Assessing the Effectiveness of Text-to-Speech Applications on Enhancing Listening Comprehension and Student Engagement: A Quasi-Experimental Studys

*[1]Neneng Avrianti, [2]Yohanes Gatot Sutapa Yuliana, [3]Endang Susilawati,

[1,2,3]Tanjungpura University, Pontianak, Indonesia

*Corresponding Author

DOI: https://doi.org/10.47772/IJRISS.2025.925ILEIID000081

Received: 23 September 2025; Accepted: 30 September 2025; Published: 07 November 2025

ABSTRACT

This study investigates the effectiveness of Text-to-Speech (TTS) applications in enhancing listening comprehension and student engagement among Indonesian senior high school students learning English as a foreign language (EFL). Recognizing the persistent challenge of limited authentic audio materials and low learner motivation in EFL contexts, this quasi-experimental research employed a non-equivalent control group design involving 40 tenth-grade students divided into experimental and control groups. Over a three-week intervention, the experimental group utilized the TTSMaker application, while the control group received conventional instruction. Data were collected through pre- and post-tests for listening comprehension and time-on-task observations to assess engagement, analyzed using Multivariate Analysis of Covariance (MANCOVA) and Analysis of Covariance (ANCOVA). The results demonstrated substantial improvements in both listening comprehension (Partial Eta² = 0.937) and student engagement (Partial Eta² = 0.929), with the TTS intervention explaining 96.8% of the variance in post-test outcomes. These findings provide robust evidence that TTS technology effectively supports EFL learners by offering clear, consistent, and engaging auditory input that reduces cognitive load and promotes active participation. The study underscores the pedagogical potential of AI-based applications as accessible, cost-effective, and inclusive tools for improving English language instruction, particularly in resource-limited educational settings, and calls for further exploration of their long-term impacts and integration strategies in modern classrooms.

Keywords: Text-to-Speech; listening comprehension; student engagement; educational technology; AI in education

INTRODUCTION

In recent years, the integration of Artificial Intelligence (AI) in education has transformed traditional teaching methods, particularly in English as a Foreign Language (EFL) contexts. The growing use of digital tools has created new opportunities to enhance language learning effectiveness, learner engagement, and accessibility (Ahmadi, 2018; Masitho Istiqomah et al., 2021) and also to build the students' motivation (Woo & Choi, 2021). Engagement refers to the active and direct involvement of students in academic activities throughout the learning process. It can be seen as "energy in action," emphasizing its dynamic character and showing that genuine engagement extends beyond passive participation to include active involvement in behavioral, cognitive, and emotional aspects (Anderman et al., 2024; Cirocki et al., 2024). In educational contexts, Text-to-Speech (TTS) technology has shown significant value in supporting learning (Widyana et al., 2022). Among these innovations, Text-to-Speech (TTS) technology has emerged as a promising tool that converts written text into natural-sounding spoken language, allowing learners to develop listening comprehension through exposure to authentic pronunciation, intonation, and rhythm (Chen et al., 2021; Dida et al., 2023). TTS enhances listening skills (Karakaş, 2017; Manu & Masan, 2020; Matsuda, 2017) and promote good engagement (Al-Jarf, 2022; Amin, 2024; Chiang, 2019; Huang & Liao, 2024). In highlighted, it can improve language skills like reading fluency, vocabulary, decoding, and pronunciation accuracy, as well as enhance listening and comprehension of oral

instructions. Recent studies show that the software's support for various accents helps students understand information better, while their positive attitudes toward TTS promote flexible learning anytime and anywhere. In Indonesia, teaching listening comprehension remains a persistent challenge due to the limited availability of native-like audio materials, the high cost of commercial resources, and low learner motivation (Fitria, 2022; Yudhistiro & Silalahi, 2021). Traditional instruction often relies on outdated recordings or teacher narration, which may not reflect real-world speech patterns or provide sufficient linguistic variety (Sherina & Hasnawati, 2023). As a result, students struggle to comprehend authentic spoken English, limiting their overall language proficiency.

Problem Statement

Despite the increasing availability of AI-based educational technologies, there remains a significant gap in empirical research examining the effectiveness of Text-to-Speech (TTS) applications for improving both listening comprehension and student engagement among Indonesian EFL learners. Most prior studies have focused on pronunciation or reading assistance (Manu & Masan, 2020; Widyana et al., 2022), leaving unclear whether TTS can meaningfully enhance comprehension and participation in authentic listening contexts. This gap highlights the urgent need to explore TTS as an innovative, low-cost, and pedagogically sound alternative to conventional listening instruction. Given these challenges, integrating AI-based TTS applications into English instruction presents an innovative, cost-effective, and inclusive alternative. This research specifically explores the effectiveness of the TTSMaker application in enhancing listening comprehension and promoting student engagement among senior high school learners in Indonesia. The issue is significant because listening ability forms the foundation for other language skills, and engagement determines long-term language success (Brown & Lee, 2015; Wang et al., 2024).

Objectives

This study aimed to investigate the pedagogical impact of using Text-to-Speech (TTS) applications in English language learning for Indonesian EFL students. The specific objectives were to:

1. Evaluate whether the use of the TTSMaker application significantly improves students' listening comprehension compared with conventional teaching methods.
2. Determine the extent to which TTS technology enhances student engagement during listening activities.
3. Assess the overall effectiveness of TTS applications as an accessible educational innovation for resource-limited learning environments.

These objectives were directly aligned with the problem of inadequate listening instruction in Indonesian classrooms and aimed to provide empirical evidence supporting the use of AI-driven learning tools for sustainable English education.

