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IMPROVING STUDENTS' LISTENING COMPREHENSION THROUGH AUDITORY, INTELLECTUALLY, AND REPETITION (AIR) MODEL INTEGRATED CAKE APPLICATION AT GRADE 11 OF SMA NEGERI 4 PEMATANGSIANTAR

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ABSTRAK
This research aimed to find out the effect of the Auditory, Intellectually, and Repetition (AIR) Model integrated with the CAKE Application on students' listening comprehension at grade eleven of SMA Negeri 4 Pematang Siantar. This research used a quantitative method with a quasi-experimental design involving 72 students divided into an experimental class and a control class. The findings showed that the experimental class achieved better improvement than the control class. The result of the t-test showed that the t-observed value (4.37) was higher than the t-table value (1.667). Therefore, the alternative hypothesis (H_a) was accepted, indicating that the AIR Model integrated with the CAKE Application had a significant effect on students' listening comprehension.

Keyword: *Listening Comprehension, AIR Model, CAKE Application*

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1. INTRODUCTION

Language plays an essential role in human life as a means of communication, social interaction, and knowledge exchange. Language also helps individuals build relationships and understand one another in society. Through language, people are able to express their ideas, thoughts, and feelings to others. Oviogun & Veerdee (2020), stated that language is a systematic tool for conveying ideas or feelings by using agreed signs and sounds that contain understandable meanings. This means that language functions as a fundamental medium for delivering messages and constructing meaning in social contexts. Therefore, mastering a language is crucial, especially English, which functions as an international language used globally.

According to Silalahi et al. (2022), English is a crucial language in a globalizing society, and it has declared its status as an international language utilized by the majority of the world's

communities. By mastering English, people are able to communicate with individuals from different countries and access various sources of information such as books, journals, newspapers, media, and educational resources. Without sufficient English proficiency, people may face difficulties in understanding information and communicating effectively. In Indonesia, English is taught as a foreign language and has become a compulsory subject in schools. Students are required to master four language skills: listening, speaking, reading, and writing. Among these skills, listening is considered the first and most fundamental skill that is acquired by humans before the other skills are achieved (Wahyuni, 2020). Listening is not merely hearing sounds, but it is an active process of understanding and interpreting spoken language. Brown (2004) states that listening is an internal process in which listeners actively construct meaning from spoken messages. Through listening activities, students can obtain information, understand instructions, recognize vocabulary, and improve their overall English proficiency.

However, listening comprehension is still considered difficult for many students, especially for learners of English as a Foreign Language (EFL). Students often face difficulties in understanding spoken English because they must process information directly while listening. Several factors influence students' listening difficulties, such as unfamiliar accents, fast speech rates, long listening texts, poor audio quality, limited vocabulary, weak grammatical knowledge, lack of listening strategies, cultural differences, and anxiety when listening to English (Ramadhianti & Somba, 2021). These problems make students unable to identify main ideas, understand detailed information, and interpret spoken messages effectively. Therefore, teachers need to apply appropriate instructional models and interesting learning media to help students improve their listening comprehension.

Learning media have an important role in supporting the teaching and learning process, especially in listening comprehension activities. The use of technology-based learning media can help students become more interested and motivated in learning English. Appropriate media help students better understand the content, provide more concrete information, and foster curiosity (Septiana et al., 2022). One digital learning medium that can support listening activities is the CAKE Application. The CAKE Application provides authentic listening materials through short video conversations spoken by native speakers. It also provides subtitles, pronunciation practice, and repetition features that help students understand spoken English more easily. Through repeated exposure to spoken language, students can improve their vocabulary mastery, pronunciation recognition, and listening comprehension. Previous studies revealed that the CAKE Application effectively improved students' listening ability and increased students' engagement during listening activities (Putri & Siregar, 2024; Usman, 2025; Tryantini, 2025).

