A Journal of Culture, English Language, Teaching & Literature
ISSN 1414-3320 (Print), ISSN 2502-4914 (Online)
Vol. 24 No.2; December 2024

Artificial Intelligence for EFL Students' Listening Skills

[1*)]Akmal, [2]Adi Budi Perkasa, and [3]Roslina Abdul Aziz

[1,2]Universitas Ahmad Dahlan, Jl. Pramuka 42. Sidikan, Yogyakarta, Indonesia

[3]Universiti Teknologi Mara Pahang Branch Bandar Tun Razak, Pahang, Malaysia

[1]akmal@mpbi.uad.ac.id, [2]adi2107042008@webmail.uad.ac.id, [3]leenaziz@uitm.edu.my

[*)] Corresponding Author

Artificial Intelligence for EFL Students' Listening Skills

[1*)]**Akmal,** [2]**Adi Budi Perkasa, and** [3]**Roslina Abdul Aziz**

[1]akmal@mpbi.uad.ac.id, [2]adi2107042008@webmail.uad.ac.id,
[3]leenaziz@uitm.edu.my

[1,2]Universitas Ahmad Dahlan, Jl. Pramuka 42. Sidikan, Yogyakarta, Indonesia

[3]Universiti Teknologi Mara Pahang Branch Bandar Tun Razak, Pahang, Malaysia

*) Corresponding author

Abstract: Text-to-Speech is an AI product that involves artificially producing human speech by converting text into voice using a speech synthesizer. The role of AI in ESL and EFL language instruction has been studied since 2010. However, to the best of the authors' knowledge, research on the effectiveness of text-to-speech-based (TTS) e-modules in enhancing the listening skills of EFL students in Indonesia is still limited. The aim of this study is to investigate the impact of Text-to-Speech-based e-modules (TTS e-modules) on the listening skills of EFL students in Indonesia. The TTS e-module was designed using the R & D research approach with the ADDIE model. The samples were 60 seventh-grade students of junior high school in Tasikmalaya, Indonesia. During the evaluation phase, a pre-post quasi-experiment was conducted. The findings, evaluated using the 100-point scale, indicate below-average pre-test mean scores for both the control group (41.87) and the experimental group (37.87). After the intervention (using a TTS e-module for one semester / 14 classroom sessions x 90 minutes), the mean for the control group was 52.13, while that of the experimental group mean score increased to 69.93. The independent sample t-test scores confirmed significant differences in achievement, as indicated by the p-value of 0.000< 0.05. This indicates that the null hypothesis was rejected. Positive student evaluations of the e-module further support the study's findings. The study concludes that the TTS e-module significantly improved the listening abilities of the participants. This research has implications for educators, students, and future scholars, and provides valuable insights into the innovative use of technology for language learning.

Key words: artificial intelligence, EFL, e-module, listening instruction, text-to-speech.

Abstrak: *Text-to-Speech adalah teknologi kecerdasan buatan (AI) yang melibatkan produksi ucapan manusia secara buatan dengan mengubah teks menjadi suara menggunakan penyintesis ucapan manusia. Peran AI dalam pengajaran bahasa ESL dan EFL telah dipelajari sejak tahun 2010. Namun, sejauh pengetahuan penulis, penelitian tentang efektivitas e-modul berbasis text-to-speech (TTS) dalam meningkatkan keterampilan mendengarkan jumlah pelajar EFL di Indonesia masih terbatas. Tujuan dari penelitian ini adalah untuk menyelidiki dampak e-modul berbasis Text-to-Speech (TTS e-modules) terhadap keterampilan mendengarkan siswa EFL di Indonesia. E-modul TTS dirancang menggunakan pendekatan penelitian pengembangan (RnD) dengan model ADDIE. Sampelnya adalah 60 siswa kelas tujuh SMP di Tasikmalaya, Indonesia. Pada tahap evaluasi, dilakukan eksperimen semu pra-pasca. Temuan tersebut, yang dievaluasi menggunakan skala 100 poin, menunjukkan skor rata-rata pra-tes di bawah rata-rata untuk kelompok kontrol (41,87) dan kelompok eksperimen (37,87). Setelah intervensi (menggunakan e-modul TTS selama satu semester / 14 sesi kelas x 90 menit), nilai rata-rata*

kelompok kontrol adalah 52,13, sedangkan nilai rata-rata kelompok eksperimen meningkat menjadi 69,93. Skor uji-t sampel independen mengkonfirmasi adanya perbedaan hasil yang signifikan, sebagaimana ditunjukkan oleh nilai p sebesar 0,000<0,05. Hal ini menunjukkan bahwa hipotesis nol ditolak. Evaluasi positif siswa terhadap e-modul lebih lanjut mendukung temuan penelitian ini. Studi ini menyimpulkan bahwa e-modul TTS secara signifikan meningkatkan kemampuan mendengarkan para peserta. Penelitian ini mempunyai implikasi bagi pendidik, siswa, dan cendekiawan, dan memberikan wawasan berharga mengenai penggunaan teknologi yang inovatif untuk pembelajaran bahasa.

Kata kunci: *kecerdasan buatan, EFL, e-modul, pembelajaran menyimak, text-to-speech*

INTRODUCTION

Listening stimulates human consciousness of the language as it is the first skill to be developed (Renukadevi, 2014). There is a strong correlation between listening skills and other language skills, as indicated by a Cronbach's alpha of 0.90 (Bozorgian, 2012). This means that llistening is a crucial part of language acquisition, but having good listening skills is difficult. Brown (2004) mentions that listening comprehension is challenging due to eight characteristics: clustering, redundancy, reduced forms, performance variables, colloquial language, stress, and interaction. At the same time, it is difficult for EFL teachers to integrate listening skills into the teaching and learning process, whether oriented towards listening as comprehension or listening as acquisition (Richards, 2008).

English in Indonesia is considered a foreign language/EFL (Mufidah, Yansyah & Jumadi, 2022). It is a compulsory subject first taught at the junior high school level (Zein *et al.*, 2020). In the EFL setting, where exposure to actual listening practice is limited, mastering listening skills can be difficult. (Nowrouzi *et al.*, 2015).

Several strategies to overcome the listening comprehension problem among EFL students include the top-down process (Hinkel, 2006), the bottom-up process (Richards, 2008), the use of context (Vandergrift, 2011), project-based learning (Ekawati et al., 2018), the use of multimedia (Nurhas *et al.*, 2021) and hiring native English speaker teachers (NEST). Native speaker idealism, however, has been a debatable issue (Quirk, 1990; Kachru, 1992; Dewi, 2017; Ruecker & Ives, 2015; Alghofaili & Elyas, 2017).

To address this concern, exposure to native English speakers can be achieved through the use of media technologies. Several studies have shown that media technologies are effective in enhancing language acquisition (Kuppens, 2010; Parvin & Salam, 2018; Benzies & Yolanda Joy, 2018; Halwani, 2017; Peters, 2018; Fathira & Utami, 2019; Nguyen, 2021; Lazebna & Prykhodko, 2021; Zhang, 2021). Educational technology, then, is able to provide an opportunity for learners to improve their listening proficiency (Nowrouzi *et al.*, 2015).