PRODUCT DESCRIPTION & METHODOLOGY

The innovation in this study centers on the Text-to-Speech application, particularly the TTSMaker application, a free, web-based Text-to-Speech platform that converts English text into natural audio using AI-generated voices. The software allows teachers to create customizable listening materials that mirror native pronunciation, adjust speech speed, and accommodate different learner proficiency levels. Unlike conventional listening activities that rely on static recordings or textbook CDs, TTSMaker offers dynamic, updatable, and authentic audio content that is accessible anytime and anywhere. Appendix 2.

To evaluate its educational effectiveness, the study employed a quasi-experimental non-equivalent control group. The participants consisted of 52 tenth-grade students from two existing classes. This study used an intact group design; each group consisted of 26 students were divided into an experimental group (using TTSMaker) and a control group (receiving conventional instruction). The planned sample size was 26 students in each group. However, due to the absence of some students during the treatment, the actual sample analyzed consisted of 20 students. The analysis was conducted only with students who fully participated in the treatment/test. This condition is referred to as attrition or subject loss in the study. The intervention lasted three weeks (see Appendix

3), focusing on listening comprehension lessons aligned with the national English curriculum. Listening comprehension was measured using a pre-validated pre- and post-test, with ten multiple-choice, ten true and false statements, and one inferential question (see Appendix 4).

While student engagement was assessed through Time-on-Task observation employing a 2-minute momentary time sampling technique that was conducted over 30 minutes pre- and post-test (Fisher et al., 2015; Spanjers et al., 2008), see Appendix 5. Especially in ToT observation, based on Fisher et al. (2014), divide "time-on-task" into two categories: on-task and off-task. On-task behavior involves active participation in learning activities like reading, writing, listening, discussing, or presenting. Off-task behavior includes actions unrelated to the lesson, classified into four types: irrelevant peer interactions, attention to the environment, self-directed actions, and other behaviors such as wandering or sleeping (Godwin et al., 2021). A pilot study was conducted to ensure the reliability and validity of the instruments, so that we could test the effectiveness of data collection methods and make adjustments before using them with actual participants (Cohen et al., 2018; Mackey & Gass, 2016). Data collection proceeded in three stages: pre-testing, treatment implementation (integration of Text-to-Speech applications for the experimental group), and post-testing. Both control and experimental groups must receive identical initial assessments and identical post-tests, though the initial evaluation may differ in form from the post-test as long as they assess the same content at the same difficulty level. When developing these tests, it's crucial to ensure that neither group has an unfair advantage in completing the post-test, while maintaining consistent content coverage and difficulty across both assessments (Cohen et al., 2018). The topics for pre-, post-test, and treatment were similar; it was about sport and athletes (see Appendices). Before data collection, ethical clearance and school permission were obtained. Statistical analyses included descriptive statistics, assumption testing (using the Shapiro–Wilk test for normality and Levene's test for homogeneity), and inferential analysis. To address the first research question, Multivariate Analysis of Covariance (MANCOVA) was employed to compare posttest outcomes between the experimental and control groups while controlling for pretest scores. To address the second research question, Analysis of Covariance (ANCOVA) was applied within the experimental group to examine posttest scores while controlling for corresponding pretest scores. A significance level of $p < 0.05$ was used throughout.

POTENTIAL FINDINGS AND COMMERCIALIZATION

This section presents the results of a quasi-experimental study investigating the effect of Text-to-Speech (TTS) applications on students' listening comprehension and engagement. Data analysis followed a systematic process, including assumption testing, descriptive statistics, and inferential analysis. Based on the results of the descriptive analysis in Table 1, the experimental group's mean pre-listening score was 59.70 (SD = 1.92, 95% CI [58.80, 60.60]), while the control group obtained a mean score of 60.05 (SD = 1.47, 95% CI [59.36, 60.74]). After the treatment, the experimental group's mean post-listening score increased to 77.20 (SD = 2.57), which was considerably higher than that of the control group, which reached only 62.20 (SD = 2.46). A similar trend was observed in engagement scores, where the experimental group showed an improvement from 60.00 to 82.85, while the control group increased slightly from 59.55 to 60.75.

Table 1. Statistics Descriptive.

Variable	Group	Mean	SD	95% CI (Lower–Upper)
Pre-Listening	Experiment	59.70	1.92	58.80–60.60
	Control	60.05	1.47	59.36–60.74
Post Listening	Experiment	77.20	2.57	76.00–78.40
	Control	62.20	2.46	61.05–63.35
Pre Engagement	Experiment	60.00	2.41	58.87–61.13
	Control	59.55	3.28	58.01–61.09
Post Engagement	Experiment	82.85	3.83	81.06–84.64
	Control	60.75	3.85	58.95–62.55

In Table 2, the Shapiro-Wilk test confirmed normal data distribution ($p > 0.05$), and Levene's test confirmed the assumption of homogeneity of variances for all variables ($p > .05$), indicating equal variances between groups. Independent Samples T-Test results revealed no significant differences between the experimental and control groups on the **Pre-Listening Score** ($t(38) = -0.647$, $p = .521$) and **Pre-Engagement Score** ($t(38) = 0.494$, $p = .624$), confirming that both groups were equivalent before the treatment. However, the **Post-Listening Score** ($t(38) = 18.859$, $p < .001$) and **Post-Engagement Score** ($t(38) = 18.200$, $p < .001$) showed highly significant differences in favor of the experimental group. These results indicate that the implementation of **Text-to-Speech (TTS) applications** had a substantial positive effect on students' listening comprehension and engagement levels. See Appendix 1.

