

Using Podcasts to Improve Students' Listening Skills for Vocational High School

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Abstract. *The study investigated the impact of using podcasts to improve student listening skills at SMK Dian Indonesia. Through pre-experimental quantitative techniques with purposive sampling, the study aims to assess the impact of podcasts on student listening abilities. Twenty students from Class X at SMK Dian Indonesia participated in this study, which aims to determine whether podcasts can improve listening skills and introduce new learning media to schools. For data collection, pre-test and post-test were used. Utilizing a T-test sample coupled with SPSS, the results showed a significant difference between pre-test and post-test scores. The post-test scores (79.75) were significantly higher compared to the pre-test scores (70.60). These findings highlight the positive influence podcasts have on students' listening comprehension and language skills. By integrating podcasts into English learning activities, educators can create a dynamic and effective learning environment that supports students in improving their listening skills and overall language expertise. The study emphasizes the potential of podcasts as a media to improve students' listening skills in vocational high school. Implications of research suggest that combining podcasts can offer diverse content and context for students to practice listening.*

Keywords - listening skill , podcast, English learning

Abstrak. *Penelitian ini menyelidiki dampak penggunaan podcast untuk meningkatkan kemampuan mendengarkan siswa di SMK Dian Indonesia. Melalui teknik kuantitatif pra-eksperimental dengan pengambilan sampel secara purposif, penelitian ini bertujuan untuk menilai dampak podcast terhadap kemampuan mendengarkan siswa. Dua puluh siswa dari Kelas X di SMK Dian Indonesia berpartisipasi dalam penelitian ini, yang bertujuan untuk mengetahui apakah podcast dapat meningkatkan kemampuan mendengarkan dan memperkenalkan media pembelajaran baru ke sekolah. Untuk pengumpulan data menggunakan pre-test dan post-test. Dengan menggunakan sampel T-test yang digabungkan dengan SPSS, hasil penelitian menunjukkan perbedaan yang signifikan antara skor pre-test dan post-test. Nilai post-test (79,75) secara signifikan lebih tinggi dibandingkan dengan nilai pre-test (70,60). Temuan ini menyoroti pengaruh positif podcast terhadap pemahaman mendengarkan dan kemampuan bahasa siswa. Dengan mengintegrasikan podcast ke dalam kegiatan pembelajaran bahasa Inggris, para pendidik dapat menciptakan lingkungan belajar yang dinamis dan efektif yang mendukung siswa dalam meningkatkan kemampuan mendengarkan dan keahlian bahasa mereka secara keseluruhan. Penelitian ini menekankan potensi podcast sebagai media untuk meningkatkan kemampuan menyimak siswa di sekolah menengah kejuruan. Implikasi dari penelitian ini menunjukkan bahwa menggabungkan podcast dapat menawarkan konten dan konteks yang beragam bagi siswa untuk berlatih menyimak.*

Kata Kunci - keterampilan mendengarkan, podcast, pembelajaran bahasa Inggris

I. INTRODUCTION

The development of listening skills is very important in language learning, as well as English in education. Four language skills must be learned by students, namely listening, speaking, reading, and writing skills. One of the important skills in learning a language is listening. Listening is a complex interactive process, interpreting what is heard and using linguistic knowledge to convey messages [1]. According to Brown, listening is a very important skill to learn. Therefore, students should not underestimate it, especially in school, because they are required to improve their listening skills. Many students have difficulty mastering listening skills. Azmi reveals some of the problems students when listening. First, the lack of vocabulary mastery makes it difficult for students to understand audio [2]. Second, accent differences can affect student understanding. Students will find it more difficult to understand the message if the material they hear does not come from the accent they are used to learning [3]. The third is rarely listening to something in English. Students who are unfamiliar with a foreign language cause significant listening problems. The fourth is unfamiliar vocabulary, which takes a long time for students to consider what vocabulary they hear and understand what is being said. Finally,

clear speaking speed is important for students to understand what topic is being talked about [4].