Artificial Intelligence (AI) technology offers a solution as it has the potential to be applied in classroom instruction. Text-to-Speech (TTS) is a key component of AI technology that involves the artificial production of human utterances by converting text into voice through a speech synthesizer (Mache et al., 2015). TTS technology began in the 1980s and has accelerated since then. Educational institutions and education researchers have started using TTS and related tools to assist students with literacy disabilities. The prevalence and quality of electronic versions of books and computer software with TTS capabilities have increased over the past two decades (Wood *et al.*, 2018). In the L2 and particularly the EFL context, TTS systems have the potential

to be used as pedagogical instruments when natural exposure to the target language is limited or non-existent (Bione and Cardoso, 2020). TTS has shown positive results for EFL instruction, such as emphasizing the perceptual dimensions of intelligibility and comprehensibility (Matsuda, 2017) and developing reading fluency and comprehension (Amin, 2022). TTS has had a significant impact on EFL assessment, particularly in dictation (Chiang, 2019). The ability of TTS to produce human-like voice quality makes it a valuable tool for creating resources that teach listening skills and expose students to the language of native speakers.

Another effect of digital technology on education is the increase in digital learning materials, such as e-modules. Digital texts, such as e-modules, are favorable to students due to the convenience and adaptability of the online medium and its comfort (Suwatra et al., 2018; Pardede, 2019). Similarly, e-modules can help students study independently and provide digital course materials that are highly interactive by employing multimedia, such as videos, audio, text, images, and animations. This flexibility allows students to study anywhere in offline or online modes, thereby enriching the educational experience for both students and teachers, besides promoting the efficiency of time and resources (Trilestari & Almunawaroh, 2021). The features of the e-module, particularly its ability to embed various media, mainly audio and video, open up possibilities for employing TTS in designing the Flip PDF application for listening instructions. This facilitates exposure to various native-like TTS-generated audio.

Despite the availability of various strategies to enhance EFL students' listening comprehension, teachers continue to face challenges in accessing suitable media and materials for listening instruction, and students struggle to find effective resources for independent listening practice (Richard, 2008). While exposure to native English speakers is beneficial, relying on native speaker teachers is often impractical, and issues related to native speaker idealism have sparked debate within EFL education (Quirk, 1990; Kachru, 1992; Dewi, 2017; Ruecker & Ives, 2015; Alghofaili & Elyas, 2017). The integration of AI technology, particularly Text-to-Speech, presents a promising solution by simulating native speaker input to support accessible, high-quality listening practice (Bione & Cardoso, 2020; Matsuda, 2017). TTS technology has demonstrated positive impacts across various language acquisition domains, yet its application within digital learning resources, such as e-modules for EFL listening instruction, remains underexplored (Suwatra et al., 2018; Pardede, 2019; Trilestari and Almunawaroh, 2021). This gap highlights a pressing need for innovation and research into TTS-integrated e-modules to determine their effectiveness in enhancing listening proficiency for Indonesian EFL learners. Testing these e-modules' ability to improve both receptive and productive language skills is crucial, as such innovation could significantly improve the accessibility and quality of EFL listening resources in Indonesia.

LITERATURE REVIEW

A. Instructional Design of the ADDIE model

ADDIE, which stands for Analyze, Design, Develop, Implement, and Evaluate, is a product development paradigm applied to intentional learning environments (Branch, 2009; Bakala and Bakala, 2020). ADDIE facilitates the complexities of deliberate learning environments by responding to multiple situations and interactions within and between contexts. Muruganantham (2015) defines each of the steps in the ADDIE approach as follows: First, the Analysis phase determines what will be developed in the product. Second, the Design phase

determines the product's performance and assessment. Third, the Develop phase generates content, selects, or develops media, and conducts formative revisions. The fourth phase is the Implementation phase, during which the product is implemented in a real environment. The fifth phase is the evaluation phase, during which the instructional goods and methods are assessed before and after implementation. The ADDIE development model provides a complete framework for a researcher before, during, and after the product is created.

B. Media for the Listening Classroom

In listening classroom activities, media can be categorized as live or recorded materials. (Nomozova & Ismoilova, 2022). Both live and recorded materials have advantages and disadvantages. Recorded materials for listening classrooms can expose learners to various English speakers and linguistic varieties. Recorded media can be effectively distributed, enriched with diverse content, and accessed by students at their convenience. Students can engage in discussions while listening to the materials, which also facilitates easier preparation for listening tasks. Moreover, the simplicity of recorded audio media increases learners' concentration on the language's phonology, improves pronunciation, and promotes listening comprehension. Audio-visual media stimulates both the ears and the eyes simultaneously, attracting students' attention and assisting them in relating information from the audio to the visuals provided for a deeper level of comprehension (Hardiah, 2019).

C. E-Module for Listening Classroom Materials

Numerous studies have demonstrated the positive impact of technology on language competencies, such as listening (Qasim & Al Fadda, 2013; Başal et al., 2015; Azar & Nasiri, 2014; Budianto et al., 2021). Listening materials that use digital technology as the medium have been proven to enhance teachers' listening instruction, be more effective, and improve listening skills compared to other types of media. Digital listening materials can also provide students with more opportunities to engage with natural language and can be one of their preferred learning methods. One example of the effect of digital technology on learning materials for education is the emergence of e-modules.

An e-module is an electronic module that can be used on digital gadgets, such as smartphones, tablets, electronic notebooks, laptops, and desktop computers (Yulando et al., 2019). It provides a more detailed description of media, which is the digital development of printed modules resulting from the advancement of digital technology. They can be designed interactively and engagingly to achieve specific goals and competencies. It is an independent learning material systematically designed and presented in electronic form, which may include audio, animation, and navigation (Sugianto et al., 2017; Rochsun & Agustin, 2020; Handayani et al., 2021). The audio and video-embedded features of the e-module make it valuable for delivering audio-visual materials in the context of a listening classroom.

D. Text-to-Speech for Listening to Classroom Materials

AI refers to the capacity of machines and computers to imitate human thought and behavior (Wartman & Combs, 2018). TTS is one of the AI technologies that mimics human voice or verbal expression. TTS is defined as a system that can autonomously convert text into speech by arranging phonemes to form spoken words (Mattheyses and Verhelst, 2015). The human-like voice features open up possibilities for using the technology to create materials for language classroom instruction, such as listening exercises. The audio output of TTS can be used as an alternative to deliver classroom instructions for developing listening skills.

https://doi.org/10.24167/celt.v24i2; ISSN: 1412-3320 (print); ISSN: 2502-4914 (online); Accredited; DOAJ

TTS is a subset of Artificial Intelligence-Generated Content (AIGC) models that analyze, classify, and manipulate audio signals, including speech and music. AIGC refers to the use of AI to automate the process of creating information while meeting the individualized needs of users. The unprecedented capability of AIGC techniques to automate the creation of diverse content, such as text, images, and videos, has attracted considerable attention (Du *et al.*, 2023). Murf Studio is one of the human voice generators for audio-related AI-generated content. Murf Studio is a cloud-based text-to-speech platform that allows users to create AI-based voiceovers for a variety of purposes (*Murf Studio Docs | Easy way to get started with Murf Studio*, 2024).

E. Previous Studies on Artificial Intelligence for EFL Language Instruction.

Numerous studies have explored the use of AI to provide English instruction within the context of artificial intelligence in language education (AILEd). The following studies explore the use of artificial intelligence (AI) to enhance English language skills and language instruction components. Chen & Lee (2011) A study demonstrated the potential of an AI-powered human pulse detector to function as an emotional detection system for providing online English-speaking instructions.

The study effectively improved instructional methods by utilizing data to recommend relevant ways, along with coaching or feedback, to alleviate students' speaking anxiety. Ran et al. (2021) conducted a study that specifically examined the use of AI-based speech recognition in a spoken correction model. The goal was to improve the teacher's ability to provide efficient corrective feedback on students' English pronunciation while minimizing the time and effort required.

