaction in business, commercial jobs, and even for education. It's time for the educational sector to fully adapt in modifying teaching and learning. Many schools and institutions have technology facilities such as Learning Management System (LMS) to support the learning processes. Some popular online classrooms for teaching in Distance Education (DE) are Google Classroom, Edmodo, Microsoft Team, and Moodle. Those all belong to the Massive Open Online Course (MOOCs) used for online learning. It can give the students' appraisal of the online meeting in the form of grade levels. The emergence of technology in education also brings influences and modification toward teachers' methods in teaching. For a long time, the roles of teachers in the classroom are vital as the model or actors for students' advances. Mostly, the method refers to the lecturing giving lots of explanations in front of the class. There is no innovation in learning. Students get passive learning. Conversely, with technology, teachers are as a facilitator and instructor in practice. Many teachers' works are finished quickly. Technology can simplify teachers' jobs in

explaining courses. But, for the clueless teachers about technology, it adds new problems only for learning to operate tech. It is necessary for training teachers in using tech.

Technology is coming for supporting language teaching and learning. For many years, it was still in the form of chalk and blackboard. The phonograph, movies, and tape recorder are also as means for language teaching (Ahmad, 2012). Then, the emergence of Computer Assisted Language Learning (CALL) has been formulated in fostering language learning (Fatemeh, 2014) focusing on using a computer to work in word processing, excel, and PowerPoint. Then, in the industrial revolution 4.0, the term of the internet of things (IoT) and artificial intelligence (AI) has grown very fast for many works like browsing, business, networking, commercial, even learning. The AI refers to as a machine, computer or computer system reproducing the functions of cognitive aspects of the human mind like learning and problem-solving Russel in (Pokrivcakova, 2019). It can be a very helpful device for second language error correction (Dodigovic, 2007). It has the potency for assigning more motivation and chances to students to engage in spoken communication in the target language (Underwood, 2017). The use of the internet and technology in English face-to-face and virtual meeting serves the greater opportunities for valuable and authentic language uses than ready in the class (Richards, 2015). The

networking in language learning also indorses learners to link in universal. Learners can access many resources such as e-books, pdf, article journals. It can make self-regulated learning or autonomous learning. Students can easily open in World Wide Web (www). Nowadays, the term of Mobile Assisted Language Learning (MALL) shaped the habits of students' learning and social interaction (Kannan & Munday, 2018). Most students can use mobile devices in attending classroom activities. They can practice at their own motion, at any time and anywhere they are. Consequently, to bring and engage students in pronunciation classes, the use of mobile devices is compatible (Fouz-González, 2020). Many iPhone and smartphone applications have the superior potential to rehearse and increase the aspects of English pronunciation (Fouz González, 2012).

At present, many software and digital platforms or applications become the tool for language learning (Joy Calvo Benzies, 2017) like ELSA Speak software for learning to pronounce. Located in San Francisco established in 2015 by Vu Van, it is one of the smart artificial intelligence technology for language learning especially for learning to speak and pronounce. This app is also categorized as the Mobile-Assisted Language Learning (MALL). It sustains the learning process to become a two-way direction. For instance, when students pronounce words or certain sentences, the system of ELSA Speak does

analysis and gives correction feedback. For users, there must be register sections before using the app. In the initial face of ELSA Speak App, there were some choices toward the levels of users' ability toward English. The stages of skills were also available. It is Automatic Speech Recognition (ASR) can help students increase the pronunciation and speaking skills outside of the classroom (Xodabande, 2017). This app is available on all mobile devices like smartphones or android identifying the words that people speak into the microphone, and solely change them into legible text (Liakin et al., 2015). ASR can improve quickly in accordance with the accuracy in identifying the spoken discourse and transcribing it into written text (Carrier, 2017). It also can simplify the new mode to undertake on phonology and accent. Indeed, it can give direct formative assessment and feedback on the accuracy. Furthermore, ASR can aid students' works on pronunciation including the segmental features (Neri et al., 2008). In the ELSA Speak App, students can learn the scope of pronunciation like phonetics and phonology how words are written and articulated in the right way.

This study focuses on the implementation of ELSA Speak application to support the students' pronunciation skills. It is conducted to know the effect of using ELSA Speak app in supplementing the students' pronunciation skills. The researcher used this app in learning to pronounce for the reason that it was the

one automatic speech recognition used by most and the contribution in enhancing pronunciation skill.