Therefore, teachers must prepare well for the media that will be used to teach English, especially for listening skills. In addition, technology as a media can not replace the conventional education system involving parents, teachers, and schools; rather, they can assist teaching through the use of various tools [5]. According to Jobirovich, digital technology can help facilitate teachers' work activities and improve students' knowledge, skills, qualifications, and competencies. [6]. Through the integration of digital technologies, teachers can customize learning experiences to meet individual student needs. This personalized approach can lead to more effective teaching strategies and better learning outcomes [7]. In recent years podcasts have emerged which are in great demand and are listened to, especially by the millennial generation. Assuming that students learn in a variety of ways, podcasting provides a means for teachers to communicate instructions to students who have auditory and visual learning styles [8]. A podcast is a type of audio file that can be played or downloaded from various online and offline platforms. A podcast is "a multimedia digital file available on the internet for downloading to portable media players, computers, etc." According to The New Oxford American Dictionary (Oxford University Press), "Podcast" comes from the words "iPod" and "broadcast" [9]. Usually, podcasts consist of a series of episodes that can be accessed through certain podcast platforms or applications [10]. By watching several podcasts, students can learn many things and improve their listening skills. There is a wide selection of topics that can be listened to, ranging from educational content, and current issues, to casual chats. With podcasts, it will be very useful for teachers to train students' skills and improve them [1]. Due to the combination of sounds that stimulate students' perception, it is stated that the use of audio content improves students' listening skills [11].

There are several results obtained from previous research. First, the use of podcasts to show an increase in students' listening skills. Both of these average scores increased after the researchers treated the students for several meetings. This shows that all participants had a good experience with listening and learning through podcasts [12]. The second podcast has a significant effect on students' listening skills. After being treated with podcasts in listening teaching. On the other hand, not only students as research samples get positive impacts but also researchers as teachers. Researchers feel that teaching listening is easy and simple. Therefore, the use of podcasts has a positive impact because it can make listening teaching easier for teachers and make listening to English comfortable and enjoyable for students. The researchers recommended podcasts to be used during learning in class. As a result, they can improve their listening skills through regular practice [13]. Third the researchers found that podcasts as learning media can help students in improving comprehension and pronunciation skills. Therefore, the researchers suggested that teachers and students use podcasts as an alternative media to support learning activities and to encourage students' creativity and critical thinking [14]. From the results of previous studies, it show that podcasts can improve students' listening skills. Therefore, in this study the researchers decided to use a podcast with the type of news podcast, because it is related to the material to be learned. The chosen podcast channel is CBS Evening News, because this podcast discusses a lot of current news and is presented directly by native speakers so that it can train students' listening skills.

The results that researchers got during pre-observation at SMK Dian Indonesia were first, they had never applied podcasts as a media for learning English, especially in improving listening skills. Usually only use LCD and teaching sheets as supporting media for lesson plans in the learning process. RPP (lesson plan) is an important document that contains a description of how a lesson will be carried out for one meeting, one semester, or more. These lesson plans are usually prepared by teachers before starting learning activities at school [15]. English learning activities there are still not running well, because the lack of facilities makes English learning less optimal. The lesson plans encourage collaborative learning, joint research, and joint project development with academic institutions [16]. Second, some students feel that they still do not understand what they are learning in class. Therefore the researchers decided to try to apply podcasts as English learning media, especially to improve students' listening skills. In addition, SMK is a vocational school where students will practice more than theory and it is hoped that this media will be able to improve and practice students' listening skills both at school and outside of school. Because most vocational high school students usually choose to work directly or practice directly in the field it is hoped that podcasts can help skills in developing English language skills, especially listening. Thus, the research question that can be formulated in this research is,

Does the use of podcasts have an impact on improving students' listening skills at SMK Dian Indonesia?

II. METHODOLOGY

Research Design

The researchers chose one of the vocational high schools in Sidorjo as the place to conduct this research. This research uses a quantitative approach with a pre-experiment research design. Experimental research is research designed to conduct research objectively and under control so that maximum accuracy and conclusions can be reached regarding the hypothesis [17]. Data is collected using instruments that measure attitudes, and information is analyzed using statistical procedures and hypothesis testing [18]. The sampling used was a purposive sample.

Population and Sample

One of the vocational high schools in Sidorjo was where this quantitative research was conducted. Furthermore, the purposive sample method was used in this study. The subjects taken were not selected by level, but all who would be used as samples had the same initial ability but were not randomized or had the same background. This sample determination was carried out because the population members could be used as research samples. The population of this study was class X students of SMK Dian Indonesia with a total of 20 students selected as samples based on the criteria of research participants.