In another study, Amin (2022) found that employing Text-to-Speech technology for repeated reading (RR) and listening while reading (LWR) lessons effectively enhances students' reading fluency and comprehension. Next, Guo et al. (2023) revealed that incorporating a chatbot into argumentative writing classrooms offers valuable support, increased student engagement, and enhanced motivation. The chatbot provides scaffolding throughout all phases of the writing process, leading to improved learning outcomes. Lastly, a study by Fang and Hsiao (2018) stated that learners who engage in embodied learning within a virtual reality environment have better vocabulary success in listening than students who use physical body movement or do not participate in embodied learning.

RESEARCH METHOD

A. Research Design

The study adopts a research and development approach that utilizes the ADDIE model, which includes five phases: Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009; Aldoobie, 2015; Muruganantham, 2015). The Analysis phase involves a needs analysis in which the researchers conducted a semi-structured interview with English teachers, followed by a document analysis to determine the appropriate materials for the e-module. The design phase involved formulating competencies, learning objectives, materials, and instructions to be included in the listening e-module, based on the results of the analysis phase. In the third phase, the material scripts were developed into the predetermined e-module. In the fourth phase, the listening e-module was implemented with the experimental group over one semester or 14 meetings within 90 minutes. This primarily allowed for autonomous engagement based on the e-

module units. During this phase, a pre-test and post-test were conducted. During the evaluation phase, the effectiveness of the e-module was measured by analyzing the pre-test and post-test findings and assessing participants' perceptions of the listening e-module through a questionnaire adapted from Woottipong (2014).

B. Participants

The participants were selected using "convenience sampling," a non-probability or non-random sampling method in which subjects are chosen based on their accessibility, proximity, availability, and willingness to participate (Etikan, Musa & Alkassim, 2016). The researcher selected thirty students from the seventh grade at SMPN 1 Sukahening in Tasikmalaya Regency, Indonesia, who used digital devices daily as the experimental group. For the control group, the researcher selected thirty students with the same level from a different classroom. A seventh-grader was also selected as an interview participant. All participants willingly participated in the research and were informed that they could withdraw at any time.

C. Data Collection and Analysis

The researcher used qualitative and quantitative data analysis. Qualitative data were collected through a semi-structured interview with a teacher participant during the needs analysis phase. To ensure the validity of the data, the researchers will triangulate the interview data by member checking before translating it into English (Candela, 2019). The researchers analysed the results of the semi-structured interview using thematic analysis. The needs analysis interview examined the teacher's perceptions of listening, its practice, student competencies, supporting facilities, and materials. Quantitative data were obtained from the pre-test and post-test for the experimental and control groups. The tests were designed to determine the effectiveness of the e-module by measuring students' responsive and extensive listening skills. In addition, a questionnaire adapted from (2014) was used to gather students' attitudes towards the e-module. The instrument consisted of 17 questions using a five-point Likert scale that investigated participants' attitudes toward the e-module. The researchers evaluated participants' preferences for the e-module and their perceptions of its impact on their learning behaviour and language skills achievements. For data analysis, the researchers analysed the semi-structured interview transcripts using thematic analysis to reveal emerging themes. Descriptive statistics were used to obtain mean scores for the pre-test and post-test results using SPSS. An independent sample t-test was also conducted to determine if there was a statistically significant difference in mean scores between the two groups. The mean value will be converted into qualitative data by referring to the criteria summarised in Table 1

Table 1:
Conversion of Quantitative to Qualitative Data

Value of Mean Scores	Criteria
4.51-5.00	very feasible
3.51-4.50	feasible
2.51-3.50	fairly feasible
1.51-2.50	less feasible
1.50 or lower	not feasible

https://doi.org/10.24167/celt.v24i2; ISSN: 1412-3320 (print); ISSN: 2502-4914 (online); Accredited; DOAJ

FINDINGS AND ANALYSIS

The findings of the study are systematically presented through the ADDIE model which stands for Analysis, Design, Development, Implementation, and Evaluation. Each phase of the ADDIE model was crucial in guiding the research process, ensuring a comprehensive and methodical approach to developing and assessing the TTS e-module.

A. Results from the Analysis Phase

Responses from the semi-structured interview revealed that, although the teacher conducted listening lessons regularly, they felt that most students still need additional listening materials. The teachers stated that conducting an effective listening classroom is time-consuming because they have to repeat the listening materials for students to comprehend. Moreover, readily available listening materials that suit the students' level of proficiency and are designed following the competencies outlined by the syllabus are scarce, forcing the teacher to prepare her/his own listening materials. The insights gained from the interview highlight the need for more textbooks, materials, or media that teachers can use to conduct effective listening lessons. It also indicates a lack of readily available, integrated listening content for immediate use. Although students are interested in audio-visual materials, presenting the media is challenging due to inadequate material selection and school facilities.

Moreover, based on document analysis, the e-module was determined to focus on four purposes: greeting, leave-taking, thanking, and apologizing, which are classified as basic interpersonal communication expressions in English, and this is in alignment with the 2013 Indonesian curriculum (Dinata & Basid, 2022). The TTS e-module includes intensive, responsive, selective, and extensive listening activities.

After analyzing the results of the analysis phase, the researcher formulated learning competencies, materials, objectives, and instructions to be included in the listening e-module. The standard competencies were taken from the Indonesian 2013 English curriculum for seventh-grade junior high school students. The TTS e-module titled "Listen to Nature" comprises three units: Unit 1, entitled "Listen to the Forest", Unit 2, "Listen to the River", and Unit 3, "Listen to the Sea" (as shown in Table 2).

Table 2:
Standard competencies and materials of the E-module.

No	Standard Competency	Material
1	3.1. Understand the social function, text structure, and linguistic elements in expressions of greeting, leave-taking, thanking, and apologizing, as well as their responses, according to their contextual use.	Unit 1 Greeting Listen to the Forest. Unit 2 Leave-Taking Listen to the Forest.
2	4.1. Create simple spoken texts to express and respond to greetings, leave-taking, thanking, and apologizing while considering their social functions, text structure, and linguistic elements that are appropriate and contextual.	Unit 3 Thanking and Apologising Listen to the river. Sea

https://doi.org/10.24167/celt.v24i2; ISSN: 1412-3320 (print); ISSN: 2502-4914 (online); Accredited; DOAJ

Each TTS e-module unit consists of seven learning objectives achieved through activities and practices. Each unit comprises pre-activity, while-activity, and post-activity, aligning with the listening classroom strategy suggested by Kumar (2021). These activities are designed to maximize students' experience and comprehension while also ensuring materials are systematically arranged. The pre-activity introduces the material's focus and concept, connecting it with students' prior knowledge. The while-activities provide intensive, responsive, selective, and extensive listening practice, and the post-activities include reflective questions for the students regarding their achievements and a collaborative task to arrange a dialogue based on the material learned (refer to Appendix 1).

The analysis was conducted using the testing instrument in the e-module. The test consisted of 17 questions, comprising 11 that assessed responsive listening skills and 6 that assessed extensive listening skills. The questions were generated through audio, while the answer sheet used Google Forms. The validity and reliability of the instruments were analyzed by conducting Pearson correlation and Cronbach alpha analyses (exhibited in Appendix 2). The Pearson correlation analysis generated scores of over 0.254 within a sample size of 60. Based on the r-table value, all questions were considered valid. The Cronbach alpha analysis revealed that the reliability score of all questions was more than 0.6, indicating that the reliability is at a moderately acceptable level (Shamsuddin et al., 2015; Hair et al., 2019).

