

Vol. 4, No. 1, 2024, 68–77 https://e-journal.uingusdur.ac.id/erudita p-ISSN: 2809-2023; e-ISSN: 2809-2465

EnglishScore app practices: fostering EFL students' listening skills through English test

Azizah Maulina Erzad^{⊠1}, Suciati²</sup>

^{1,2} Institut Agama Islam Negeri Kudus, Central Java, Indonesia

E-mail: azizahmaulina@iainkudus.ac.id (corresponding author)

ABSTRACT

Listening is one of the English skills that EFL students struggle with. Various English listening audio can be used as listening materials. However, doing a listening test can be an alternative to enhance listening skills. This study highlights how the EnglishScore app affects listening skills and the benefits and drawbacks of using it. A gualitative study was conducted in this research. Eighty-four EFL students who took the listening subject filled out an open-ended questionnaire using Google Forms to collect the data. Observation and documentation were also used as data collection techniques. The research findings revealed that the students practiced using the EnglishScore app at least twice to know their improvements. Most participants acknowledged that they had a good impact on their listening skills. This app provided benefits by providing various listening materials, training the students to become autonomous learners, and managing their time well. Meanwhile, the drawbacks were that there needed to be corrections or feedback, including the potential for technical problems and the need for accommodating different learning styles or the diverse proficiency levels in the classroom.

ARTICLE INFO

Article history: Received: March 15, 2024 Revised: May 17, 2024 Accepted: May 22, 2024

Keywords:

EnglishScore; EFL students; English test; Listening skill

To cite this article: Erzad, A. M., & Suciati. (2024). EnglishScore app practices: Fostering EFL students' listening skills through English test. *Erudita: Journal of English Language Teaching*, 4(1), 68–77. https://doi.org/10.28918/erudita.v4i1.8532

To link to this article: https://e-journal.uingusdur.ac.id/erudita/article/view/erudita416



Copyright © 2024 Author(s). This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Introduction

Proficiency in English as a Foreign Language (EFL) is becoming increasingly important for success in the workplace, in school, and today's worldwide society. Listening comprehension is one of the vital fundamental qualities required for successful English communication (Namaziandost et al., 2019). Accurate spoken language comprehension is made possible by proficient listening abilities, which improve understanding and communication in various situations (Gilakjani & Sabouri, 2016).

However, there are many obstacles to EFL learners' development of their listening abilities. The obstacles can make the students anxious (Suciati, 2020). Conventional

instructional techniques may need to address listening comprehension's dynamic and participatory aspects sufficiently. Furthermore, the development of listening ability is made more difficult by elements like different linguistic backgrounds, insufficient practice opportunities, and a lack of exposure to authentic spoken English. These difficulties have prompted technological advancements to revolutionize language acquisition (Shirmatov, 2024).

Technologies that have emerged in response to these difficulties are starting to transform language instruction and learning. Mobile phone-based applications are essential for learning listening skills. Mobile phone-based applications provide learners with ubiquitous access to listening materials (Booton et al., 2023). With smartphones being nearly omnipresent, learners can practice listening skills anytime and anywhere, enhancing consistent practice opportunities (Jordan, 2023). Interactive features in the mobile app, such as gamification, progress tracking, and reward systems, can motivate learners (Afful & Boateng, 2023). Instant feedback on tests and exercises encourages learners to engage with listening tasks, facilitating skill development actively.

Learners can also control their learning time, re-learning material as needed and accommodating different learning styles and speeds. In addition, mobile apps often integrate audio with visual components such as images, text, and video. Students can finally encourage self-directed learning habits that continue beyond formal educational institutions (Brandt, 2020). Those conditions mean that mobile applications are crucial in improving listening skills by providing convenient access to authentic learning materials, personalized learning experiences, and opportunities for continuous practice and improvement.

Several studies show that education in the future will use digital technology (Gibson, 2015; Qureshi et al., 2021). Mainly, mobile applications provide dynamic, adaptable, and flexible platforms that meet various learning requirements (Alsied, 2022). The EnglishScore App is one example of an application combining language learning and assessment using structured learning modules and tailored feedback.

