

# Empowering Introvert Students: How Artificial Intelligence Applications Enhance Speaking Ability

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## ABSTRACT

The rapid technological advancement has increased the use of Artificial Intelligence (hereafter, AI) applications to improve students' English skills, especially in speaking skills. This study was aimed to examine the effectiveness of AI applications to enhance the introvert students' speaking ability. A pre-experimental, one-group pre-test and post-test design was employed in this study. This study conducted with 85 introvert students from two universities in Riau, Indonesia chosen by using MBTI test and purposive sampling technique. The instruments of this study were a questionnaire and speaking test. The data were analyzed by employing SPSS 25<sup>th</sup> version to find out the descriptive statistic, normality test, and paired sample t-test. This finding shed light AI applications were effective in enhancing speaking ability of introvert students. It has been proven that the t-test was higher than the t-table value (12.823>1.663) with a level of significance  $p<0.05$ . In short, introvert students' speaking ability significantly improved after utilizing AI applications for English speaking practiced. In conclusion, AI applications can be implemented to enhance introverted students' speaking ability.

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## 1. INTRODUCTION

In the 21<sup>st</sup> century, English has been used as a primary language for communication all over the world. Nowadays, many multinational corporations or companies in Indonesia, including in Riau Province require their prospective workers to master English skills, especially speaking skills since they have to use English as their second language when they work and communicate with their colleagues or expatriate employees. Hence, they also conduct job interviews in English with prospective employees in order to determine their speaking ability. Once a person masters speaking skills well, he will get greater opportunity to work in a larger multinational company and achieve better salary (Sutini & Hanifah, 2020). Furthermore, speaking or communication skill is a crucial soft skill for a wide range of profession and in daily life that contributes to employability (Batinca et al., 2013; Karibuse, 2016).

Moreover, speaking ability is needed for survival and adapt in a company. It means that, university students should have good speaking ability if they want to be a success employee in their future career. Thus, speaking skill is a fundamental ability that university students should acquire not just for their academic achievement, but also for their prospective professions.

However, the speaking ability of non-English major student was still low, especially for the introvert students. Based on the researchers' observation on the first semester students in 2022/2023 academic year, the researchers found most of the passive or introvert students have low score in speaking test. They found several problems faced by the students during English speaking class. First, the most challenging English skill for introverted students was speaking. According to Myers-Briggs Type Indicators (MBTI) there are several types of human personality traits, namely introvert and extrovert. These personalities can influence someone's way in communication or speaking with other people (Mahripah, 2014). Extrovert is associated with outgoing, talkative, expressive, confident, enthusiastic and sociable person. Introvert is associated with calm, quiet and solitude person (Parkinson, 2004; Zhang, 2008). In short, in speaking class, the extrovert students were more alive, active, enthusiast and respond the lecturer's questions well, whereas the introvert students were calm, passive, and avoid interacting with others. The introvert students preferred to have one-on-one interaction in a peaceful atmosphere to save their energy, whereas to increase their energy the extroverted students should be connected with others. In a classroom context, the extrovert students enjoy speaking class and express their ideas freely, while the introvert students did not have initiative to express their ideas and lecturers have to encourage them to say something related to the topic. Nevertheless, in accordance with the initial test result between extrovert and introvert students, it was found that extrovert students' speaking ability greater than introvert students. The majority of them achieved low score in speaking test. Thus, the researcher should focus to improve the introvert students' speaking ability since could not communicate well and also lack of understanding of this subject. Furthermore, English speaking is a difficult skill for students since they must understand several crucial components such as pronunciation, grammar, vocabulary, fluency, and comprehension (Leong & Ahmadi, 2017). Once learners improve all aspects it will contribute to their speaking ability namely they can communicate well, pronounce the words clearly, use the words accurately and use relevant grammatical structures based on the topic (Hedge, 2000; Mazouzi, 2013; Thornbury, 2005). Grammatical competence can assist speakers in appropriately using and perceiving language structure, which promotes to fluency (Latha, 2012). It means that, students have to master all of the aspects if they want to have great English speaking skill.