Besides learning media, instructional models also influence students' listening achievement. One instructional model that can support students' listening comprehension is the Auditory, Intellectually, and Repetition (AIR) Model. The AIR model emphasizes three important aspects in learning activities, namely auditory exposure, intellectual processing, and repetition. Through auditory activities, students focus on listening to spoken input carefully. The intellectual component encourages students to analyze and interpret the information they hear, while

repetition helps students strengthen their understanding and memory of language input. Brown (2007) explains that repeated exposure to language input helps learners internalize vocabulary, pronunciation, and language patterns more effectively. Previous studies also showed that the AIR model positively affected students' language achievement and receptive skills (Lestari, 2025; Riswanto et al., 2022). Therefore, the AIR model is considered appropriate to improve students' listening comprehension because it actively involves students in the learning process.

Based on the researcher's experience during the Teaching Practice Program (PPL) at SMA Negeri 4 Pematang Siantar, the researcher found several problems related to students' listening comprehension. The average score of students in class XI-7 was 69, while the average score of students in class XI-9 was 49. Both scores were still below the Minimum Mastery Criterion (KKM), which was 75. In addition, students had difficulties in identifying main ideas, understanding spoken texts, recognizing unfamiliar vocabulary, and maintaining concentration during listening activities. The researcher also found that teachers still used conventional media in teaching listening, which made students less interested and less motivated in learning activities. As a result, the teaching and learning process became less effective.

Previous studies mostly discussed the effectiveness of the CAKE Application and the AIR model separately. However, research integrating the AIR model with the CAKE Application in teaching listening comprehension is still limited, especially at the senior high school level. Therefore, the researcher is interested in conducting research entitled "Improving Students' Listening Comprehension through Auditory, Intellectually, and Repetition (AIR) Model Integrated CAKE Application at Grade Eleven of SMA Negeri 4 Pematang Siantar."

2. METHOD

This research used quantitative research with a quasi-experimental design. Quantitative research is a method that uses numerical data and statistical analysis to examine the relationship between variables and test hypotheses (Ary et al., 2010). In this research, the quantitative approach was used because the researcher intended to measure students' listening comprehension scores and identify whether there was a significant improvement after the treatment was given. The quasi-experimental design was used because the researcher could not randomly assign the students into groups since the classes had already been determined by the school. According to Creswell (2014), quasi-experimental research is used to determine the effect of a treatment by comparing two groups, namely the experimental group and the control group.

This research used two classes with different treatments, namely the experimental class and the control class. Before applying the treatment, both classes were given the same pre-test. The experimental class received treatment using the Auditory, Intellectually, and Repetition (AIR) Model integrated CAKE Application, while the control class was taught using the conventional teaching method. After the treatment, both classes were given the same post-test. The results of the post-test from the experimental class and the control class were compared to determine the effect of the Auditory, Intellectually, and Repetition (AIR) Model integrated CAKE Application on students' listening comprehension.

The implementation of the AIR Model integrated with the CAKE Application was conducted systematically in three stages. In the auditory stage, students listened to narrative text videos from the CAKE Application to focus on spoken input and understand the content of the audio. In the intellectually stage, students completed fill-in-the-blank exercises based on the audio they had listened to in order to analyze and interpret the information. In the repetition stage, the audio was played again to help students reinforce their understanding, improve vocabulary recognition, and remember important information from the listening activity. The population of this research consisted of all eleventh-grade students of SMA Negeri 4 Pematang Siantar in the 2025/2026 academic year. The researcher selected class XI-7 as the experimental class and class XI-9 as the control class. Each class consisted of 36 students, so the total sample of this research was 72 students. The researcher used purposive sampling technique because the selected classes showed difficulties in listening comprehension based on the researcher's preliminary observation during the Teaching Practice Program (PPL).

The instrument used in this research was a listening comprehension test in the form of fill-in-the-blank exercises based on narrative texts. The test consisted of 20 items in both the pre-test and post-test. Students listened to an audio recording and completed the missing words based on what they heard. The purpose of the pre-test was to identify students' initial listening comprehension ability before the treatment, while the post-test was used to determine the effect of the treatment on students' listening comprehension after being taught using the AIR Model integrated CAKE Application. The listening comprehension test instrument was validated through a try-out conducted with students outside the research sample to ensure that the test items were understandable and appropriate for the students' level. The researcher also reviewed the clarity and consistency of the test items before administering the pre-test and post-test. Before conducting the research, the researcher obtained official permission from the school to carry out the study. The students were informed about the purpose of the research, and the collected data were used only for academic purposes. The data were analyzed by using the t-test formula to determine whether there was a significant effect of the treatment on students' listening comprehension. The researcher calculated the mean scores, standard deviation, and t-test manually by comparing the post-test results of the experimental and control classes. The level of significance used in this research was 0.05.