Data Collection and Techniques

To implement listening skills using podcasts, the researcher needed to conduct a pre-experiment class. This pre-experiment class consisted of 20 students, and the researcher's goal was to collect data during the class. This study used a listening test, at the time of the test, students listened to the podcast that had been provided and then students were asked to summarize and answer some questions from the podcast containing material about (news item). The listening test was conducted twice, namely before (pre-test) and after (post-test). Each question has questions that test students' skills in the listening aspect.

Pre-Test Steps

A test conducted before the sample is given the treatment is called a pretest. Before the treatment, this test aims to assess students' listening skills and knowledge. This test aims to assess students' listening skills before using podcast media to improve their listening skills. The test was conducted by giving audio to listen to and students were told to answer the questions that had been provided. The test was conducted by giving audio to listen to and students were told to answer the questions.

- :
 - a) Introduction
Introduce the concept of a news item and explain that today students will take a pre-test to measure their initial understanding, then play an audio about news items.
 - b) Discussion
Conduct a brief question and answer discussion related to the news item material.
 - c) Provide Instructions
Invite students to listen carefully to the audio once more, then distribute the pre-test sheet to students. Ask students to summarize what is being discussed.
 - d) Working on the pre-test
For the pre-test, students answer the questions after the podcast is played.
 - e) Collect
After students have finished working on the pre-test, students collect to the teacher.
 - f) Feedback
Give a brief summary of the narrative elements tested in the pre-test. Discuss examples of correct answers to help students understand the listening assessment criteria.
 - g) Reflection
Ask students to reflect on what they have learned from the pretest, and explain the assessment criteria for the assignment and presentation in the next meeting.

Treatment

Treatment is the process in which the research sample is given treatment to evaluate the effect of the independent variable on the research dependent variable. According to Purwanto, research instruments are basically tools used to collect data in research [19]. Treatment is used in this study to test the impact of using podcasts on students' ability to listen. After the pretest, this treatment is given as

a learning tool, by listening to audio podcasts in English.

a) Choosing Relevant Podcasts :

Select podcasts based on the comprehension and interest levels of the students. Make sure the content in the podcast aligns with the learning objectives or curriculum. The researchers chose a news podcast belonging to CBS Evening News, because it is in accordance with the material.

b) Give a brief overview of the podcast :

Show the class the podcast that will be used. Explain the theme of the podcast, the learning objectives and how listening skills can be improved through the podcast.

c) Prior Knowledge Activity:

Engage in activities to increase students' basic understanding of the subject matter to be covered in the podcast. Discuss any experience or understanding they have on the topic.

d) Purpose of the podcast :

Explain the purpose of this podcast. Students are expected to be able to identify sources of information, understand concepts or respond reflectively to this podcast.

e) Listen together :

Listen to the podcast together as a group. Assume that students have easy access to understand the information. Gently offer your help to discuss or clarify.

f) Interactive Activities:

Once you're done listening, engage students in interactive activities in the form of question and answer sessions, or written assignments related to the podcast topic.

g) Feedback and Correction:

Provide constructive criticism on the impact felt by students, correct the assignment together, and then ask again if there is any material that has not been understood.

Post-test step

The post-test is a test given to students after the treatment to measure their skills or knowledge about what they want to achieve. The purpose of the post-test of this study is to find out whether students' listening skills improve significantly after being given podcasts as a media to teach them to listen. The results of the post-test will be compared with the results of the pre-test to determine whether podcasts can help students in vocational high school in terms of improving listening skills.

a) Introduction

Explain that today's students will do a post-test to measure their listening understanding after being treated using the podcast.

b) Discussions

Ask short questions and answer discussions related to the news item material.

c) Give instructions

Ask students to listen to the podcast carefully, then distribute the post-test sheet to the students.

d) Collecting

After the student has finished working on the post-test, the student collects to the teacher.

e) Feedback

Gives a summary of the narrative elements tested in the post-test. Discuss examples of correct answers to help students understand hearing assessment criteria.

f) Reflection

Ask students to reflect on what they have learned from the post-test.

Data Analysis

Quantitative analysis was used to examine the data. The podcasts were given with the aim of measuring the improvement of their listening ability from the pre-test and post-test; in other words, data analysis was done to get a better understanding of the data from the pre-test and post-test. To find out whether the listening test can improve students' listening skills, the researchers used SPSS with the pre-experiment formula to compare the results of the pre-test and post-test.