Table 2. Normality Test

	Group	Shapiro-Wilk		
		Statistic	df	Sig.
Pre Listening Score	Experiment	.966	20	.679
	Control	.957	20	.489
Post Listening Score	Experiment	.970	20	.748
	Control	.968	20	.714
Pre Engagement Score	Experiment	.934	20	.181
	Control	.932	20	.169
Post Engagement Score	Experiment	.972	20	.793
	Control	.973	20	.821
*. This is a lower bound of the true significance.				
a. Lilliefors Significance Correction				

The results demonstrated that the integration of TTSMaker significantly improved students' listening comprehension and engagement levels compared with conventional instruction. The MANCOVA analysis revealed highly significant between-group differences ($p < 0.001$) with very large effect sizes: listening comprehension (Partial $Eta^2 = 0.937$) in Table 3 and engagement (Partial $Eta^2 = 0.929$) in Table 4. The intervention in Table 5 explained 96.8% of the variance in combined post-test outcomes, confirming the robust impact of TTS-based learning.

Table 3. The Between-Subjects Analysis of Post-test Listening Comprehension

Factor	Significance	Partial Eta^2	Effect Size
Pre-test Listening	0.000	0.351	Large
Pre-test Engagement	0.000	0.326	Large
Group	**0.000**	**0.937**	**Very Large**

Table 4. The Between-Subjects Analysis of Post-Test Engagement

Factor	Significance	Partial Eta^2	Effect Size
Pre-test Listening	0.434	0.017	Not significant
Pre-test Engagement	0.374	0.022	Not significant
Group	**0.000**	**0.929**	**Very Large**

Table 5. A Multivariate Analysis of Covariance (MANCOVA)

Effect	Significance	Partial Eta Squared	Interpretation
Pre-test Listening	0.000	-	Significant covariate effect
Pre-test Engagement	0.001	-	Significant covariate effect
Group	**0.000**	**0.968**	**Very large treatment effect**

Within-group analyses also indicated substantial improvement in listening comprehension ($p = 0.002$; Partial $Eta^2 = 0.412$) in Table 6 and engagement ($p = 0.028$; Partial $Eta^2 = 0.241$) in Table 7,

Table 6. The Within-Group Analysis of Post-Test Engagement

Tests of Between-Subjects Effects

Dependent Variable: Post Listening Score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	51.625[a]	1	51.625	12.630	.002	.412
Intercept	13.306	1	13.306	3.255	.088	.153
Prelisten	51.625	1	51.625	12.630	.002	.412
Error	73.575	18	4.088			
Total	119322.000	20				
Corrected Total	125.200	19				

a. R Squared = .412 (Adjusted R Squared = .380)

Table 7. The Within-Group Analysis of Post-Test Engagement

Tests of Between-Subjects Effects

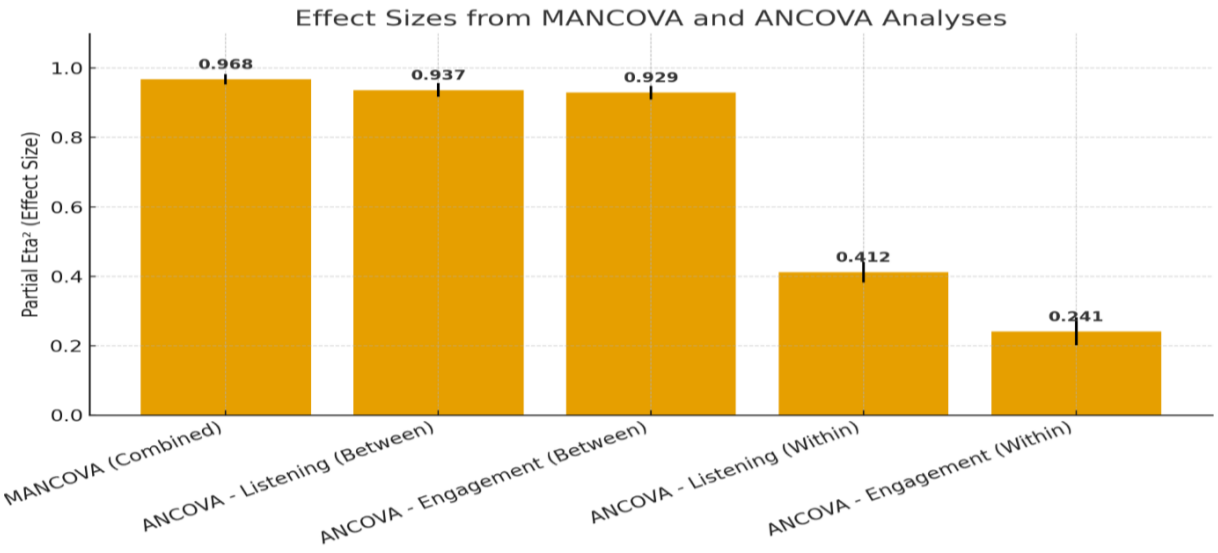
Dependent Variable: Post Engagement Score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	67.236[a]	1	67.236	5.727	.028	.241
Intercept	39.410	1	39.410	3.357	.084	.157
Preengage	67.236	1	67.236	5.727	.028	.241
Error	211.314	18	11.740			
Total	137561.000	20				
Corrected Total	278.550	19				

a. R Squared = .241 (Adjusted R Squared = .199)

This study provides robust empirical evidence for the effectiveness of Text-to-Speech applications in enhancing listening comprehension and student engagement among Indonesian senior high school students learning English as a foreign language. The exceptionally large effect sizes observed across all analyses demonstrate that TTS technology represents a powerful educational tool with significant potential for transforming English language instruction. The findings address both research questions conclusively. First, the use of TTS applications significantly and substantially affects students' listening comprehension skills and engagement compared to traditional methods, with effect sizes that exceed typical educational interventions. Second, within the experimental group, significant improvements in both listening comprehension and engagement were observed following the TTS intervention, confirming the technology's direct positive impact. Based on the time-on-task observations, students in the experimental group using the TTSMaker application showed noticeably higher engagement throughout the learning sessions. They remained focused on assigned tasks, actively listened, and interacted meaningfully with the material. Instances of off-task behavior were minimal, indicating that TTS use sustained students' attention and encouraged consistent participation in learning activities.