METHOD

This study dealt with classroom action research (CAR) as the research design. Collaboration both qualitative and quantitative methods were also the concern of this study. In this study, there were some cycles in the learning including planning a change, acting and observing, and reflecting the processes. All cycles were repeated until the researcher got the desired results. Firstly, the researcher plan to use ELSA Speak application in teaching pronunciation including designing and organizing the lesson plan and teaching method. Then, the researcher began applying Elsa Speak App in the teaching and learning processes. To know the students' responses and development during using it, the observation is conducted gradually. Finally, the reflection toward the learning was done to know the overall learning whether it was clear or lack. In this case, the subject was the English Education students of Nahdlatul Ulama University of Yogyakarta semester two graded 2018 consisting of 18 students. This study was conducted during teaching pronunciation courses and phonetics and phonology. For collecting the data, the researcher used some instruments like a checklist of observations and a questionnaire. The test and non-test techniques were also employed. In knowing the students' pronunciation

skills, the technique of testing was applied by giving a spelling word test. While for non-test one, the researcher interviewed some students about 10 English education students of Nahdlatul Ulama University of Yogyakarta in accordance with the student's perception and responses toward using ELSA Speech App. Also, the researcher gave the questionnaire in the form of essay questions related to the use of ELSA Speak app in teaching pronunciation. The pre-test and post-test are also given to know the students' pronunciation skills. The same test was used to compare both the pre-test and post-test scores. To analyze the data, the researcher used triangulation analysis for comparing the data.

RESULT AND DISCUSSION

This section dealt with the research findings and the discussion. It focused on the implementation of ELSA Speak Application in supporting the students' pronunciation skills. The findings were withdrawn from the cycles of learning activities in the classroom and the last score toward post-test. It was also supported by the results of the interview and questionnaire. It is presented on the table of pronunciation scores shown in the table of T-Test. For knowing and investigating the students' perception toward using ELSA Speak App, the students' answers in an interview were used. This study was conducted in semester three about in the 15 meeting. It was divided into three phases or cycles

which each consisted of about five meetings. Each phase has the same activities including planning a change, acting and observing, and reflecting the processes of learning.

Firstly, in Cycle one, it ran about five meetings in teaching and learning. The researcher planned, designed, and organized the lesson plan and used ELSA Speak App for learning to pronounce. The teaching method used was Communicative Language Teaching (CLT). In the preliminary phase, the activities began with a greeting, checking the students' presence, and explaining the teaching materials and learning objectives. Indeed, brainstorming always be given before main activities to engage students in learning processes. After that, the topics were explained by giving examples. Since this was the pronunciation class, the learning was focused on how the students sounded the words in the right utterances. The drilling and training were as the main activities. The researcher gave the texts to be read periodically before the students pronounced it. Then, the researcher showed the ELSA Speak Application downloaded from Smartphone and telling the benefits and the functions even the features which were available on the app toward learning to pronounce. The students started to download the app on android. For the main activity, the researcher asked the students to read the whole text given loudly one by one to know the students' pronunciation skills first before using the ELSA Speak app. In

the middle of learning, it was time to utilize the app. The researcher gave training and instructions toward operating ELSA Speak. The students can also select the level and stages of skills and adjust based on their ability in pronunciation. Here, the researcher observed all students' activities when the students used ELSA Speak in the classroom. The students were enthusiastic and motivated in learning. They got opportunities to know the errors and mistakes in sounding words on responses of systems of the app. The correction and feedback were immediately given.

For the reflection of the learning processes, the researcher gave the assessment of pronunciation including spelling words and reading texts. The aspects in accordance with the pronunciation rating included accuracy in grammar, accuracy in vocabulary, fluency, appropriacy, and comprehensibility. Each has different scores in estimation. Also, to know more about the achievement, the spoken test-like questions and answers were applied. The test of performance was established at the end of the cycles. The results said that the students' scores of the pronunciation were significant and improved. In the initial study before conducting the post-test, the average scores of the students' pronunciation test were 60 from 16 students, whereas the scores of the maximum were 70. In Cycle 1 after using ELSA Speak app, the students' scores were increased by about 72.7 from 16 students while the maximum score was

75. It was shown in the following table below:

Table 1. The students' Pronunciation Performance in Cycle one

	Accuracy in Grammar	Accuracy in Vocabulary	Fluency	Appropriacy	Comprehensibility
Preliminary	2	2	1	1	2
C1	3	3	2	2	3

* The average scores of each pronunciation indicator

From the table above. It highlighted that the students' performance in cycle one was increased than in the preliminary study.