The EnglishScore App offers a fresh method of developing EFL students' listening abilities. By utilizing the app's features, teachers can improve their students' listening skills in several ways. Moreover, the automatic assessment of English is a vital reform direction for future English teaching and evaluation (Li, 2021). This app can be used everywhere, so the students are not limited to the class existence (Damanik et al., 2023). Thus, this study seeks to close this gap by investigating how the EnglishScore App practices support the development of EFL students' listening skills. By examining how the EnglishScore app affects students' attitudes and listening comprehension skills, this study aims to offer essential insights into pedagogical practices that can enhance EFL instruction in the digital era.

There are several previous studies related to the EnglishScore app. The first is predicting English language learners' proficiency level using EnglishScore Android application. This mobile application provides students with an accessible and convenient way to assess their English language proficiency through tests that cover grammar, vocabulary, reading, and listening skills (Anton, 2021). The second is whether using the EnglishScore application effectively improves students' vocabulary mastery (Syahada & Sari, 2024). This means that the research on this application is still limited and needs to be done in depth. Therefore, this

study not only aimed at the implementation of EnglishScore app but also identifying the its benefits and drawbacks.

Method

The researchers employed a qualitative study. According to Creswell and Creswell (2018), qualitative methods rely on text and image data, have unique steps in data analysis, and draw on diverse designs. In qualitative study, the researcher interprets words or pictures to describe the central phenomenon under study and the result may be a description of individual people or places (Creswell, 2014). In this study, the data are not numbers or charts but in the form of sentences. Thus, this research belongs to qualitative research. This study investigated how the EnglishScore app affects students' listening skills. The benefits and drawbacks of using the EnglishScore app were also revealed in this study.

This study participants were all English education department students who took Critical Listening subject in the third semester. The total number of students taking Critical Listening subject was 89 students from three classes: A, B, and C. However, only 65 students were willing to participate and fill out the questionnaire.

Observation, open-ended questionnaire, and documentation were employed by the researchers to collect the data. The researchers observed the use of EnglishScore app by the students in the classroom. An open-ended questionnaire was used through Google Forms. Meanwhile, several documents were collected, including photos, a list of students' names, and a listening subject schedule.

This study employed an analysis model developed by Miles and Huberman (1994) to analyze the data: data reduction, display, and verification. In data reduction, the researchers selected and focused on the appropriate data in this study. Then, the process of displaying the data came after data reduction. The researcher displayed the data collected through data reduction. Descriptions, matrices, graphs, charts, and flowcharts can be used to display data. Verifying the data came last in the data analysis process. The researchers confirmed the conclusions of the study as well. Then, the researchers eventually summed up the findings once the data had been examined and displayed.

Findings and discussion

Best practices of EnglishScore app to enhance listening skills

The data were collected through observation, questionnaire, and documentation techniques during the teaching and learning. The students from three classes of third-semester English department students taking the Critical Listening subject became the participants to be investigated related to their experiences in using the EnglishScore app. At the end of the semester, before the final exam, the teacher asked students to use the EnglishScore app to improve their listening skills and help them do the final exam easily. Since the students will do the TOEFL test in the end of the semester, using EnglishScore app will be helpful to improve their competence especially listening skills.

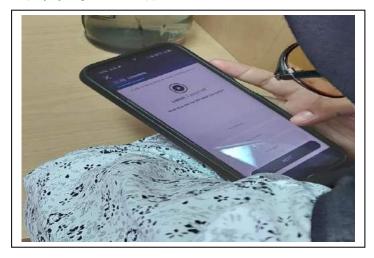
To improve their use of this application, the students should practice or do the exercise from EnglishScore twice. Thus, the teacher asked all the students to download the

EnglishScore app and practice it at home first. Then, they had the next meeting to practice it again in class for the second time to find out whether their scores improved or not. This application is handy for them, particularly for improving their listening skills.

Although this application is useful for English learners, it is less popular than other applications. Many students needed to learn about this app and had yet to use it. Therefore, at first the teacher introduced this app to students and the benefits of using it. Then, students were asked to download the app on their mobile phones. After that, teacher explained the rules and how to use this app. Students were directed to do the test by themselves at home as their first trial to know how far their competence is. Figure 1 below portrays the display of EnglishScore app:

Figure 1

Display of EnglishScore App



Even though they took the test at home, the teacher would not worry about them cheating, such as taking notes, opening a dictionary, or looking for answers on the internet. If they did so, they would lose, resulting in low scores or running out of time in the last question session. They cannot even take screenshots from their phones and will be warned when the slightest sound is around them. They should answer each question quickly to manage their time so they can complete the entire test. They can only play the audio up to 3 times for listening sessions.