Figure 1. MANCOVA and ANCOVA Analyses



Besides that, the students were asked to give their perspective on using Text-to-Speech (TTS) applications that made learning English more enjoyable and less stressful. They felt that listening to clear, natural-sounding voices helped them understand pronunciation and meaning more easily than with the technique that is usually used by the teacher or traditional listening materials. Many students mentioned that the TTS activities increased their motivation to practice listening outside the classroom and made lessons feel more interactive. Some also appreciated that they could replay the audio anytime, which helped them learn at their own pace. Overall, learners perceived TTS as a useful and modern tool that improved both their comprehension and confidence in learning English.

From a practical perspective, these results suggest that TTS applications like TTSMaker offer a viable and highly effective solution to the persistent challenges faced by English language educators in Indonesia. The technology's accessibility, cost-effectiveness, and ease of implementation make it particularly suitable for resource-limited educational contexts. The ability to create customized, high-quality audio materials addresses the specific needs of Indonesian EFL learners while providing the flexibility to adapt to rapidly evolving curriculum requirements. The theoretical implications of this study extend beyond the immediate context, providing empirical support for the integration of AI-powered educational technologies within established pedagogical frameworks. The results demonstrate that when properly implemented, TTS technology can enhance rather than replace traditional instruction, creating synergistic effects that benefit both academic outcomes and student motivation. However, successful implementation of TTS technology requires careful consideration of contextual factors, teacher training, and ongoing support. Educational institutions and policymakers should view these findings as an opportunity to invest in digital infrastructure and professional development that enables educators to effectively integrate such technologies into their teaching practices.

The implications of this research extend beyond the Indonesian context, offering insights relevant to EFL instruction globally, particularly in developing countries facing similar resource constraints and technological integration challenges. The study contributes to the growing body of evidence supporting the transformative potential of AI-powered educational technologies while providing a model for rigorous evaluation of such interventions. As we move further into the digital age, the integration of technologies like TTS applications represents not merely an enhancement to traditional teaching methods but a necessary evolution in educational practice. The exceptional results observed in this study suggest that embracing such innovations can lead to substantial improvements in both learning outcomes and student engagement, ultimately contributing to more effective and inclusive English language education. The success demonstrated in this research should encourage

educators, administrators, and policymakers to seriously consider TTS technology integration as part of comprehensive strategies for improving English language instruction. With proper implementation, support, and continued research, TTS applications have the potential to significantly enhance the quality and accessibility of English language education, thereby preparing students more effectively for success in our increasingly interconnected and digitally driven world.

NOVELTY AND RECOMMENDATIONS

This research contributes novelty in two key areas. First, it provides empirical evidence on the pedagogical benefits of TTS applications in improving listening comprehension and engagement within an Indonesian EFL context, an area where prior studies were mostly theoretical or limited to small-scale pilot implementations (Manu & Masan, 2020; Widyana et al., 2022). Second, it demonstrates how AI-powered TTS technology can serve as a sustainable alternative to traditional listening materials, enabling teachers to create authentic, adaptive, and cost-free audio resources that cater to diverse learner needs. The study validates Cognitive Load Theory (Sweller, 1988) by showing that TTS reduces learners' mental effort during listening, allowing more focus on comprehension. It also aligns with Social Constructivist Theory (Vygotsky), emphasizing that engaging in technological tools fosters interactive and collaborative learning experiences.

Future research should examine the long-term effects of TTS integration on language retention, explore learner and teacher perceptions qualitatively, and compare various TTS platforms to determine the most effective features for classroom application. Additionally, government and institutional stakeholders are encouraged to support digital literacy programs and professional development initiatives to facilitate the widespread and pedagogically sound adoption of AI-driven educational tools.

ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude to the Department of English Education, Faculty of Teacher Training and Education, Tanjungpura University, for the continuous academic and administrative support provided throughout this research. Special appreciation is extended to the participating students and English teachers at the senior high school in Sui Kunyit, whose cooperation made this study possible. The authors are also thankful to their colleagues for their constructive feedback and valuable insights during the research process. This study was conducted independently as part of the authors' commitment to advancing English language education and technology-enhanced learning in Indonesia.