Secondly, in Cycle two, the teaching and learning were similar to cycle one where the researcher used Communicative Language Teaching (CLT) in teaching pronunciation. Here, the main differences were the learning activities during using ELSA Speak App. The students were asked to try to choose the next stages or level where it had more difficulties in

vocabulary and practice like sounding the diphthong words, stressing words, and connecting each word to others. This was done repeatedly to get better pronunciation. For the results, students get better scores than cycle one. The average scores of the students' pronunciation test were 75 from 16 students while the highest scores were 80. The students' pronunciation scores in cycle two were represented in the table as follows:

Table 2. The students' Pronunciation Performance in Cycle two

	Accuracy in Grammar	Accuracy in Vocabulary	Fluency	Appropriacy	Comprehensibility
Preliminary	2	2	1	1	2
C1	3	3	2	2	3
C2	3	3	3	3	3

* The average scores of each pronunciation indicator

Clearly, the table above has shown that the students' pronunciation achievement got significant. It has emerged from the scores in cycle two.

In the last Cycle, the learning activities were still the same as the previous one. Learning started with greeting, brainstorming, and leading the

learning objectives. Some drilling and practices were more given to know the students' progress in learning. Moreover, many tasks and materials were provided to stimulate the students' engagement in learning to pronounce. Inevitably, the level of skills was improved. The students got more complex exercises in sounding words in the sentence forms. The researcher also gave some feedback and evaluation toward learning by asking the

difficulties and progress. Questions and answers were also done to know to what extent the students can pronounce words well and clearly in practice. In Cycle three, the students' scores were excellent where the scores were 80 from 16 students. The highest scores were 85. The table below represented the progress of students' pronunciation

Table 3 The students' Pronunciation Performance in Cycle three

	Accuracy in Grammar	Accuracy in Vocabulary	Fluency	Appropriacy	Comprehensibility
Preliminary	2	2	1	1	2
C1	3	3	2	2	3
C2	3	3	3	3	3
C3 three	4	4	4	4	4

* The average scores of each pronunciation indicator

As has been shown above, the students' achievement in sounding words was greatly increased. It meant that ELSA Speak app can support the students in improving the pronunciation. The eases were obtained by the students. Clearly, there must be differences between the conventional instructions like teachers do all this time and the modern way like the use of Automatic Speech Recognition (ASR) in learning to pronounce. These results conformed with the (Elimat & AbuSeileek, 2014) study conducting the experimental research which showed that there was a significant difference between the experimental class taught by using

ASR and the control class taught by the regular teaching. The use of ASR was more effective than the traditional mode in learning to pronounce. Moreover, the (Fathi Sidig Sidgi & Jelani Shaari, 2017) research on the use of ASR in pronunciation class got significant results. It claimed that ASR was very beneficial in supporting the students' pronunciation skills and helping the students appreciate the error and mistakes in sounding words. Indeed, (Guskaroska, 2019) in the theses research said that ASR can improve pronunciation skills. It was proven by the better scores of the experimental group than the control group.

The findings were also obtained from the interview in accordance with the students' perception toward using ELSA Speak App in the pronunciation class. The students' answers were shown in the following transcript below:

Researcher: [What do you get of using ELSA Speak App in learning to pronounce?]

The student 1: [I am motivated in using this app for my learning to pronounce. ELSA Speak app gave me simplicities and more facilities in learning. My utterances can be corrected and revised directly as the native said. I got lots of vocabulary and practices].

The student 2: [I am very enjoyed using ELSA Speak app in learning. it can help me revise my speaking. I can learn more English words even long sentences. Also, I can study the phonetic and phonology aspect. I can study words whenever and wherever I am].

The Student 3: [This is a good application for learning to speak and to pronounce. I no longer went to abroad to meet tourist only for talking and discussion using English, but with this App I feel I talk with English people. My speaking was corrected by native. I was motivated in using it].

The student 4: [ELSA Speak app has supported me in improving my pronunciation skill. I can sound many words correctly. This app gave me chances to learn more about words, phrases, even sentences well. I was a very spirit in joining the class].