The hypothesis in this research:

H0 : The use of podcast does not improve students' listening skills.

H1 : The use of podcast improves students' listening skills.

If the significance value of t-test < 0.05, then H0 is rejected, meaning that there is a significant influence between one independent variable on the dependent variable. If the significance value of t-test > 0.05, then H0 is accepted, meaning that there is no significant influence between one independent

variable on the dependent variable.

III. FINDINGS AND DISCUSSION

A. Heading number two

This research finding is related to the classification of students' pre-test and post-test scores. To answer the research question, researchers gave questions at least twice. The pre-test was given before researchers applied podcast media to measure listening skills, while the post-test was given after researchers applied podcast media. The results of the pre-test and post-test can be used to answer questions related to the research. The results of the pre-test and post-test can answer the main question of this study, namely are podcasts effective for improving students' listening skills at SMK Dian Indonesia.

Descriptive Statistic

Descriptive statistics show the student scores, minimum and maximum scores, mean scores, and standard deviation collected. These values were determined from the pre-test and post-test scores. The pretest and posttest data that has been collected is then compiled using Excel and calculated to determine the number of scores of each student and the average value of each student. Based on the results of the analysis, the value data was obtained before treatment (pretest) and after treatment (posttest).

Table 1. Result of the Pre-test and Post-test

No	Student Name	Pre-test	Post-test
1	AAP	70	75
2	AYE	70	80
3	APM	73	85
4	BS	71	75
5	BDC	70	80
6	DA	68	75
7	DP	78	85
8	EPB	78	82
9	FMI	65	75
10	HPQ	60	86
11	IP	70	80
12	JPP	70	85
13	LNA	75	82
14	MS	75	80
15	MPP	76	80
16	MAW	65	75
17	ND	70	80
18	PI	68	75
19	RHS	62	70
20	ZJ	78	90

Table 1 shows the results of the above analysis, it can be seen the comparison of the mean scores of the pretest and posttest, as well as the change in the standard deviation value. This helps in understanding the effectiveness of the treatment given to students

Table 2. The result of the Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std.

					Deviation
Student Pretest	20	60	78	70.60	5.144
Student Posttest	20	70	90	79.75	4.962
Valid N (listwise)	20				

In Table 2, it is shown that the average score of the students' pre-test was 70.60, while the average score of the students' post-test was 79.75. It is indicated that the students' average score was increased by about 9.15 points after the failure. It is shown by this progress that a significant and effective opportunity to improve their understanding or performance was had by students. The standard deviation for the pre-test score was 5.144 and for the post-test score was 4.962. The smaller standard deviation on the post-test indicates that the scores of students were more consistent after the treatment.

Table 3. Result of the Normality Test

Tests of Normality						
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Student pre-test	.154	20	.200*	.943	20	.273
Student post-test	.181	20	.086	.941	20	.249

Table 3 shows if the significance value (Sig.) is greater than 0.05, then researchers fail to reject the null hypothesis, which states that the data is normally distributed. If the significance value is smaller or equal to 0.05, then we reject the null hypothesis, indicating that the data is not normally distributed. Based on the results from the Kolmogorov-Smirnov and Shapiro-Wilk tests, the researchers concluded that the pretest and posttest scores were normally distributed. Therefore, the data meets the assumption of normality.

Table 4. Result of the T-test Paired Samples Test

		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		T	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Student pretest - Student posttest	-9.150	4.987	1.115	-	-6.816	-8.205	19	.000
					11.484				

Table 4 shows an average difference of 9,150 points between the pretest and posttest scores, the posttest scores were on average 9,150 points higher than the pretest scores. Rejecting the null hypothesis (Ho), which states that there is no difference between pretest and posttest scores because the significance value (p-value) of 0.000 indicates that the difference is highly statistically significant ($p < 0.05$). This result shows that students' learning outcomes improved significantly after doing the posttest. This increase shows that teaching listening using podcasts has a positive impact on student learning outcomes. Thus, the increase in posttest scores shows that teaching listening skills with podcasts is effective in improving listening skills.