REFERENCES

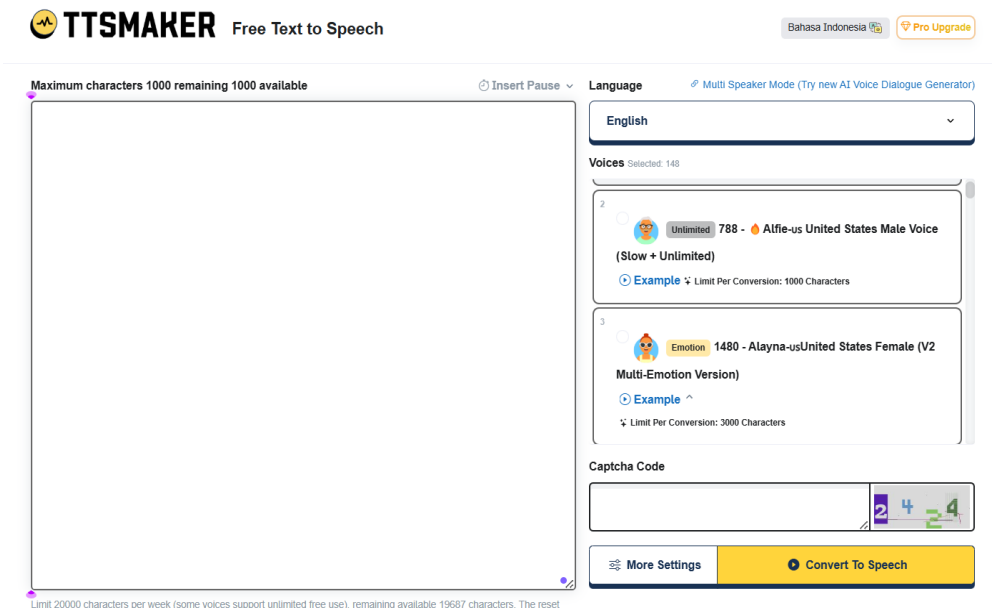
1. Ahmadi, M. R. (2018). The Use of Technology in English Language Learning: A Literature Review. International Journal of Research in English Education, 3(2), 115–125. https://doi.org/10.29252/ijree.3.2.115
2. Al-Jarf, R. (2022). Text-To-Speech Software for Promoting EFL Freshman Students' Decoding Skills and Pronunciation Accuracy. Journal of Computer Science and Technology Studies, 4(2), 19–30. https://doi.org/10.32996/jcsts
3. Amin, E. A.-R. (2024). EFL Students' Perception of Using AI Text-to-Speech Apps in Learning Pronunciation. Migration Letters, 21(3), 887–903. www.migrationletters.com
4. Anderman, E. M., Anderman, L. H., & Ormrod, J. E. (2024). Educational psychology: Developing Learners. In Pearson Education (8th Ed.). Pearson Education.
5. Brown, H. D., & Lee, H. (2015). Teaching by Principles: An Interactive Approach to Language Pedagogy. In Pearson Education (4th Ed.). Pearson Education.
6. Chen, M., Tan, X., Li, B., Liu, Y., Qin, T., Zhao, S., & Liu, T.-Y. (2021). AdaSpeech: Adaptive Text to Speech for Custom Voice. ICLR, 1–10. http://arxiv.org/abs/2103.00993
7. Chiang, H.-H. (2019). A Comparison Between Teacher-Led and Online Text-to-Speech Dictation for Students' Vocabulary Performance. English Language Teaching, 12(3), 77. https://doi.org/10.5539/elt.v12n3p77
8. Cirocki, A., Indrarathne, B., & Mcculloch, S. (2024). Cognitive and Educational Psychology for TESOL A Guide for Practitioners. Springer. https://doi.org/10.1007/978-3-031-66532-5

9. Cohen, L., Manion, L., & Morrison, K. (2018). Research Methods in Education. In Routledge (8th Ed.). Routledge.
10. Dida, H. A., Chakravarthy, D., & Rabbi, F. (2023). ChatGPT and Big Data: Enhancing Text-to-Speech Conversion. Mesopotamian Journal of Big Data, 2023, 31–35. https://doi.org/10.58496/mjbd/2023/005
11. Fisher, C., Berliner, D., Filby, N., Marliave, R., Cahen, L., & Dishaw, M. (2015). Teaching behaviors, academic learning time, and student achievement: An overview. Journal of Classroom Interaction, 50(1), 6–24. https://files.eric.ed.gov/fulltext/EJ1100414.pdf
12. Fitria, T. N. (2022). Utilizing Text-to-Speech Technology: Natural Reader in Teaching Pronunciation. JETLEE : Journal of English Language Teaching, Linguistics, and Literature, 2(2), 70–78. https://doi.org/10.47766/jetlee.v2i2.312
13. Godwin, K. E., Seltman, H., Almeda, M., Davis Skerbetz, M., Kai, S., Baker, R. S., & Fisher, A. V. (2021). The Elusive Relationship Between Time on-Task and Learning: Not Simply an Issue of Measurement. Educational Psychology, 41(4), 502–519. https://doi.org/10.1080/01443410.2021.1894324
14. Huang, Y.-C., & Liao, L.-C. (2024). A Study of Text-to-Speech (TTS) In Children's English Learning. Teaching English with Technology, 15(1), 14–30. https://www.ceeol.com/search/article-detail?id=166912http://www.tewtjournal.org
15. Karakaş, A. (2017). English voices in 'Text-to-speech tools': representation of English users and their varieties from a World Englishes perspective. Advances in Language and Literary Studies, 8(5), 108. https://doi.org/10.7575/aiac.alls.v.8n.5p.108
16. Mackey, A., & Gass, S. M. (2016). Second Language Research: Methodology and Design. In Second Language Research: Methodology and Design, Second Edition (2nd Ed.). Routledge. https://doi.org/10.4324/9781315750606
17. Manu, G. A., & Masan, P. L. (2020). Aplikasi Text-to-Speech Untuk Meningkatkan Pembelajaran Bahasa Inggris Bagi Siswa Disabilitas. Jurnal Pendidikan Teknologi Informasi (JUKANTI), 3(2), 17–26.
18. Masitho Istiqomah, D., Aisyah, R. N., & Ahsana El-Sulukiyyah, A. (2021). Developing E-learning Module by Using Text-To-Speech (TTS) in Telegram Bot for Listening Comprehension. Advances in Social Science, Education and Humanities Research, 626, 38–43. http://www.swiftelearningservices.com/blended-
19. Matsuda, N. (2017). Evidence of Effects of Text-to-Speech Synthetic Speech to Improve Second Language Learning. JACET Journal, 61, 149–164.
20. Sherina, & Hasnawati. (2023). Pemanfaatan Text to Speech Pada Aplikasi E-Learning Sebagai Media Pembelajaran Interaktif Bahasa Inggris Berbasis Mobile. JURNAL SINTAKS LOGIKA, 3(1), 43–51. https://jurnal.umpar.ac.id/index.php/sylog
21. Spanjers, D. M., Burns, M. K., & Wagner, A. R. (2008). Systematic Direct Observation of Time on Task as a Measure of Student Engagement. Assessment for Effective Intervention, 33(2), 120–126. https://doi.org/10.1177/1534508407311407
22. Wang, Y., Xin, Y., & Chen, L. (2024). Navigating the Emotional Landscape: Insights Into Resilience, Engagement, and Burnout Among Chinese High School English As A Foreign Language Learners. Learning and Motivation, 86(February). https://doi.org/10.1016/j.lmot.2024.101978
23. Widyana, A., Jerusalem, M. I., & Yumechas, B. (2022). The Application of Text-to-Speech Technology in Language Learning. Proceedings of the Sixth International Conference on Language, Literature, Culture, and Education (ICOLLITE 2022), 85–92. https://doi.org/10.2991/978-2-494069-91-6_14
24. Woo, J. H., & Choi, H. (2021). Systematic Review for AI-based Language Learning Tools. Journal of Digital Contents Society, 22(11), 1783–1792. https://doi.org/10.9728/dcs.2021.22.11.1783
25. Yudhistiro, K., & Silalahi, E. B. (2021). Peningkatan Kemampuan Pronunciation Vocabulary Untuk Pembelajaran Bahasa Inggris Dengan Teknologi Text-To-Speech Dan Speech Recognition Di Sekolah Dasar YBPK Malang. JMM - Jurnal Masyarakat Merdeka, 4(1), 13–17.