The students were allowed to do the EnglishScore test more than once at home or outside the class. The second or the next test was held in the class based on their schedules for A, B, and C classes under the teacher's supervision. All students were asked to remember or write their previous score results. Then, they should compare their first or earlier results with the latest results to see whether there was any improvement or not.

Since the test can only be done using mobile phones, the students did the test by using their mobile phones and earphones to listen to the audio in the listening session. They should answer the listening session and all the test sessions to get the result score. After had finished to do grammar and reading sessions, they did the listening test as the last session. The app's adaptive technology personalizes the learning experience, allowing students to focus on areas where they need improvement. Figure 2 depicts the feature of playing audio in the listening sessions in the EnglishScore app.

Figure 2

EnglishScore: Playing Audio in Listening Section

Although this app is not specifically to examine listening skills and the result score do not show the listening competency, most of the students acknowledged that they got good impact for their listening skills after using this application. Their experiences in doing the test in this app helped them in the final exam for the listening subject. The following questionnaire data display the students' opinions about the EnglishScore app's benefits.

In the application, there are several questions about listening. With this we become trained in listening comprehension (Student 26, Questionnaire transcript).

In working on questions, there are also questions categorized or themed on listening aspects. So that with the use of this application, in my opinion, it is quite helpful for my personal learning process about listening skills (Student 31, Questionnaire transcript).

The EnglishScore application can improve my listening skills. It often includes audio exercises, conversations, and listening comprehension activities (Student 41, Questionnaire transcript).

There was a listening test and the audio could only be played 2x, it made me listen carefully (Student 50, Questionnaire transcript).

Yes, because by training yourself to listen and analyze the sentences spoken, you will further improve your listening skills (Student 54, Questionnaire transcript).

This app improved my listening skills. Because my hearing of English is quite difficult, maybe because I'm not used to listening to it, but with this application I can continue to learn to listen to English (Student 59, Questionnaire transcript).

Informed by the questionnaire data, listening comprehension is an essential skill for students to master English (Jusmaniar et al., 2023; Nurussyifa & Izzah, 2022). The subject of Critical Listening is taken by English students of third semester. One of the materials discussed in this subject is TOEFL. The TOEFL test also becomes the material for the final exam at the end of the semester. Thus, the students should prepare by practicing more exercises in English tests. Downloading the application of English tests is one of the ways to make the students practice more. Having an application to improve English skills in their handphones is the best choice for them to learn English anywhere and anytime. There are many English test applications that can be downloaded to practice doing TOEFL test. However, most of the listening applications provide the listening transcript or subtitle of the

audio (Nurussyifa & Izzah, 2022). That kind of application can make the user cheating when taking the listening test through mobile application.

Media-based techniques are relevant to technological advancements (Putri & Islamiati, 2018). Mobile phones can be used as a media for English teaching and learning process. Mobile phones may now easily access English learning applications, whether they are free or premium (Arumsari & Octaviani, 2022). EnglishScore is a test-based English learning application that can be accessed on mobile phones. It is almost the same with other TOEFL applications but there is no listening transcript like the other TOEFL test applications. It is suitable for students to use this app to improve their competence in doing English tests. The British Council authorizes this application. The EnglishScore app is not an application for enhancing Listening skills only. This app is like an app for doing English tests or TOEFL, which consists of some language skills. After downloading the application, the user should sign up by email.

The tests in this application can be done for free or paid if you want to get a certificate. You must register with an institution that offers an EnglishScore program. Then, you will get a schedule to do the test. It usually lasts two days; you can do the test on those days with two chances each day. The test organizer will automatically select the best score from your test. The score will consist of some scores of each skill, namely grammar, reading, and listening, which are almost the same as the TOEFL test.

The use of this media should be separate from teaching materials but included in learning so students can see the implementation of effective learning development strategies (Handayani & Izzah, 2020). This app was employed by the teacher in the Critical Listening class particularly in discussing TOEFL materials. Thus, the students were directed to do the Core Skills Test, which contains a listening test to practice and enhance their listening skills.