Discussion

The research conducted by the researchers focused on the use of podcast media to improve student listening skills at SMK Dian Indonesia. By introducing podcasts as a learning tool, students can improve their listening understanding, thereby demonstrating the effectiveness of this approach in educational settings. This is consistent with previous research that has highlighted the benefits of using podcast-based media to improve language learning skills. The findings are linked to the findings of [11], who found that using podcasts in class can help students learn English faster, especially their ability to listen to it. The researchers suggested that podcasts should be used during class sessions so that students can practice better listening skills [13]. Podcasts can offer a wide range of content and topics, so students can practice listening in a variety of contexts and improve their overall language skills [20]. By integrating podcasts into language learning activities, educators can create a dynamic and effective learning environment that supports students in improving their hearing understanding and overall language skills. According to Jobirovich, digital technology can make the job easier for teachers and improve the knowledge, skills, qualifications, and rewards of students [21]. In conclusion, the study emphasizes the potential of podcast media as a medium to improve students' listening skills in vocational high school.

Based on the results of research and hypothesis testing, the use of podcasts as a learning medium has an impact on the ability of SMK Dian Indonesia students to listen. Results from both the pre-test and post-test show this, with the results after-testing better than pre-tests. The main objective of this study is to find out whether using podcasts can improve students' listening skills. Before therapy begins, pre-examination tests are performed to measure student listening ability. After the data is collected, the SPSS program is used to analyze the data. The pre-test results in an average score of 70.60, which shows the average student score before the podcast. After the treatment, students were given the opportunity to try podcasts as a tool to improve their listening skills. In addition, the average student score after the test was 79.75, indicating that the score had improved from the previous pre-test.

IV. CONCLUSION

Based on the findings presented in the article regarding the utilization of podcasts to enhance students' listening skills at SMK Dian Indonesia, it can be concluded that incorporating podcast media in language learning activities has a positive impact on students' listening comprehension and overall language proficiency. The study demonstrated that the use of podcasts as a learning tool led to a significant improvement in students' listening skills, as evidenced by the higher post-test scores compared to pre-test scores. Furthermore, the research highlighted the effectiveness of podcasts in creating a dynamic and engaging learning environment that supports students in developing essential listening skills. By integrating podcasts into the curriculum, educators can provide students with interactive listening materials that cater to different learning styles and offer a wide range of content and topics for practice.

Overall, the study underscores the potential of podcast media as a valuable tool for improving students' listening skills in vocational high schools. By encouraging regular engagement with podcasts, teachers can foster autonomous learning, continuous improvement, and the development of critical listening skills essential for academic and professional success. For further research, researchers can conduct studies to explore the long-term effects of podcast use on students' listening skills and also investigate the impact of podcast use combined with other teaching methods to determine whether podcasts can improve students' listening skills and have an effect on students' language learning outcomes.

REFERENCE

- [1] A. Raihani Siti Ikrima and D. Nahartini, "The effect of using podcast audio-assisted listening to