From the interview above, it was clear that ELSA Speak application enabled the students to learn pronunciation more easily and fast. It gave usefulness especially in giving correction and feedback instantly. The students were motivated in learning to pronounce words. This corresponded with the (Sarmita Samad & Aminullah, 2019) study stated that the ELSA Speak app was suitable for learning to pronounce. Many content categories available were good such as programs related to the English proficiency level. Indeed, the features like vowel and consonant sounds, the diphthongs, syllabic, and word stress can be the reference for learning. From the students' participation toward the use of ELSA Speak App in pronunciation, the students' excitement was high. The attitude in learning can be shaped and controlled. They can learn by themselves. This statement was supported by the (Haryadi, S & Aprianoto, 2020) study revealed that pronunciation apps can give some advantages and positive effect for independent learning and participation in the classroom.

The next findings were drawn from the students' questionnaire. 85 % of the students said that they like using ELSA Speak for learning to pronounce, and 90 % of the students felt motivated and improved during using it.

The evidence mentioned highlights that ELSA Speak App can give more stimulus and input to the students in learning to pronounce even speaking. It is

very good and convenient to be utilized by the students in the classroom. Also, it is a new app providing many features like students' grades in English from beginner to advance. The teacher can use it anytime for supporting in pedagogical design also.

CONCLUSION

From the results and discussion proposed in the previous section, it was clear that ELSA Speak application can support and improve the students' pronunciation skills and motivation. This was proven by the performance of students and the scores obtained. The students can hear and imitate sounds as same as with the native language. The students' voice recording can be received in the system immediately to be corrected as the good one. Indeed, the students can increase the English vocabulary. This app can successfully make the students' engage in language learning. Indeed, in the practice, students can effectively involve in process of learning and got more motivation during utilizing the ELSA Speak Application in the pronunciation class. The features available on ELSA Speak app can enable the students have the independence to easily find out the lots of vocabulary and phrases of English in the native form. Also, it gave more facilities like building communicative work, self-learn activities, and speech correction. The students obtained more knowledge about the structures of English and even English pronunciation input. They knew the mistakes made and revised

directly. For last, concerning the use of technology in language teaching, there must be some consideration in accordance with the students' readiness and the app used. The appropriate app choices toward the language skills should be regarded before using it in teaching and learning in order to make learning be effective and efficient. Technology was just supplementary in language teaching. The English teachers cannot neglect their English competence itself. The key to how to make language teaching become a success was also from the teachers' pedagogy how teachers can manage and handle the classroom activities. Moreover, teachers should know the students' needs and want. Finally, English teachers should regard the ELSA SPEAK App as the proper technology for teaching pronunciation skills

REFERENCES

- Ahmad, J. (2012). English Language Teaching (ELT) and Integration of Media Technology. *Procedia - Social and Behavioral Sciences*, 47(Balaaco 1996), 924-929. <https://doi.org/10.1016/j.sbspro.2012.06.758>
- Baker, A., & Burri, M. (2016). Feedback on second language pronunciation: A case study of EAP teachers' beliefs and practices. *Australian Journal of Teacher Education*, 41(6), 1-19. <https://doi.org/10.14221/ajte.2016v41n6.1>