After choosing the Core Skills Test, they should select the option "I don't have a code" for they who take the test for free. The first session of the test is grammar and vocabulary, the second session is reading, and the last session is listening. The test lasts 30 to 40 minutes. Before starting to do the test, the application asks the test takers to check their device's audio and displays some rules on the screen. Due to the scope of this study, the discussion only focused on listening test sessions of the Core Skills Test in EnglishScore application.

The listening test is the third or last session of the Core Skills Test in the EnglishScore application. There are 11 questions in the listening test session. The test takers should answer each question in 1 minute and 15 seconds. The students or the test takers are only given two times or chances to play the audio for each question. The length of the audio is around 30 seconds. After the students finished to answer all the questions in the listening session, the result or final score of the whole test will appear directly. Unfortunately, the result did not show the specific score of listening test session.

However, the students acknowledged that the felt a good impact in their listening skill after using this application a few times (at least twice). Most of them got better score results in their second trial tests. This technology-based material greatly enhances students' development of speaking and listening skills since it requires them to pay attention to what they hear and interpret the message (Maulina et al., 2022).

Benefits and drawbacks of using the EnglishScore app in fostering listening skills

This sub-section deals with the second finding of the study. The author is required to present among those benefits; there were some drawbacks of using the EnglishScore app as well. The drawbacks were directly experienced by the students while using this application. The results of the students' open-ended questionnaires related to their views about the drawbacks of using the EnglishScore app are evidenced as follows:

There is no answer correction listed (Student 3, Questionnaire transcript).

The size is too large for my mobile phone (Student 5, Questionnaire transcript).

I feel rather difficult, and there's nothing discussion (Student 7, Questionnaire transcript).

The downside is that there is no discussion at the end (Student 11, Questionnaire transcript).

The downside may be that the time is too short (Student 14, Questionnaire transcript).

We cannot know the correct answer key and cannot evaluate ourselves (Student 17, Questionnaire transcript).

The data taken from observation, questionnaires, and documentation were gathered and synchronized to make a comprehensive finding. The researchers observed the teaching and learning process by themselves to know how the app employed by the students. The questionnaire and documentation supported the observation result and the triangulation techniques.

From the students' opinions, the EnglishScore application had several drawbacks. The first drawback was this application did not provide any corrections or feedback for each question in all sessions. There were no corrections, feedback, or answer keys for all sessions, including the listening session at the end of the test or when students had responded to all questions. This condition made the students curious about what part of their answer was wrong and what the correct answer was. At the same time, the second drawback was the limited chance to use this app. The students could use this application more times than they wanted. There are only two opportunities to use this application every day. The users can also only use it ten times in 28 days. In addition, the last drawback was that the application needed to be more significant when downloaded on a mobile phone.

Students find it rather enjoyable to acquire listening skills with smartphone applications (Sari et al., 2019). Students also give positive responses or feedback on listening app usage (Rama et al., 2022). After having experience using the EnglishScore app, the students gave their positive opinions. The topics in the listening audio are varied. The audio can be in the form of monologue or dialogue as well. The students can get various examples of questions in the listening session. This application can be employed anytime and anywhere but at most twice a day and ten times in 28 days. Since it can be used freely and flexibly, the use of mobile applications can make students become autonomous learners (Purwati, 2019). Furthermore, the students learn to manage their time well because every question has a certain amount of time to answer and play the audio twice.

Teachers can also use the app to track their students' progress, identify strengths and weaknesses, and tailor their instruction accordingly. Furthermore, EnglishScore provides an official certificate of English proficiency, which can be valuable for students' academic and professional pursuits (Guaqueta & Castro-Garces, 2018). By integrating EnglishScore into the

classroom, educators can enhance traditional teaching methods with technology, making language learning more engaging and effective (Ameri, 2020).

While the EnglishScore app offers several advantages for EFL classrooms, it also has some drawbacks. There is no perfect application without any negative sides. However, the presence of technology can only partially replace the humans' role (Kostka & Toncelli, 2023). The presence of a teacher is still required in the learning process. The existence of technology becomes a means in the learning process and can ultimately result in its beneficial integration in the educational setting.