- improve listening comprehension," J. English Lang. Pedagog., vol. 6, no. 1, pp. 27–38, 2023.
- [2] Fahri Husaini, Y. Yulitriana, E. Karani, and M. Norahmi, "Effect of "Learn \\\", EBONY J. English Lang. Teaching, Linguist. Lit., vol. 4, no. 1, pp. 62–71, 2024, doi: 10.37304/ebony.v4i1.10988.
- [3] N. Yurko and I. Styfanyshyn, "Listening Skills in Learning a Language: the Importance, Benefits and Means of Enhancement," Репрезентація Освітніх Досягнень Мас-Медіа Та Роль Філології У Сучасній Системі Наук (1st Ed), pp. 38–46, 2022, doi: 10.36074/rodmmrfsn.ed-1.04.
- [4] W. R. Agarid and M. Nurzahra, "Analyzing Podcast Application To Improve Listening Ability," Proj. (Professional J. English Educ., vol. 1, no. 3, p. 175, 2018, doi: 10.22460/project.v1i3.p175-180.
- [5] I. Journal and I. Education, "International Journal of Indonesian Education and Teaching <http://e-journal.usd.ac.id/index.php/IJNET> Sanata Dharma University, Yogyakarta, Indonesia," vol. 3, no. 1, pp. 128–136, 2019.
- [6] E. Salainti and W. R. Pratiwi, "the Role of Digital Technology in Supporting Students' Listening Skills Through Digital Music Platforms and Podcasts: a Literature Review," Klasikal J. Educ. Lang. Teach. Sci., vol. 3, no. 3, pp. 72–79, 2021, [Online]. Available: <https://turbofuture.com>
- [7] Y. Astutik, S. Agustina, F. Megawati, and R. Anggraini, "Increasing English teachers' innovation through training on teaching modules development with digital technology integration," J. Community Serv. Empower., vol. 4, no. 3, pp. 459–466, 2023, doi: 10.22219/jcse.v4i3.27579.
- [8] Ramli, "The Use of Podcast to Improve Students' Listening and Speaking Skillsfor EFL Learners," Adv. Soc. Sci. Educ. Humanit. Res., vol. 145, no. Iconelt 2017, pp. 189–194, 2018, [Online]. Available: http://www.learnenglish.org.uk/prof_mp3/city-
- [9] N. K. Mohammed Al-Mohawes, "The Impact of Using Podcast Episodic Series of Spoken-Word Digital Audio on Improving Imam University EFL Beginners Listening Skills," Arab World English J., no. 298, pp. 1–43, 2023, doi: 10.24093/awej/th.298.
- [10] I. Rahmawati and Y. P. B. Sianturi, "Audio Podcast-based Learning Media in Improving Students' Listening Comprehension and Pronunciation," Journal of Research in Business, Economics, and Education, vol. 3, no. 5, pp. 133–139, 2021, [Online]. Available: <http://e-journal.stie-kusumanegara.ac.id>
- [11] M. S. Hadi, L. Izzah, and D. Maesari, "Improve Students' Listening Comprehension Through Podcasts," J. Ilm. Pendidik. Profesi Guru, vol. 4, no. 3, pp. 414–421, 2021, doi: 10.23887/jippg.v4i3.39838.
- [12] Y. Nugrahini and K. Rahmadhani, "The effectiveness of English Podcast for fourth semester students' listening ability at Universitas Bhinneka PGRI," vol. 4, no. 1, pp. 2620–410, 2021.
- [13] T. Wulandari et al., "Borneo Journal of Language and Education THE EFFECTIVENESS OF STUDENTS ' LISTENING SKILL BY USING PODCAST AT THE SECOND GRADE OF SMK NEGERI 6," vol. I, no. 1, pp. 27–40, 2021.
- [14] D. Indahsari, "Using podcast for EFL students in language learning," JEES (Journal English Educ. Soc., vol. 5, no. 2, pp. 103–108, 2020, doi: 10.21070/jees.v5i2.767.
- [15] R. M. Aguss, D. Amelia, Z. Abidin, and P. Permata, "Pelatihan Pembuatan Perangkat Ajar Silabus Dan Rpp Smk Pgr 1 Limau," J. Soc. Sci. Technol. Community Serv., vol. 2, no. 2, p. 48, 2021, doi: 10.33365/jsstcs.v2i2.1315.
- [16] J. Thompson et al., "Launching Networked PLCs: Footholds Into Creating and Improving Knowledge of Ambitious and Equitable Teaching Practices in an RPP," AERA Open, vol. 5, no. 3, pp. 1–22, 2019, doi: 10.1177/2332858419875718.
- [17] D. Gile, "Experimental research," Res. Transl. Interpret., no. January, pp. 220–228, 2015, doi: 10.30574/wjarr.2022.16.3.1152.
- [18] J. W. Creswell and J. D. Creswell, Mixed Methods Procedures. 2018.
- [19] M. G. Purwanto, A. Suhandi, B. Coştu, A. Samsudin, and M. Nurtanto, "Static Fluid Concept Inventory (SFCI): A Gender Gap Analysis using Rasch Model to Promote a Diagnostic Test Instrument on Students' Conception View project Conceptual Change and Mental Model in the Physics Conceptions View project Static Fluid Concept Inv," Int. J. Adv. Sci. Technol., vol. 29, no. 6, pp. 3798–3812, 2020, [Online]. Available: <https://www.researchgate.net/publication/341435769>
- [20] A. History, "Using podcast as a strategy to improve efl students' listening skill," vol. 08, no. 2, pp. 119–127, 2022, doi: 10.32682/jeell.v8i2.2150.
- [21] Y. M. Jobirovich, "The Role Of Digital Technologies In Reform Of The Education System," vol. 03, no. 04, pp. 461–465, 2021.

Conflict of Interest Statement:

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