B. Design

The next phase is to create an e-module by combining the PDF, audio, and video components. The design template for the e-module's layout was imported in PDF format. In the edit mode of the Flip PDF application, audio, video, and quizzes were added to the e-module. Using the published feature (refer to Figure 3), the researchers transformed the e-module into a website application.

Figure 1:
Flip PDF Listening e-module.

C. Develop

In the Develop phase, the researchers transformed the design into scripts, which were then differentiated into text and audio scripts. Text scripts consist of topics, introduction, instructions, questions, and answer choices. In comparison, the audio scripts consisted of short-spoken expressions and longer scripts, such as monologue and dialogue, derived based on the topics and themes. Subsequently, the researchers converted the platform to transform the text scripts into a PDF file. Words, short spoken expressions, icons, and pictures were also included. They were used to play the audio and pop out the questions and answers of the quizzes based on this template. Some images served as the background, while others were used as illustrations. All of these images are related in some way to the topics covered in the e-module. A Text-to-Speech website platform, Murf, was used for the audio scripts (refer to Figure 4). The scripts were converted into video animations, and some of the audio was used to create video animations.

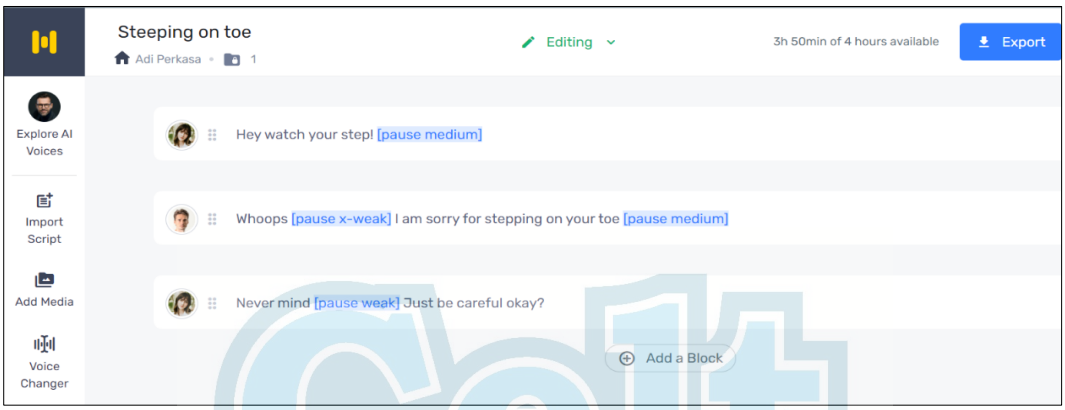

Figure 2:
A platform that generates text

D. Implementation

Before implementing the e-module on March 17, 2023, the researcher conducted a pre-test to measure the students' listening skills. Following the pre-test , a preparation guide was provided for students to use the e-module. The classroom activity aimed to introduce the e-module to the seventh-grade students in the experimental group who participated in the research implementation. First, the researcher explained the research topic, procedure, and purpose of the study to the students.

Secondly, the researcher created a WhatsApp group for communication and distribution between him and the participants. Thirdly, the researcher distributed Unit 1 of the e-module, instructed the students to install it on their mobile phones, and provided an overview of how to use it. After the students have understood their tasks and how to use the e-module, they were asked to complete all the practice in Unit 1 within a week at home and report the results by capturing their mobile phone screen after answering the quiz in the e-module.

The students completed Unit 1 on April 6, 2023, Unit 2 on April 12, 2023, and Unit 3 on May 1, 2023, respectively. For the control group, the researcher assigned an English teacher to conduct a conventional listening classroom covering the same materials as the e-module with similar time constraints.

E. Evaluation

The post-test was conducted on May 6, 2023. "Descriptive statistics for the pre-tests and post-tests, using a 100-point scale, are presented in Table 4. As shown in the table, the pre-test mean for the experimental group was 37.87, while the pre-test mean for the control group was 41.87. Results from the post-test showed that the experimental group recorded a mean score of 66.93, whereas the control group's mean score was only 52.13. Post-test scores for both the experimental and control groups were higher than their pre-test levels. The post-test score of the experimental group was higher than that of the control groups. The scores of the experimental group showed a significant improvement, indicating that the TTS e-module is effective in enhancing listening abilities.

Table 3:
Descriptive Statistics of the Pre-Test and Post-Test Scores

		Control Group Listening Pre-test	Control Group Listening Post-test	Experimental Group Listening Pre-test	Experimental Group Listening Post-test
N	Valid	30	30	30	30
	Missing	0	0	0	0
Mean		41.87	52.13	37.87	66.93
Median		40.00	54.00	36.00	64.00
Mode		40	60	36	56
Std. Deviation		10.801	15.094	9.438	10.448
Minimum		24	24	20	52
Maximum		68	84	56	92

A normality test was conducted following the independent sample t-test using SPSS 25. The independent sample t-test was performed as a parametric statistic. Thus, a normality test was conducted to ensure that the data were appropriate for analysis. Since the df value was less than 50, the normality assumption for the test's normality as conducted following the Shapiro-Wilk section (Ghasemi & Zahediasl, 2012). Based on the *p-values* of the control group (0.367) and the experimental group (0.211), which were greater than 0.05 (refer to Table 4), it was concluded that the post-test results were normally distributed. Assuming normality, the researcher compared the means of the post-test results between the experimental and control groups to analyze significant differences (refer to Table 5).

Table 4:
Shows the Normality Test

Test of Normality							
		Kolmogorov-Smirnov			Shapiro-Wilk		
	Group Type	Statistic	df	sig.	Statistic	df	Sig.
Score Total Post-Smirnov	Control Group	.128	30	.200	.963	30	.367
	Experimental Group	.165	30	.037	.954	30	.211

https://doi.org/10.24167/celt.v24i2; ISSN: 1412-3320 (print); ISSN: 2502-4914 (online); Accredited; DOAJ

Table 5:
Presents the Statistical Analysis of the Post-Test

Group Statistics					
	Group Type	N	Mean	Std. Deviation	Std. Error Mean
Score Total Post-test	Experimental Group	30	10,80	2,265	,414
	Control Group	30	7,63	3,489	,637

When comparing the experimental and control groups, the SPSS results show that the Levene's Test for Equality of Variances is 0.048 (Table 6), less than 0.05. This indicates that the data variance is not homogeneous between the two groups. Therefore, the numbers in the 'Equal variances not assumed' table serve as a guide for interpreting the independent samples t-test result table (Chan, 2003). If, in the "Independent Samples Test" output table, the value of Sig. (2-tailed) is 0.00 < 0.05 in the "Equal variances not assumed" row. This indicates a statistically significant difference between the post-test scores of the experimental and control groups. This suggests that the experimental group benefited from the Text-to-Speech-based e-module in terms of listening comprehension.

Table 6:
Post-Test Independent T-test Analysis

Independent Sample Test										
Levene's Test for Equality of Variances		t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Score Total Post-Smirnov	Equal variances assumed	4,008	,048	4,170	58	,000	3,167	,759	1,646	4,687
	Equal variances not assumed			4,170	49,761	,000	3,167	,759	1,641	4,692

The results of the evaluation phase show that the Cronbach alpha values range from 0.611 to 0.622, indicating that all the questions have met the moderate reliability criteria. The arithmetic means (X) calculated using the Likert scale data revealed the students' attitudes toward e-module instructions.