3. RESULTS AND DISCUSSION

The findings of this research focused on comparing the students' pre-test and post-test scores in listening comprehension between the experimental class and the control class. The researcher administered the test twice: a pre-test before the treatment to measure the students' initial listening comprehension ability, and a post-test after the treatment to evaluate the students' listening comprehension after receiving different teaching treatments. The experimental class was taught by using the Auditory, Intellectually, and Repetition (AIR) Model integrated CAKE Application, while the control class was taught by using the conventional teaching method. The findings from the post-test showed that the students in the experimental

class achieved higher improvement compared to the students in the control class. This indicates that the Auditory, Intellectually, and Repetition (AIR) Model integrated CAKE Application was more effective in improving students' listening comprehension at Grade Eleven of SMA Negeri 4 Pematangsiantar.

Table 1. Students' Scores of the Experimental class

No	Initial of Students	Pre-Test (X_1)	Post-Test (X_2)
1.	AM	35	55
2	ASR	60	70
3	BP	20	50
4	CSN	35	60
5	EJP	50	75
6	FOS	80	75
7	FS	80	80
8	GJS	35	65
9	GS	35	70
10	GAT	40	60
11	HP	55	70
12	JBMS	45	70
13	JOH	15	25
14	JSR	10	50
15	JS	45	65
16	JKP	70	75
17	KVH	65	70
18	LTSL	25	55
19	LOS	20	50
20	MJS	30	60
21	NAL	50	70
22	NIKL	10	50
23	NARS	55	70
24	NRS	70	75
25	NYVT	30	55
26	NP	15	50
27	OAS	45	50
28	PN	35	70
29	QS	30	60
30	RMP	10	40
31	RP	15	50
32	RYS	40	65
33	ROGS	30	60
34	RA	35	45
35	SCN	30	60
36	YG	15	50

No	Initial of Students	Pre-Test (X_1)	Post-Test (X_2)
	Σ	**1365**	**2180**
	Mean ($\bar{x}$)	**37.92**	**60.56**

According to the table above, the highest score in the pre-test was 80, while the lowest score was 10. In contrast, the post-test recorded the highest score of 80 and the lowest score of 25. In addition, the total score of the pre-test was 1365, resulting in a mean score of 37.92. Meanwhile, the total score of the post-test was 2180, resulting in a mean score of 60.56. The findings indicated that there was a significant improvement in students' listening comprehension after the implementation of the Auditory, Intellectually, and Repetition (AIR) Model integrated CAKE Application.

Table 2. Students' Scores of the Control Class

No	Initial of Students	Pre-Test (X_1)	Post-Test (X_2)
1	AAL	40	60
2	AYP	20	35
3	BJS	10	15
4	DZAP	50	55
5	DSZ	45	55
6	FM	5	15
7	FMP	25	10
8	FS	35	80
9	GOS	45	60
10	HKS	20	0
11	IR	25	25
12	IBS	30	65
13	JWP	25	35
14	JDJS	15	10
15	JVHS	35	55
16	LSMP	35	30
17	MSL	20	55
18	MPPS	20	10
19	MS	40	65
20	MSN	35	35
21	NCAN	25	55
22	PVDS	30	15
23	PNZ	5	15
24	PP	5	10
25	RKMP	85	90
26	RAS	80	70
27	RDAS	10	30
28	RSIS	10	15
29	SMS	40	75

No	Initial of Students	Pre-Test (X_1)	Post-Test (X_2)
30	SBS	10	30
31	THA	5	15
32	TGG	10	35
33	YTHS	50	75
34	YS	30	45
35	ZEN	20	55
36	ZNS	35	60
	Σ	**1025**	**1460**
	Mean ($\bar{x}$)	**28,47**	**40,56**

According to the table above, the highest score in the pre-test was 85, while the lowest score was 5. In the post-test, the highest score was 90 and the lowest score was 0. Furthermore, the total score of the pre-test was 1025, resulting in a mean score of 28.47. Meanwhile, the total score of the post-test was 1460, resulting in a mean score of 40.56. The findings showed that the control class also experienced improvement in listening comprehension, although the improvement was lower than the experimental class.