- Carrier, M. (2017). Automated Speech Recognition in language learning: Potential models, benefits and impact. *Training Language and Culture, 1*(1), 46–61. <https://doi.org/10.29366/2017tlc.1.1.3>
- Crystal, D. (2003). English as a Global Language. In *Cambridge University Press*. Cambridge University Press.
- Dodigovic, M. (2007). Artificial intelligence and second language learning: An efficient approach to error remediation. *Language Awareness, 16*(2), 99–113. <https://doi.org/10.2167/la416.0>
- Elimat, A., & AbuSeileek, A. F. (2014). Automatic speech recognition technology as an effective means for teaching pronunciation. *The JALT CALL Journal, 10*(1), 21–47. <https://doi.org/10.29140/jaltcall.v10n1.166>
- Fatemeh, A. (2014). Technology and english language pronunciation. *Indian Journal of Fundamental and Applied Life Sciences ISSN:, 4*, 461–465.
- Fathi Sidig Sidgi, L., & Jelani Shaari, A. (2017). The Usefulness of Automatic Speech Recognition (ASR) Eyespeak Software in Improving Iraqi EFL Students' Pronunciation. *Advances in Language and Literary Studies, 8*(1), 221. <https://doi.org/10.7575/aiac.all.v.8n1.p.221>
- Fouz-González, J. (2020). Using apps for pronunciation training: An empirical evaluation of the English File Pronunciation app. *Language Learning and Technology, 24*(1), 62–85. <https://doi.org/10.125/44709>
- Fouz González, J. (2012). *Can Apple's iPhone Help to Improve English Pronunciation Autonomously? State of the App. August 2012*, 81–87. <https://doi.org/10.14705/rpnet.2012.000031>
- Gerald, K. (2001). *How to Teach Pronunciation* (second). Longman.
- Guskaroska, A. (2019). *ASR as a tool for providing feedback for vowel pronunciation practice*. Iowa State University.
- Haryadi, S, H., & Aprianoto, A. (2020). Integrating “English Pronunciation” App Into Pronunciation Teaching: How It Affects Students' Participation and Learning. *Journal of Languages and Language Teaching, 8*(2), 202. <https://doi.org/10.33394/jollt.v8i2.2551>
- Hincks, R. (2003). Speech technologies for pronunciation feedback and evaluation. *ReCALL, 15*(1), 3–20. <https://doi.org/10.1017/S0958344003000211>
- J.D. O'Connor. (1998). *Better English Pronunciation* (twentieth). Cambridge University Press.

- Joanne, K. (1988). *Teaching English Pronunciation*. Longman. 0025
- Joy Calvo Benzie, Y. (2017). Contributions of new technologies to the teaching of English pronunciation. *Language Value*, 9(9), 1-35. <https://doi.org/10.6035/languagev.2017.9.2>
- Kannan, J., & Munday, P. (2018). New trends in second language learning and teaching through the lens of ICT, networked learning, and artificial intelligence. *Circulo de Linguistica Aplicada a La Comunicacion*, 76, 13-30. <https://doi.org/10.5209/CLAC.62495>
- Liakin, D., Cardoso, W., & Liakina, N. (2015). Learning L2 pronunciation with a mobile speech recognizer: French/y/. *CALICO Journal*, 32(1), 1-25. <https://doi.org/10.1558/cj.v32i1.25962>
- Neri, A., Cucchiari, C., & Strik, H. (2008). The effectiveness of computer-based speech corrective feedback for improving segmental quality in L2 Dutch. *ReCALL*, 20(2), 225-243. <https://doi.org/10.1017/S0958344008000724>
- Pokrivcakova, S. (2019). Preparing teachers for the application of AI-powered technologies in foreign language education. *Journal of Language and Cultural Education*, 7(3), 135-153. <https://doi.org/10.2478/jolace-2019->
- Richards, J. C. (2015). The changing face of language learning: Learning beyond the classroom. *RELC Journal*, 46(1), 5-22. <https://doi.org/10.1177/0033688214561621>
- Sarmita Samad, I., & Aminullah, A. (2019). Applying ELSA Speak Software in the Pronunciation Class: Students' Perception. *Edumaspul - Jurnal Pendidikan*, 3(1), 56-63. <https://doi.org/10.33487/edumaspul.v3i1.85>
- Tergujeff, E. (2012). English Pronunciation Teaching: Four Case Studies from Finland. *Journal of Language Teaching and Research*, 3(4), 599-607. <https://doi.org/10.4304/jltr.3.4.599-607>
- Tlazalo Tejada, A. C., & Basurto Santos, N. M. (2014). Pronunciation Instruction and Students' Practice to Develop Their Confidence in EFL Oral Skills. *PROFILE Issues in Teachers' Professional Development*, 16(2), 151-170. <https://doi.org/10.15446/profile.v16n2.46146>
- Underwood, J. (2017). Exploring AI language assistants with primary EFL students. *CALL in a Climate of Change: Adapting to Turbulent Global Conditions - Short Papers from EUROCALL 2017*, 2017(2017), 317-321. <https://doi.org/10.14705/rpnet.2017>

eurocall2017.733

Xodabande, I. (2017). The effectiveness of social media network telegram in teaching English language pronunciation to Iranian EFL learners. *Cogent Education*, 4(1), 1-14. <https://doi.org/10.1080/2331186X.2017.1347081>