The mean score of the students' attitude toward the e-module ranged from 3.37 to 4.20 for each item. Only one question, number 11, "I think the listening e-module will affect my learning," scored 3.37, a fairly feasible criterion. The remaining questions 1, 2, 3, 4, 5, 6, 7, 8, 10, 13, 14, 15, 16, and 17, received scores above 3.5, a feasible criterion. The average of all the items' answers is 3.85, referring to the feasible criteria (as seen in Appendix 3).

https://doi.org/10.24167/celt.v24i2; ISSN: 1412-3320 (print); ISSN: 2502-4914 (online); Accredited; DOAJ

DISCUSSION

Among the non-linguistic problems in EFL teaching and learning in Indonesia is listening to native speakers' speaking speed (Amir et al., 2019; Malaikosa & Taopan, 2020; Ghoneim, 2017; Underwood, 1989) outlined that it is a potential problem that could hinder listening comprehension.

Iintensive listening activities are challenging because teachers must also teach other language skills simultaneously. The TTS e-module provides students with more opportunities for English due to its feature of encouraging self-directed learning and self-navigation, making the e-module platform user-friendly (Manalastas & De Leon, 2021). Students can access the e-module on their digital devices without any time or space constraints and without depending on the teacher. This practice means that the teacher becomes more of a facilitator to support the students' active learning, which is one of the advantages of the e-module (Istuningsih, Baedhowi and Sangka, 2018). As revealed in the findings, live listening, where the listener is directly exposed to speakers and their utterances (Nomozova and Ismoilova, 2022). Using an e-module, the teacher was able to provide sufficient exposure to various types of English input, ensuring optimal acquisition and proficiency maintenance. In multicultural social and professional situations, it is vital to understand multiple variations of English for communicating with people who speak other languages (Passakornkarn & Vibulphol, 2020).

TTS technologies promote native-like speech, offering the benefit of authentic language exposure in a language classroom (Mulyono & Vebriyanti, 2016) As such, they enhance students' motivation for learning and foster the authenticity of the language acquisition process (Major *et al.*, 2002). Furthermore, a synthesized voice that closely resembles human speech is generally more desirable and less disconcerting (Kühne, Fischer & Zhou, 2020). In addition to accents, TTS platforms like Murf offer a range of voice characters that can be customized for their speech genres, emotions, ages, genders, and useful pauses to simulate human speech dynamics and make it more realistic, increasing listener engagement. The experimental students perceived that the TTS e-module could expose them to native English variations that were not present in their classroom setting, enhancing their learning experience.

The results of the pre-test showed that the control group outperformed the experimental group, but in the post-test, as a result of the intervention, it was found that the experimental group performed better than the control group. This finding indicates that the combination of Flip PDF and Text-to-Speech platforms can improve students' listening abilities. This finding is consistent with the research done by Moon (2020) who also reported the effectiveness of the TTS-based listening material toward listening competency. Students' evaluations support the effectiveness of the TTS e-module and its potential impact on their learning outcomes. Thus, the TTS e-module has improved participants' ability to listen responsively and extensively. At the instructional level, rresponsive listening requires attentiveness and emphasizes learners' auditory reactions, which necessitate good listening and comprehension (Gu, 2018). In comparison, extensive listening aims for long-term, complete, and delightful hearing input with long-term goals like academic content, enjoyment, and so on (Renandya & Farrell, 2011; Gu, 2018). The research evaluated participants' responsive and extensive listening to examine the impact of the e-module on students' readiness to become active learners in English language acquisition within a foreign language context.

Research by Moon (2020) revealed that a significant proportion of the participants perceived the TTS assisted listening materials as beneficial in reducing listening-related anxiety,

improving self-assurance and motivation, and ultimately contributing to the enhancement of their listening proficiency. Learners' satisfaction can be attributed to several advantageous aspects of TTS-based listening materials. These include the ability to select desired learning content, ease of information access, the presence of various native speaker voices, and the novelty of using digital tools. Similarly, the students in the experimental group expressed their preference for the TTS e-module over the conventional textbook for both in-class learning activities and self-directed study.

CONCLUSION

The study concludes that the TTS e-module significantly improved the listening abilities of the participants. This research has implications for educators, students, and future scholars, providing valuable insights into language education, teaching methods, instructional design, and future research. Innovation from teachers is needed to overcome the problem of EFL learners. Teachers can create e-modules for different language skills, adjust complexity, and address issues related to the lack of comprehensible listening materials. incorporating educational technology into various instructional purposes. The researchers encourage further investigation into using the TTS e-module on a larger sample scale in a similar language setting, due to the limited sample size involved in this research.

ACKNOWLEDGMENT

The researchers would like to thank the research center and community service of Universitas Ahmad Dahlan, Yogyakarta, for the research grant, and the school principal of Tasikmalaya Junior High School, West Java, for the research permit. Our deepest appreciation also goes to the English language teachers who have devoted their time and energy to participating in the research.

REFERENCES

Aldoobie, N. (2015) 'ADDIE model', *American International Journal of Contemporary Research*, 5(6), pp. 68–72. Available at: https://ph02.tci-thaijo.org/index.php/itm-journal/article/view/240513.

Alghofaili, N.M. & Elyas, T. (2017) 'Decoding the Myths of the Native and Non-Native English Speakers Teachers (NESTs & NNESTs) on Saudi EFL Tertiary Students', *English Language Teaching*, 10(6), p. 1. Available at: https://doi.org/10.5539/elt.v10n6p1.

Amin, E.A.-R. (2022) 'Using repeated-reading and listening -while-reading via Text-to-Speech APPs. in developing fluency and comprehension', *World Journal of English Language*, 12(1), pp. 211–220. Available at: https://doi.org/10.5430/wjel.v12n1p211.

Amir, R.M., Salija, K. & Weda, S. (2019) 'English Listening Problems Faced By Students At an Indonesian Senior High School', *International Journal of Teaching and Education*, 5(2), pp. 2–15.

Azar, A.S. & Nasiri, H. (2014) 'Learners' attitudes toward the effectiveness of mobile assisted language learning (MALL) in L2 listening comprehension', *Procedia - Social and Behavioral Sciences*, 98, pp. 1836–1843. Available at: https://doi.org/10.1016/j.sbspro.2014.03.613.

Bakala, A. & Bakala, M. (2020) 'E-learning course design in ADDIE methodology as a process in BPMN 2.0.', *Informatyka Ekonomiczna Business Informatics*, 4(58), pp. 21–32. Available at: https://doi.org/DOI: 10.15611/ie.2020.4.02.

Başal, A., Gülözer, K. & Demir, İ. (2015) 'Use of video and audio texts in EFL listening test', *Journal of Education and Training Studies*, 3(6), pp. 83–89. Available at: https://doi.org/http://dx.doi.org/10.11114/jets.v3i6.1001.

Benzies, C. & Joy, Y. (2018) 'Contributions of new technologies to the teaching of English pronunciation', *Language Value*, 9(1), pp. 1–35. Available at: https://doi.org/10.6035/languagev.2017.9.2.

Bione, T. & Cardoso, W. (2020) 'Synthetic voices in the foreign language context', *Language Learning and Technology*, 24(1), pp. 169–186. Available at: https://doi.org/10.125/44715.

Bozorgian, H. (2012) 'Listening skill requires a further look into second/foreign language learning', *ISRN Education*, 2012, pp. 1–10. Available at: https://doi.org/10.5402/2012/810129.

Branch, R.M. (2009) *Instructional design: The ADDIE approach*, *Encyclopedia of Evolutionary Psychological Science*. Springer. Available at: https://doi.org/10.1007/978-0-387-09506-6.