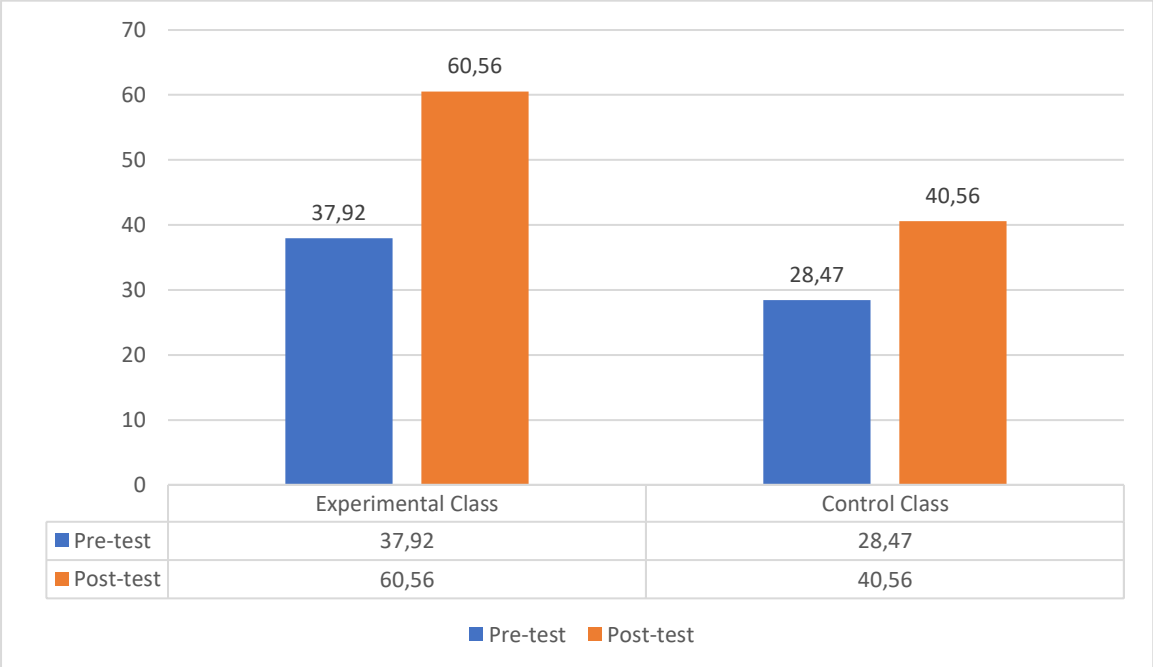

Figure 1. Tabel 3. Improvement in Experimental and Control Class

After calculating the mean scores of both the experimental class and control classes, the researcher illustrated the data through a graph to compare the students' improvement in

listening comprehension. The graph clearly shows that both classes experienced improvement after the teaching and learning process. However, the experimental class demonstrated a more significant improvement than the control class. The students in the experimental class showed greater progress after receiving treatment through the Auditory, Intellectually, and Repetition (AIR) Model integrated with the CAKE Application. The mean score of the experimental class increased from 37.92 in the pre-test to 60.56 in the post-test. In contrast, the control class, which was taught by using the conventional teaching method, showed a smaller improvement, with the mean score increasing from 28.47 in the pre-test to 40.56 in the post-test.

The experimental class achieved an improvement of 22.64 points, while the control class improved by only 12.09 points. These findings indicate that the students who were taught by using the Auditory, Intellectually, and Repetition (AIR) Model integrated CAKE Application achieved better listening comprehension scores compared to those who were taught through the conventional teaching method. Therefore, it can be concluded that the implementation of the Auditory, Intellectually, and Repetition (AIR) Model integrated CAKE Application had a significant effect on students' listening comprehension achievement.