APPENDIX 2

Independent Samples 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
Pre-Listening Score	Equal variances assumed	1.390	.246	-.647	38	.521	-.350	.541	-1.445	.745
	Equal variances not assumed			-.647	35.539	.522	-.350	.541	-1.447	.747
Post Listening Score	Equal variances assumed	.028	.868	18.859	38	.000	15.000	.795	13.390	16.610
	Equal variances not assumed			18.859	37.934	.000	15.000	.795	13.390	16.610
Pre Engagement Score	Equal variances assumed	2.131	.153	.494	38	.624	.450	.910	-1.393	2.293
	Equal variances not assumed			.494	34.834	.624	.450	.910	-1.399	2.299
Post Engagement Score	Equal variances assumed	.022	.884	18.200	38	.000	22.100	1.214	19.642	24.558
	Equal variances not assumed			18.200	37.999	.000	22.100	1.214	19.642	24.558

TTS Maker Application



TTSMaker Configuration Parameters

Parameter	Description	Setting Used
Voice Type	Speaker gender	Female
Language	Voice language	English US
Speed	Speech rate	0.85x (slightly slower)
Pitch	Voice tone	Neutral
Output Format	Audio file type	MP3

APPENDIX 3

INTERVENTION PLAN (3 MEETINGS)

Descriptive Text (Monologue & Conversation)

General Theme: Great Athletes

Meeting 1

Monologue: Lionel Messi (Soccer)

Focus: Identifying main ideas and details

Pre-Listening

- The teacher shows a photo of Messi.
- Q&A: "What do you know about Lionel Messi?"
- Vocabulary brainstorming: goal, champion, World Cup, Barcelona, Argentina.

While-Listening

Audio (TTS Monologue about Messi):
"Lionel Messi is one of the most famous football players in the world. He was born in Argentina in 1987. Messi is known for his dribbling skills, creativity, and teamwork. He played for Barcelona for more than 15 years and scored over 600 goals. In 2022, he helped Argentina win the FIFA World Cup. Messi is admired for his humility and dedication."

Task 1 (Main Idea): Students choose the main idea, "Messi's achievements and qualities as a football player."

Task 2 (Details): Students answer multiple choice questions about his birth year, country, number of goals, and latest achievement.

1. When was Lionel Messi born?
A. In 1985
B. In 1986
C. In 1987
D. In 1988
E. In 1989

2. Where was Lionel Messi born?
A. Brazil

B. Spain
C. Portugal
D. Argentina
E. France

3. How many goals did Messi score for Barcelona?
A. Over 400 goals
B. Over 500 goals
C. Over 600 goals
D. Over 700 goals
E. Over 800 goals

4. What was Messi's latest achievement mentioned in the text?
A. Winning the UEFA Champions League
B. Becoming Barcelona's captain
C. Winning the FIFA World Cup
D. Moving to Paris Saint-Germain
E. Retiring from football

5. What is the main idea of the text?
A. Lionel Messi's journey to becoming a football coach
B. Lionel Messi's early life and education
C. Lionel Messi's achievements and qualities as a football player
D. Lionel Messi's problems during his career
E. Lionel Messi's life after retirement

Post-Listening

- Short discussion: "What qualities of Messi can inspire students?"
- Students write three adjectives to describe Messi (example: talented, humble, hardworking).

Meeting 2

Conversation: LeBron James (Basketball)

Focus: Inference (implied meaning)

Pre-Listening

- The teacher shows a picture of LeBron James.
- Questions: "Do you know LeBron James? What sport does he play?"
- Prediction activity: "What achievements might the speakers talk about?"

While-Listening
Audio (TTS Conversation about LeBron):
A: "Have you heard about LeBron James?"
B: "Of course, he is one of the greatest basketball players ever."
A: "What makes him so famous?"
B: "He has won NBA championships, played in many All-Star games, and is known as a leader on and off the court."
A: "Wow, so he inspires people not only by his skills, but also by his personality."
B: "Exactly, he is also very active in charity and education projects."