Brown, H.D. (2004) *Language Assessment Principles and Classroom Practices*, *Pearson Education, Inc.* Available at: https://doi.org/10.4324/9781315717173-46.

Budianto, L., Azmi, M. & Putera, A.A. (2021) 'The implementation of digital storytelling using discovery learning in EFL listening class: Middle school students' and teachers' voices', *Journal on English as a Foreign Language*, 11(2), pp. 381–399. Available at: https://doi.org/10.23971/jefl.v11i2.3036.

Candela, A.G. (2019) 'Exploring the function of member checking', *The Qualitative Report*, 24(3), pp. 619–628. Available at: https://doi.org/10.46743/2160-3715/2019.3726.

Chan, Y.H. (2003) 'Biostatistics 102: Quantitative data - parametric & non-parametric Tests', *Singapore Medical Journal*, 44(8), pp. 391–396. Available at: https://medicine.nus.edu.sg/rsu/wp-content/uploads/sites/15/2020/02/biostat102_resources4.pdf.

Chen, C. & Lee, T. (2011) 'Emotion recognition and communication for reducing second-language speaking anxiety in a web-based one-to-one synchronous learning environment', *British Journal of Educational Technology*, 42(3), pp. 417–440. Available at: https://doi.org/10.1111/j.1467-8535.2009.01035.x.

Chiang, H.-H. (2019) 'A comparison between teacher-led and online text-to-speech dictation for students' vocabulary performance', *English Language Teaching*, 12(3), pp. 77–93. Available at: https://doi.org/10.5539/elt.v12n3p77.

Dewi, A. (2017) 'The english(Es) to teach after study and life in Australia: A study of indonesian

english language educators', *Asian Englishes*, 19(2), pp. 128–147. Available at: https://doi.org/10.1080/13488678.2017.1279762.

Dinata, R.P. & Basid, M.A. (2022) 'An analysis of material completeness in english textbook "When English Rings A Bell" of junior high school', *Jurnal Ilmiah Dikdaya*, 12(2), pp. 452–460. Available at: https://doi.org/10.33087/dikdaya.v12i2.338.

Du, H., Li, Z., Niyato, D., Kang, J., Xiong, Z., Xuemin, Shen & Kim, D.I. (2023) 'Enabling AI-generated content (AIGC) services in wireless edge networks', *arXiv preprint arXiv:2301.03220*, pp. 1–8.

Etikan, I., Musa, S.A. & Alkassim, R.S. (2016) 'Comparison of Convenience Sampling and Purposive Sampling', *American Journal of Theoretical and Applied Statistics*, 5(1), pp. 1–4. Available at: https://doi.org/https://doi.org/10.11648/j.ajtas.20160501.11.

Ghasemi, A. & Zahediasl, S. (2012) 'Normality tests for statistical analysis: A guide for non-statisticians', *International Journal of Endocrinology and Metabolism*, 10(2), pp. 486–489. Available at: https://doi.org/10.5812/ijem.3505.

Ghoneim, M.M. & A (2017) *Egyptian EFL Students Attitudes and Perceptions as Precursors of the Success / Failure of Using Podcasts as a Means of Aural Input in a Metacognitive Awareness Raising Strategy Training Programme , with Particular Reference to Listening* May Mohamed *Ghonei*. Cardiff Metropolitan University.

Gu, Y. (2018) 'Types of listening', in *The TESOL Encyclopedia of English Language Teaching*. 8 Volume S. John Wiley & Sons, Inc, pp. 1–6. Available at: https://doi.org/10.1002/9781118784235.eelt0570.

Guo, K., Li, Yuanke, Li, Yongyan, Kai, S. & Chu, W. (2023) 'Understanding EFL students ' chatbot-assisted argumentative writing : An activity theory perspective', *Education and Information Technologies*, 29(1–20). Available at: https://doi.org/10.1007/s10639-023-12230-5.

Hair, J.F., Page, M. & Brunsveld, N. (2019) *Business Research for the Twenty-First Century*. Fourth Edi, *Essentials of Business Research Methods*. Fourth Edi. New York: Routledge. Available at: https://doi.org/10.4324/9780429203374-1.

Halwani, N. (2017) 'Visual aids and multimedia in second language acquisition', *English Language Teaching*, 10(6), p. 53. Available at: https://doi.org/10.5539/elt.v10n6p53.

Handayani, D., Elvinawati, Isnaeni & Alperi, M. (2021) 'Development of guided discovery based electronic module for chemical lessons in redox reaction materials', *International Journal of Interactive Mobile Technologies*, 15(7), pp. 94–106. Available at: https://doi.org/10.3991/ijim.v15i07.21559.

Hardiah, M. (2019) 'Improving Students Listening Skill by Using Audio Visual Media', *Allughah, Language Journal*, 7(2), pp. 39–49. Available at: https://doi.org/https://doi.org/10.29300/lughah.v7i2.1673.

Hinkel, E. (2006) 'Current Perspectives on Teaching the Four Skills', *TESOL Quarterly*, 40(1), p. 109. Available at: https://doi.org/10.2307/40264513.

Istuningsih, W., Baedhowi, B. & Sangka, K.B. (2018) 'The effectiveness of scientific approach using e-module based on learning cycle 7E to improve students' learning outcome', *International Journal of Educational Research Review*, 3(3), pp. 75–85. Available at: https://doi.org/10.24331/ijere.449313.

Kachru, B.B. (1992) 'State of the art article World Englishes : approaches , issues and resources', *Language Teaching*, 25(1), pp. 1–14.

Kühne, K., Fischer, M.H. & Zhou, Y. (2020) 'The human takes it all: Humanlike synthesized voices are perceived as less eerie and more likeable. Evidence from a subjective ratings study', *Frontiers in Neurorobotics*, 14(December), pp. 1–15. Available at: https://doi.org/10.3389/fnbot.2020.593732.

Kumar, G.P. (2021) 'A study on pre-listening and post-listening activities of English among first year foreign students of Osmania University Engineering College', *International Journal of Multidisciplinary Educational Research*, 10(7), pp. 77–81. Available at: https://doi.org/DOI: http://ijmer.in.doi./2021/10.07.201 ISSN:2277-7881;

Kuppens, A.H. (2010) 'Incidental foreign language acquisition from media exposure', *Learning, Media and Technology*, 35(1), pp. 65–85. Available at: https://doi.org/10.1080/17439880903561876.

Lan, Y.-J., Fang, W.-C., Hsiao1, I.Y.T. & Chen, N.-S. (2018) 'Real body versus 3D avatar : The effects of different embodied learning types on EFL listening comprehension', *Educational Technology Research and Development*, 66, pp. 709–731. Available at: https://doi.org/10.1007/s11423-018-9569-y.

Lazebna, N. & Prykhodko, A. (2021) 'Digital discourse of English language acquisition', *Journal of Language and Linguistic Studies*, 17(2), pp. 971–982. Available at: https://doi.org/10.52462/jlls.67.

Mache, S.R., Baheti, M.R. & Mahender, C.N. (2015) 'Review on Text-to-Speech Synthesizer', *I International Journal of Advanced Research in Computer and Communication Engineering*, 4(8), pp. 54–59. Available at: https://doi.org/10.17148/IJARCCE.2015.4812.

Major, R.C., Fitzmaurice, S.F., Bunta, F. & Balasubramanian, C. (2002) 'The effects of nonnative accents on listening comprehension: Implications for ESL assessment', *TESOL Quarterly*, 36(2), p. 173. Available at: https://doi.org/10.2307/3588329.