Research Findings

From the results of the data analysis, the researcher found that the Auditory, Intellectually, and Repetition (AIR) Model integrated CAKE Application had a significant effect on students' listening comprehension at grade eleven of SMA Negeri 4 Pematang Siantar. Some of the findings are as follows:

1. The research found that students who were taught by using the Auditory, Intellectually, and Repetition (AIR) Model integrated CAKE Application achieved better listening comprehension than students who were taught by using the conventional teaching method. The students in the experimental class showed greater improvement in understanding listening materials, identifying specific information, and recognizing vocabulary during the learning process.
2. The mean score of the experimental class increased from 37.92 in the pre-test to 60.56 in the post-test, while the mean score of the control class increased from 28.47 in the pre-test to 40.56 in the post-test. The improvement in the experimental class was 22.64 points, whereas the control class improved only by 12.09 points. These results indicate that the experimental class achieved higher progress after receiving the treatment.
3. The result of the statistical analysis using the t-test showed that the value of t-observed was 4.37, while the value of t-table at the significance level of 0.05 with the degree of freedom (df) 70 was 2.00. Since the value of t-observed was higher than the value of t-table (4.37 > 1.667), the null hypothesis (H_0) was rejected and the alternative hypothesis (H_a) was accepted.

Therefore, the researcher concluded that the Auditory, Intellectually, and Repetition (AIR) Model integrated with the CAKE Application significantly affected students' listening comprehension at grade eleven of SMA Negeri 4 Pematang Siantar.

DISCUSSION

After After conducting the research and analyzing the data, the researcher found several findings related to students' listening comprehension achievement. Both the experimental class and the control class showed improvement after the teaching and learning process. However, the improvement in the experimental class was more significant than the control class. The experimental class, which was taught using the Auditory, Intellectually, and Repetition (AIR) Model Integrated CAKE Application, showed greater improvement in listening comprehension scores. The mean score increased from 37.92 in the pre-test to 60.56 in the post-test. Meanwhile, the control class, which was taught using the conventional teaching method, only increased from 28.47 to 40.56.

These findings indicated that the Auditory, Intellectually, and Repetition (AIR) Model integrated with the CAKE Application gave a positive effect on students' listening comprehension. The use of authentic listening materials, repetition activities, and technology-based learning media helped students become more active, motivated, and interested during the listening learning process. Furthermore, the repetition activities in the AIR model helped students better understand vocabulary, identify main ideas, and recognize spoken information more effectively.

The improvement of students' listening comprehension in the experimental class was also influenced by students' engagement during the learning process. The use of the CAKE Application helped students become more interested and motivated because the application provided authentic audio and video materials from native speakers. In addition, the students were more familiar with digital learning media, which helped them participate more actively during listening activities. The visual and audio features of the application also helped students focus more on listening materials and recognize vocabulary more easily.

Furthermore, the implementation of the Auditory, Intellectually, and Repetition (AIR) Model contributed to students' improvement in listening comprehension. In the auditory stage, students focused on listening to spoken input carefully. In the intellectually stage, students analyzed the information from the listening materials by completing the exercises provided by the researcher. Meanwhile, the repetition stage helped students strengthen their understanding through repeated exposure to the audio materials. Brown (2007) stated that repetition helps learners internalize vocabulary, pronunciation, and language patterns more effectively.

The findings of this research are also consistent with previous studies conducted by Putri and Siregar (2024), Usman (2025), and Tryantini (2025), which found that the CAKE Application improved students' listening ability and increased students' engagement during listening activities. In addition, the findings support the study conducted by Riswanto et al. (2022), which revealed that the AIR Model positively affected students' language achievement and receptive language skills. Therefore, the integration of the AIR Model and the CAKE Application can be considered an effective strategy for improving students' listening comprehension. comprehension.

4. CONCLUSION

The results of this research showed that the Auditory, Intellectually, and Repetition (AIR) Model integrated CAKE Application had a significant effect on students' listening comprehension at grade eleven of SMA Negeri 4 Pematang Siantar. The students who were taught using the AIR Model Integrated CAKE Application achieved better improvement compared to the students who were taught using the conventional teaching method. The implementation of auditory activities, intellectual processing, and repetition stages helped students understand listening materials more effectively. In addition, the use of the CAKE Application supported students' engagement and motivation during the listening learning process. Therefore, the integration of the AIR Model and the CAKE Application can be considered an effective strategy for improving students' listening comprehension.

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