One significant issue is the potential for technical problems. Students may encounter difficulties accessing the app or experience interruptions due to unstable internet connections, especially in areas with limited connectivity (Zou et al., 2022). Additionally, the app might not adequately accommodate different learning styles or the diverse proficiency levels found in a typical classroom. Some students might find the app's standardized format less engaging or suitable for their specific learning needs, potentially impacting motivation and effectiveness (Kim, 2021).

Conclusion

Some conclusion can be drawn from this study. The students practised using the EnglishScore app at least twice to know their improvements, particularly in listening skills. Most of the students acknowledged that they had a good impact on their listening skills. Moreover, this app provides many benefits for students, such as delivering various listening materials, training the students to become autonomous learners and managing their time well. Meanwhile, the drawbacks were there needed to be correction or feedback and limited chance to use this app. The implementation of the EnglishScore application in EFL classrooms has been uncovered in this study, along with its benefits and drawbacks. This research recommends this application usage for students self-learning to enhance their listening skills through doing an English test. Future studies should investigate another listening tool that can engage students and help them become better listeners on various topics. Further study on listening applications is needed to improve knowledge and information in the teaching listening skills.

Acknowledgements

We would like to acknowledge the participants and colleagues who have been involved in this study. We also would like to express the gratitude to the reviewers who have given contribution and feedback in improving this study.

References

Afful, D., & Boateng, J. K. (2023). Electronic learning among students at public universities in Ghana. *Cogent Education*, 10(2), 11–6. https://doi.org/10.1080/2331186X.2023.2222695

Alsied, S. M. (2022). The role of mobile phones as effective tools for language learning by Libyan EFL learners. *JEELS: Journal of English Education and Linguistics Studies*, 6(2), 135–164. https://doi.org/10.30762/jeels.v6i2.1234

- Anton, O. (2021). Predicting English language learners' proficiency level using EnglishScore android application. *Journal of Digital Ecosystem for Natural Sustainability (JoDENS)*, 1(2), 2798–6179. https://journal.uvers2.ac.id/index.php/jodens
- Ameri, M. (2020). The use of mobile apps in learning English language. *Budapest International Research and Critics in Linguistics and Education*, 3(3), 1363–1370. https://doi.org/10.33258/birle.v3i3.3780
- Arumsari & Octaviani, S. K. (2022). Duolingo mobile application for English listening skill improvement of vocational school students. *Journal of English Language and Education*, 7(2), 84–95. https://doi.org/10.31004/jele.v7i2.306
- Booton, S. A., Hodgkiss, A., & Murphy, V. A. (2021). The impact of mobile application features on children's language and literacy learning: a systematic review. *Computer Assisted Language Learning*, 36(3), 400–429. https://doi.org/10.1080/09588221.2021.1930057
- Brandt, W. C. (2020). *Measuring student success skills: A review of the literature on self- directed learning*. Center for Assessment.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed method approaches* (4th ed.). SAGE Publication.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE.
- Damanik, S. F., Nasution, N. S., Hasibuan, J. R., & Gintings, I. P. (2023). Development of android-based listening practice application (funny-fun & handy) with popular culture topic as an innovative learning media. *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran*, 9(4), 1206. https://doi.org/10.33394/jk.v9i4.9251
- Gibson, D., Ostashewski, N., & Flintoff, K. (2015). Digital badges in education. *Education Information Technology*, 20, 403–410. https://doi.org/10.1007/s10639-013-9291-7
- Gilakjani, A. P., & Sabouri, N. B. (2016). The significance of listening comprehension in English language teaching. *Theory and Practice in Language Studies*, 6(8), 1670. https://doi.org/10.17507/tpls.0608.22
- Guaqueta, C. A., & Castro-Garces, A. Y. (2018). The use of language learning apps as a didactic tool for EFL vocabulary building. *English Language Teaching*, 11(2), 61–71. http://doi.org/10.5539/elt.v11n2p61
- Handayani, A. E., & Izzah, L. (2020). Improving students listening comprehension with mobile app "English listening test." *English Language in Focus (ELIF)*, 3(1), 69–78. https://jurnal.umj.ac.id/index.php/ELIF/article/view/6090
- Jordan, K. (2023). How can messaging apps, WhatsApp and SMS be used to support learning? A scoping review. *Technology, Pedagogy and Education*, 32(3), 275–288. https://doi.org/10.1080/1475939X.2023.2201590
- Jusmaniar, N., Indahyanti, R., & J, N. A. (2023). *The use of Dictogloss technique through JOOX application to improve students' listening skill. Journal of English Language Issues, Trends, and Studies*, 1(3), 25–32. https://jurnal-fkip-uim.ac.id/index.php/verba/article/view/176
- Kim, H. (2021). The effect of mobile apps on vocabulary acquisition in EFL classroom. *International Journal of Advanced Culture Technology*, 9(4), 118–125. https://doi.org/10.17703/IJACT.2021.9.4.118
- Kostka, I., & Toncelli, R. (2023). Exploring applications of ChatGPT to English language teaching: Opportunities, challenges, and recommendations. *TESL-EJ: The Electronic Journal for English as a Second Language*, 27(3), 1–19. https://doi.org/10.55593/ej.27107int