Malaikosa, C.A. & Taopan, L.L. (2020) 'Teaching English at junior high school in Indonesian rural area : The implementation of scientific approach', *Lensa: Kajian Kebahasaan, Kesusastraan, dan Budaya*, 10(2), pp. 206–217. Available at: https://doi.org/https://doi.org/10.26714/lensa.10.2.2020.206-217.

Manalastas, R.S. & De Leon, S.P. (2021) 'Development and evaluation of electronic instructional module in matter', *European Journal of Humanities and Educational Advancements*, 2(8), pp. 107–127. Available at: https://scholarzest.com/index.php/ejhea/article/view/1175.

Matsuda, N. (2017) 'Evidence of effects of Text-to-Speech synthetic ipeech to improve second language learning', *JACET Journal*, 61, pp. 149–164. Available at: http://www.jacet.org/JACET_Journal_No61/JACET_Journal_61_09.pdf.

Mattheyses, W. & Verhelst, W. (2015) 'Audiovisual speech synthesis: An overview of the state-of-the-art', *Speech Communication*, 66, pp. 182–217. Available at: https://doi.org/10.1016/j.specom.2014.11.001.

Moon, D. (2020) 'Learner-generated digital listening materials using Text-to-Speech for self-directed listening practice', *International Journal of Internet, Broadcasting and Communication*, 12(4), pp. 148–155. Available at: https://doi.org/http://dx.doi.org/10.7236/IJIBC.2020.12.4.148.

Mufidah, N., Yansyah & Jumadi (2022) 'Survival foreign language acquisition strategies during the emergency remote learning: An exploratory study in molding Indonesian students' creativity', *Frontiers in Education*, 7(March 2020), pp. 1–9. Available at: https://doi.org/10.3389/feduc.2022.901282.

Mulyono, H. & Vebriyanti, D.N. (2016) 'Developing native-like listening comprehension materials perceptions of a digital approach', *Journal of ELT Research*, 1(1), p. 1. Available at: https://doi.org/10.22236/jer_vol1issue1pp1-20.

Murf Studio Docs | Easy way to get started with Murf Studio (no date). Available at: https://murf.ai/docs/ (Accessed: 1 January 2024).

Muruganantham, G. (2015) 'Developing of E-content package by using ADDIE model', *International Journal of Applied Research*, 1(3), pp. 52–54. Available at: www.allresearchjournal.com.

Nguyen, N.T.T. (2021) 'A review of the effects of media on foreign language vocabulary acquisition', *International Journal of TESOL & Education*, 1(1), pp. 30–37. Available at: https://i-jte.org/index.php/journal/article/view/5.

Nomozova, M. & Ismoilova, M. (2022) 'Using authentic materials to improve listening skill', *So'ngi Ilmiy Tadqiqotlar Nazariyasi respublika ilmiy-uslubiy jurnali*, 5(2), pp. 52–56.

Nowrouzi, S., Tam, S.S., Zareian, G. & Nimehchisalem, V. (2015) 'Iranian EFL Students' Listening Comprehension Problems', *Theory and Practice in Language Studies*, 5(2), pp. 263–269. Available at: https://doi.org/http://dx.doi.org/10.17507/tpls.0502.05.

Nur Ekawati, Y., Meiristiani, N. & Eka Sulistyawati, A. (2018) 'Penerapan Model Pembelajaran Project-Based Learning pada Pengajaran Listening', *Cakrawala: Jurnal Pendidikan*, 12(2), pp. 159–170. Available at: https://doi.org/10.24905/cakrawala.v12i2.148.

Nurhas, I., Aditya, B.R., Jacob, D.W. & Pawlowski, J.M. (2021) 'Understanding the challenges of rapid digital transformation: the case of COVID-19 pandemic in higher education', *Behaviour and Information Technology*, 0(0), pp. 1–17. Available at: https://doi.org/10.1080/0144929X.2021.1962977.

Pardede, P. (2019) 'Print vs digital reading comprehension in EFL: A literature review', *JET (Journal of English Teaching)*, 5(2), p. 77. Available at: https://doi.org/10.33541/jet.v5i2.1062.

Parvin, R.H. & Salam, S.F. (2018) 'The effectiveness of using technology in English language classrooms in government primary schools in Bangladesh', *FIRE: Forum for International*

Research in Education, 2(1), pp. 47–59. Available at: https://doi.org/10.18275/fire201502011049.

Passakornkarn, S. & Vibulphol, J. (2020) 'Development of world Englishes-based listening materials to raise the awareness of the varieties of English for Thai EFL upper secondary school students', *LEARN Journal: Language Education and Acquisition Research Network*, 13(1), pp. 225–246.

Peters, E. (2018) 'The effect of out-of-class exposure to English language media on learners' vocabulary knowledge', *ITL - International Journal of Applied Linguistics*, 169(1), pp. 142–168. Available at: https://doi.org/10.1075/itl.00010.pet.

Al Qasim, N. & Al Fadda, H. (2013) 'From CALL to MALL: The effectiveness of podcast on EFL higher education students' listening comprehension', *English Language Teaching*, 6(9), pp. 30–41. Available at: https://doi.org/10.5539/elt.v6n9p30.

Quirk, R. (1990) 'Language varieties & standard language', *English Today*, 6(1), pp. 3–10. Available at: https://doi.org/10.1017/S0266078400004454.

Ran, D., Yingli, W. & Haoxin, Q. (2021) 'Artificial intelligence speech recognition model for correcting spoken English teaching', *Journal of Intelligent and Fuzzy Systems*, 40(2), pp. 3513–3524. Available at: https://doi.org/10.3233/JIFS-189388.

Renandya, W.A. & Farrell, T.S.C. (2011) '"Teacher, the tape is too fast!" Extensive listening in ELT', *ELT Journal*, 65(1), pp. 52–59. Available at: https://doi.org/10.1093/elt/ccq015.

Renukadevi, D. (2014) 'The role of listening in language acquisition; the challenges & strategies in teaching listening', *International Journal of Education and Information Studies*, 4(1), pp. 59–63. Available at: http://www.ripublication.com.

Richards, J.C. (2008) *Teaching Listening and Speaking: From theory to Practice*, *Cambridge University Press*. New York: Cambridge University Press.

Rochsun & Agustin, R.D. (2020) 'The development of e-module mathematics based on contextual problems', *European Journal of Education Studies*, 7(10), pp. 400–412. Available at: https://doi.org/10.46827/ejes.v7i10.3317.

Ruecker, T. & Ives, L. (2015) 'White Native English Speakers Needed: The Rhetorical Construction of Privilege in Online Teacher Recruitment Spaces', *TESOL Quarterly*, 49(4), pp. 733–756. Available at: https://doi.org/10.1002/tesq.195.

Shamsuddin, A., Ab Mubin, N.A., Mohd Zain, N.A., Mohd Akil, N.A. & Abdul Aziz, N.A. (2015) 'Perception of managers on the effectiveness of the internal audit functions: A case study in TNB', *South East Asia Journal of Contemporary Business, Economics and Law*, 7(1), pp. 30–39. Available at: http://seajbel.com/wp-content/uploads/2016/01/Acc-26.pdf.

Sugianto, D., Abdullah, A.G., Elvyanti, S. & Muladi, Y. (2017) 'Modul virtual: Multimedia Flipbook dasar teknik digital', *Innovation of Vocational Technology Education*, 9(2), pp. 101–116. Available at: https://doi.org/10.17509/invotec.v9i2.4860.