Task 1 (Inference – True/False):

- LeBron is respected only for his basketball skills. (F)
- His influence outside the court makes him a role model. (T)
- LeBron James is known as one of the greatest basketball players ever. (T)
- He has never played in any All-Star games. (F)
- The conversation shows that LeBron inspires people both by his talent and his character. (T)

Task 2 (Pair Discussion): Students discuss: "What values does LeBron promote beyond sports?"

Post-Listening

- Students create a short conversation about another athlete (example: badminton player).
- Role-play: one student asks, the other answers.

Meeting 3

Mixed: Novak Djokovic (Tennis) & Michael Phelps (Swimming)

Focus: Evaluating content and communicative purpose

1. Pre-Listening

- The teacher shows photos of Djokovic and Phelps.
- Questions: "Which sports do they play? What do you know about them?"

2. While-Listening
Audio 1 (Djokovic Monologue):
"Novak Djokovic is a Serbian tennis player. He has won more than 20 Grand Slam titles and is known for his strong mental focus. Djokovic is also famous for his fitness and consistent performance. He often speaks about discipline and resilience in sports."

Audio 2 (Phelps Conversation):
A: "Michael Phelps is amazing, right?"
B: "Yes, he is the most decorated Olympian of all time with 23 gold medals in swimming."
A: "Unbelievable! What makes him so successful?"
B: "Hard work, daily practice, and determination."

Task 1 (Evaluation – True/False):

- The text about Djokovic aims to describe his hobbies. (F)
- The conversation about Phelps expresses admiration for his discipline. (T)
- Both texts emphasize the importance of mental and physical preparation. (T)
- Novak Djokovic comes from Serbia. (T)

- Djokovic is known for being lazy and inconsistent in his performance. (T)
- He often talks about discipline and resilience in sports. (T)
- Michael Phelps has won 23 gold medals in swimming. (T)
- Phelps is described as an ordinary swimmer with few achievements. (F)
- According to the conversation, Phelps's success comes from hard work and daily practice. (T)
- Both athletes are known only for their natural talent, not for their discipline or effort. (F)

3. Post-Listening
• Small group discussion: "Which athlete inspires you the most and why?"
• 2–3 minute presentation – students present their discussion results.

APPENDIX 4

Instrument: Listening Comprehension Pre-Test

AUDIO TEXT: Cristiano Ronaldo

"Cristiano Ronaldo is one of the most famous football players in the world. He was born in Madeira, Portugal, in 1985. Ronaldo is known for his speed, strong shots, and amazing goals. He has played for big clubs like Manchester United, Real Madrid, and Juventus. With these teams, he won many trophies, including league titles and the Champions League. Ronaldo also played for the Portugal national team and helped them win the European Championship in 2016. Many people admire him for his discipline and hard work, both on and off the field."

Multiple Choice

Listen carefully to the audio. You will hear some questions followed by four possible answers. Choose the correct answer based on what you hear for numbers 1-5.

1. What is the main idea of the monologue about Cristiano Ronaldo?
   A. His personal life
   B. His career in different clubs
   C. His reputation as a great football player
   D. His family background
   E. His retirement plan

2. What does the speaker mainly describe about Ronaldo?
   A. His trophies only
   B. His personality only
   C. His birthplace only
   D. His overall achievements and qualities
   E. His future plans

3. Where was Cristiano Ronaldo born?
   A. Madrid
   B. Manchester
   C. Madeira

D. Lisbon
E. Turin

4. In what year was Cristiano Ronaldo born?
   A. 1982
   B. 1983
   C. 1984
   D. 1985
   E. 1986

5. Which team did Ronaldo help win the European Championship?
   A. Real Madrid
   B. Juventus
   C. Portugal national team
   D. Manchester United
   E. Sporting Lisbon

True/False

After listening, decide whether each statement is true or false based on the information in the recording for numbers 6-10.

No.	Statement	True	False
6.	Ronaldo became successful only because of his natural talent. (T/F)		
7.	Ronaldo never played for the Portugal national team. (T/F)		
8.	Ronaldo is admired for his dedication. (T/F)		
9.	The purpose of the monologue about Ronaldo is to entertain the audience with a funny story. (T/F)		
10.	The text encourages listeners to learn discipline and hard work from an athlete. (T/F)		

AUDIO TEXT: Michael Jordan

A: “Hey, do you know about Michael Jordan?”
B: “Of course! He is considered the greatest basketball player of all time.”
A: “What made him so special?”
B: “He played for the Chicago Bulls and won six NBA championships. His skills, leadership, and competitive spirit made him different from others.”
A: “Wow, did he only play basketball?”
B: “No, he also tried baseball for a short time, but basketball was always his passion. Even after retiring, he inspired millions of athletes around the world.”

Multiple Choice

Listen carefully to the audio. You will hear some questions followed by four possible answers. Choose the correct answer based on what you hear for numbers 11-15.

11. What is the main topic of the conversation?
    A. Michael Jordan's family life
    B. Michael Jordan's career in basketball
    C. Michael Jordan's short baseball career
    D. Michael Jordan's early childhood
    E. Michael Jordan's coaching experience

12. What is the conversation mainly discussing about Jordan?
    A. His failures in sports
    B. His hobbies outside basketball
    C. His role as a coach
    D. His greatness as a basketball player
    E. His retirement life

13. What makes these two athletes similar according to the texts?
    A. Both played tennis
    B. Both retired in 2016
    C. Both are admired for their achievements and influence
    D. Both were born in Portugal
    E. Both never played in international competitions

14. How many NBA championships did Michael Jordan win with the Chicago Bulls?
    A. Four
    B. Five
    C. Six
    D. Seven
    E. Eight

15. What other sport did Michael Jordan try?
    A. Tennis
    B. Golf
    C. Baseball
    D. Soccer
    E. Swimming

True/False

After listening, decide whether each statement is true or false based on the information in the recording for numbers 16-20.