- Li, J. (2021). The application of artificial intelligence technology in oral English assessment. *Proceedings of ICISCAE 2021: 2021 4th International Conference on Information Systems and Computer Aided Education* (pp. 1186–1189). ACM Digital Library. https://doi.org/10.1145/3482632.3483111
- Maulina, M., Ignacio, J. F., Bersabe, L. A. C., Serrano, A. J. D., Carpio, N. G., & Santos, E. G. D. (2022). Technology-based media used in teaching listening skills. *Exposure: Jurnal Pendidikan Bahasa Inggris*, 11(1), 85–99. https://doi.org/10.26618/exposure.v111.6564
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). SAGE Publications.
- Namaziandost, E., Neisi, L., Mahdavirad, F., Nasri, M., & Monacis, L. (2019). The relationship between listening comprehension problems and strategy usage among advance EFL learners. *Cogent Psychology*, 6(1), 1-22. https://doi.org/10.1080/23311908.2019.1691338
- Nurussyifa, N., & Izzah, L. (2022). Application of listening English practice in understanding listening for junior high school students. *Scripta: English Department Journal.* 9(2), 158–171. https://doi.org/10.37729/scripta.v9i2.2221
- Purwati, T. (2019). Using mobile application to promote autonomous learning for syntax subject. *E-Structural*, 1(02), 142–153. https://doi.org/10.33633/es.v1i2.2142
- Putri, L. M., & Islamiati, A. (2018). Teaching listening using TOEIC application. *PROJECT: Professional Journal of English Education*, 1(4), 486–491. https://doi.org/10.22460/project.v1i4.p486-491
- Qureshi, M. I., Khan, N., Raza, H., Imran, A., & Ismail, F. (2021). Digital technologies in education 4.0. Does it enhance the effectiveness of learning? *International Journal of Interactive Mobile Technologies*, 15(4), 31–47. https://doi.org/10.3991/IJIM.V15I04.20291
- Rama, A. N., Ahmad, D. R. P., & Nurwanti, N. (2022). The effect of English listening and speaking application on students' listening skill at Lakidende University. *Jurnal Pendidikan dan Konseling*, 4(3), 1166–1171. https://doi.org/10.31004/jpdk.v4i3.4740
- Sari, N. P., Susilowati, S., & Fadloeli, O. (2019). Improving listening skill using learn English by listening application. *PROJECT: Professional Journal of English Education*, 2(4), 455– 460. https://doi.org/10.22460/project.v2i4
- Shirmatov, S. T., & Akhmedova, G. M. (2024). Revolutionizing language learning with smart technologies. *Excellencia: International Multi-Disciplinary Journal of Education*, *o2*(06), 1165–1179. https://multijournals.org/index.php/excellencia-imje
- Suciati, S. (2020). Speaking anxiety in EFL classroom: Categories and factors. *Edulingua: Jurnal Linguistiks Terapan dan Pendidikan Bahasa Inggris*, 7(1), 39–45. https://doi.org/10.34001/edulingua.v7i1.1168
- Syahada, T., & Sari, S. Y. (2024). The effectiveness of English score application on preteaching activities to improve vocabulary mastery at *SMAN 8 Padang*. *Journal of English Language Teaching*, 13(1), 63–71. https://doi.org/10.24036/jelt.v13i1.127223
- Zou, C., Li, P. & Jin, L. (2022). Integrating smartphones in EFL classrooms: Students' satisfaction and perceived learning performance. *Education Information Technology*, 27, 12667–12688. https://doi.org/10.1007/s10639-022-11103-7