Suwatra, W., Suyatna, A. & Rosidin, U. (2018) 'Development of interactive e-module for global warming to grow of critical thinking skills', *International Journal of Advanced Engineering,*

Management and Science, 4(7), pp. 543–549. Available at: https://doi.org/10.22161/ijaems.4.7.7.

Trilestari, K. & Almunawaroh, N.F. (2021) 'E-module as a solution for young learners to study at home', in, pp. 364–369. Available at: https://doi.org/10.2991/assehr.k.201230.132.

Underwood, M. (1989) *Teaching Listening (LONGMAN HANDBOOKS FOR LANGUAGE TEACHERS)*. Addison-Wesley Longman Ltd.

Vandergrift, L. (2011) 'Handbook of Research in Second Language Teaching and Learning', in *Second Language Listening*. 1st Editio. Routledge, p. 17. Available at: https://doi.org/10.1017/cbo9780511667244.

Wartman, S.A. & Combs, C.D. (2018) 'Medical education must move from the information age to the age of artificial intelligence', *Academic Medicine*, 93(8), pp. 1107–1109. Available at: https://doi.org/10.1097/ACM.0000000000002044.

Wood, S.G., Moxley, J.H., Tighe, E.L. & Wagner, R.K. (2018) 'Does use of Text-to-Speech and related read-aloud tools improve reading comprehension for students with reading disabilities? A meta-analysis', *Journal of Learning Disabilities*, 51(1), pp. 73–84. Available at: https://doi.org/10.1177/0022219416688170.

Woottipong, K. (2014) 'Effect of using video materials in the teaching of listening skills for university students', *International Journal of Linguistics*, 6(4), p. 200. Available at: https://doi.org/10.5296/ijl.v6i4.5870.

Yulando, S., Sutopo & Franklin Chi, T. (2019) 'Electronic module design and development: An interactive learning', *American Journal of Educational Research*, 7(10), pp. 694–698. Available at: https://doi.org/10.12691/education-7-10-4.

Zein, S., Sukyadi, D., Hamied, F.A. & Lengkanawati, N.S. (2020) 'English language education in Indonesia: A review of research (2011-2019)', *Language Teaching*, 53(4), pp. 491–523. Available at: https://doi.org/10.1017/S0261444820000208.

Zhang, Q. (2021) 'A literature review of foreign studies on the impact of CALL on second language acquisition from 2015', *English Language Teaching*, 14(6), p. 76. Available at: https://doi.org/10.5539/elt.v14n6p76.

APPENDICES

Appendix 1:
The E-Module's Learning Objectives and Sections

Unit	Learning Objective and Listening Skill	Section
Unit 1	1. Identify the functions of greetings in social communication.Identify greeting expressions and their responses in English (intensive).	Pre-Activities While-Activities Practice 1 & Practice 2

	2. Identify expressions and responses of greetings in English monologues or conversations (selective). 3. Respond to English greeting expressions (responsive). 4. Determine explicit information in monologues and conversations consisting of greetings (extensive). 5. Determine implicit information in monologues and conversations consisting of greetings (extensive). 6. Compose a dialogue consisting of greeting expressions. 7. Expressions	Practice 4 Practice 3 Practice 5 Practice 6 Post-Activities
Unit 2	1. Identify the functions of leave-taking in social communication. 2. Identify leave-taking expressions and their responses in English (intensive). 3. Identify expressions and responses of leave-taking in English monologues or conversations (selective). 4. Respond to English leave-taking expressions (responsive). 5. Determine explicit information in monologues and conversations consisting of leave-takings (extensive). 6. Determine implicit information in monologues and conversations consisting of leave-takings (extensive). 7. Compose a dialogue consisting of leave-taking expressions.	Pre-Activities While-Activities Practice 1 & Practice 2 Practice 4 Practice 3 Practice 5 Practice 6 Post-Activities
Unit	1. Identify the functions of thanking and apologizing in social communication. 2. Identify thanking and apologizing expressions and their responses in English (intensive). 3. Identify expressions and responses of thanking and apologizing in English monologues or conversations (selective). 4. Respond to English thanking and apologizing expressions (responsive). 5. Determine explicit information in monologues and conversations consisting of thanking and apologizing (extensive). 6. Determine implicit information in monologues and conversations consisting of thanking and apologizing (extensive). 7. Compose a dialogue consisting of thanking and apologizing expressions.	Pre-Activities While-Activities Practice 1 & Practice 2 Practice 4 Practice 3 Practice 5 Practice 6 Post-Activities

https://doi.org/10.24167/celt.v24i2; ISSN: 1412-3320 (print); ISSN: 2502-4914 (online); Accredited; DOAJ

Appendix 2:
Validity and Reliability of Achievement Instruments

Question Number	Type of listening skills,	*r-count*	Validity	α	and reliability.
1	Responsive	0.373,	valid	0.660,	moderate.
2	Responsive	0.426,	valid	0.667,	moderate.
3	Responsive	0.338,	valid	0.670,	moderate.
4	Responsive	0.293,	valid	0.669,	moderate.
5	Responsive	0.519,	valid	0.637,	moderate.
6	Responsive	0.298,	valid	0.674,	moderate.
7	Responsive	0.390,	valid	0.658,	moderate.
8	Responsive	0.428,	valid	0.657,	moderate.
9	Responsive	0.310,	valid	0.674,	moderate.
10	Responsive	0.356,	valid	0.673,	moderate.
11	Responsive	0.445,	valid	0.654,	moderate.
12	Extensive	0.520,	valid	0.658,	moderate.
13	Extensive	0.430,	valid	0.660,	moderate.
14	Extensive	0.472,	valid	0.650,	moderate.
15	Extensive	0.465,	valid	0.657,	moderate.
16	Extensive	0.283,	valid	0.680,	moderate.
17	Extensive	0.269,	valid	0.673,	moderate.

Appendix 3:
Students' Evaluation Results

No	Statements	$\bar{X}$	Criteria
1	I prefer using the listening e-module over the materials provided in the textbook.	4.10	feasible
2	The listening e-module motivates me to listen more outside the classroom.	3.83	feasible
3	I prefer not to use simplified listening materials provided in the textbook.	3.70	feasible
4	The instructions in the e-module before the task helped me understand how to do the exercise.	4.00	feasible
5	The listening e-module helps me improve my language proficiency.	3.97	feasible
6	The listening e-module helps me understand native speakers' spoken expressions.	3.83	feasible
7	The listening e-module materials I listened to in the course were more interesting than the listening material in the textbook.	4.00	feasible
8	The listening e-module helps me understand other listening materials outside the class.	3.87	feasible
10	The listening e-module introduced me to how language is used in the real world.	4.00	feasible

11	I think the listening e-module will affect my learning.	3.37	fairly feasible
12	The listening e-module improves my language proficiency more than the materials from the textbook.	3.53	feasible
13	The listening e-module improves my listening comprehension ability more than the materials from the textbook.	3.73	feasible
14	The listening e-module helps develop my listening ability more than the materials from the textbook.	3.77	feasible
15	The listening e-module increases my familiarity with the use of grammar rules in their original context.	3.90	feasible
16	The listening e-module increases my vocabulary knowledge, which I need in real-life situations.	3.77	feasible
17	I am interested in learning English if the teacher uses the listening e-module as a teaching material.	3.80	feasible
	Average	3.85	feasible

https://doi.org/10.24167/celt.v24i2; ISSN: 1412-3320 (print); ISSN: 2502-4914 (online); Accredited; DOAJ