No.	Statement	True	False
16.	Jordan's influence on athletes continues even after his retirement. (T/F)		
17.	Jordan's baseball career was longer than his basketball career. (T/F)		
18.	The conversation about Jordan aims to describe why he is considered the greatest. (T/F)		
19.	The text highlights the personal hobbies of the athlete more than their achievements. (T/F)		
20.	The speakers show respect and admiration for Jordan. (T/F)		

21. What can you infer about the qualities that make great athletes like Michael Jordan and Ronaldo successful?

Instrument: Listening Comprehension Post-Test

AUDIO TEXT: Serena Williams

"Serena Williams is one of the greatest tennis players of all time. She was born in Michigan, United States, in 1981. Serena is famous for her powerful serve, strong groundstrokes, and fighting spirit. She won 23 Grand Slam singles titles, the most in the Open Era. Serena also won Olympic gold medals and became a role model for many young athletes. In 2022, she retired from professional tennis, but her legacy continues to inspire people around the world."

Multiple Choice

Listen carefully to the audio. You will hear some questions followed by four possible answers. Choose the correct answer based on what you hear for numbers 1-5.

1. What is the main idea of the monologue about Serena Williams?
   A. Her personal hobbies
   B. Her powerful tennis skills and achievements
   C. Her childhood memories
   D. Her favorite tournaments
   E. Her life after retirement

2. What does the speaker mainly describe about Serena Williams?
   A. Her injuries during matches
   B. Her career as a coach
   C. Her Grand Slam victories and influence
   D. Her life in Michigan
   E. Her retirement hobbies

3. Where was Serena Williams born?
   A. New York
   B. Los Angeles
   C. Michigan
   D. Florida
   E. Texas

4. In what year was Serena Williams born?
   A. 1979
   B. 1980
   C. 1981
   D. 1982
   E. 1983

5. How many Grand Slam singles titles did Serena Williams win?
   A. 21
   B. 22
   C. 23
   D. 24
   E. 25

True/False

After listening, decide whether each statement is true or false based on the information in the recording for numbers 6-10.

No.	Statement	True	False
6.	Serena Williams is admired only for her physical strength. (T/F)		
7.	Serena Williams' retirement means she is no longer an inspiration. (T/F)		
8.	The purpose of the monologue about Serena is to describe her life as a coach. (T/F)		
9.	The text focuses more on the personal hobby of the athlete than his career. (T/F)		
10.	The tone of the text shows admiration for the athlete's achievements. (T/F)		

AUDIO TEXT: Usain Bolt

A: "Have you ever heard of Usain Bolt?"
B: "Yes, he is the fastest sprinter in history."
A: "What did he achieve?"
B: "He won eight Olympic gold medals and set world records in the 100 meters and 200 meters."
A: "That's incredible! Did he retire already?"
B: "Yes, he retired in 2017, but people still call him the 'Lightning Bolt' because of his amazing speed."

Multiple Choice

Listen carefully to the audio. You will hear some questions followed by four possible answers. Choose the correct answer based on what you hear for numbers 11-15.

11. What is the main topic of the conversation?
    A. Usain Bolt's life in Jamaica
    B. Usain Bolt's records and achievements in sprinting
    C. Usain Bolt's family background
    D. Usain Bolt's coaching career
    E. Usain Bolt's business after retirement

12. What is the conversation mainly discussing about Usain Bolt?
    A. His failures in running
    B. His training routine
    C. His titles and nickname as the fastest man
    D. His personal lifestyle
    E. His post-retirement business

13. What does Usain Bolt have in common, according to the texts?
    A. Are American athletes
    B. Are known as the greatest in their sports
    C. Are still competing today
    D. Played tennis
    E. Were born in the 1990s

14. How many Olympic gold medals did Usain Bolt win?
    A. Six
    B. Seven
    C. Eight
    D. Nine
    E. Ten

15. When did Usain Bolt retire?
    A. 2015
    B. 2016
    C. 2017
    D. 2018
    E. 2019

True/False

After listening, decide whether each statement is true or false based on the information in the recording for numbers 16-20.

No.	Statement	True	False
16.	Usain Bolt's nickname "Lightning Bolt" shows his incredible speed. (T/F)		
17.	Bolt's records in sprinting prove his dominance in athletics. (T/F)		
18.	The conversation about Bolt highlights his achievements and why he is respected. (T/F)		
19.	Bolt left strong legacies in sports. (T/F)		
20.	The text suggests that discipline and determination are key to success. (T/F)		

21. What can you infer about the qualities that make great athletes like Serena Williams and Usain Bolt successful?

APPENDIX 5

TIME-ON-TASK OBSERVATION SHEET

Date : _____
Class : _____
Observer : _____
Learning Topic : _____
Observation Duration : _____ minutes (Interval: every ___ minutes)

Instructions for Completion:

1. Write On-Task if students are actively engaged in learning according to the criteria.

2. Write Off-Task column if students show disengaged behavior.

3. Record a brief description of the behavior in the column for each student.

No.	Interval Timing (minutes)	Student 1	Student 2	Student 3	Student 4	Student 5
1	0 – 2					
2	2 – 4					
3	4 – 6					
4	6 – 8					
5	8 – 10					
6	10 – 12					
7	12 – 14					
8	14 – 16					
9	16 – 18					
10	18 – 20					
11	20 – 22					
12	22 – 24					
13	24 – 26					
14	26 – 28					
15	28 – 30					