Besides, the participation of the introvert students was quite low in the speaking class. Some of them said that they were afraid of making mistakes and felt shy speaking in front of their friends due to their personality and their language competences namely vocabulary, grammar and pronunciation were also low. The students' English ability can affect their participation level in the whole class discussion. In short, the introvert students were not engaged in the classroom activities since they were lack of vocabulary, grammar and pronunciation. Moreover, they lacked confidence when speaking in front of their friends. The next problem was the limited time period of teaching and evaluation as the second problem for the introvert students since in each session is only taken 100 minutes. Every class consisted of 30 until 35 students; each student has confined duration to communicate since only a student can speak while the rest of the class tries to listen to her or him. Some students dominated in speaking class namely extrovert students, while the introvert students said very little or remained silent. In fact, the introvert students took longer time to speak than the extrovert students. In short, the introvert students should learn and practice their English speaking more often outside school environment to hone their speaking abilities in a serene setting due to their personality.

Previous studies have found that people are unable to master a language unless they have numerous chances for substantial repetition. Spoken language and opportunities to generate the language in meaningful activities give critical practice for internalizing the language. The students can replicate and practice to pronounce the words from their teachers' expression (Leong & Ahmadi, 2017). Therefore, the students should learn and practice their speaking more often inside and outside of

classroom, thus they can acquire many words and enhance their speaking ability. Furthermore, the teaching methods used by the lecturer were not appropriate with the introvert students. The lecturers taught speaking to all students by using the same method namely discussion, interview, role-play, presentation, etc. These methods were not effective to improve the introvert students' speaking ability. In addition, the lecturers had not instructed the introvert students to use technology or applications to improve their speaking skill outside the classroom. Therefore, the lecturers should choose the most interesting method or approach-based technology that encourages the introvert students' motivation in improving their speaking skill. Thus, the researchers were encouraged to use AI applications in solving the problem experienced by introvert students in speaking class. AI has given great contribution to the field of education (Malik et al., 2019) that can employ a novel method in English teaching and learning due to its good environment for engaging English learning (Wang, 2019). The use of AI in enhancing learning can engage students' motivation since it uses new method, supports teacher in teaching subject more effectively and efficiency in the classroom. Besides, it can be used without the presence of teachers since it enables students to study autonomously and receive personalized feedback (Michael, 2016; Underwood & Luckin, 2011; Wang, 2019). AI is not only motivating the students in learning with different varieties of abilities and styles, but also it promotes students' autonomous learning, monitor their performances and assess their skills (Fahimirad & Kotamjani, 2017). In short, AI applications can promote students' autonomous learning and motivate them in learning, but it still cannot thoroughly substitute the teachers' role.

There are numerous researchers performed researches towards the use of AI powered virtual speaking coaches and they found the use of AI applications can enhance their students' speaking ability. First, Zou et al. (2023) have conducted experimental research to their university students of the use of AI applications in increasing English speaking ability namely EAP Talk, IELTS Liulishuo and Yidian English. Their finding revealed that using AI application was effective in increasing students' speaking ability. Next, Junaidi et al. (2020) carried out quasi-experimental research to their students of the implementing Lyra virtual assistance to improve speaking skill. This study indicated AI application could enhance the students' speaking skill. In addition, Ali (2020) conducted quasi-experimental research to investigate the improvement of students' speaking skills after using Google Assistant. This study showed that students' speaking ability improved significantly after integrating AI application. Furthermore, Zhou et al. (2020) added that the students had positive attitude and preferred to use AI namely Chivox, iFlytek and Liulishuo for IELTS applications in improving their speaking skills. Based on the previous findings above, it can be concluded that the use of AI applications in English teaching and learning are effective in improving students' speaking ability since they can practice their English anywhere and anytime, with or without the presence of teacher. Nevertheless, more researches on the utilization of AI applications in learning speaking are still needed since there are so many applications that are not explored yet in speaking learning. Moreover, speaking is a fundamental skill that students should have since it is used to communicate and interact with people all over the world.

Many famous AI based smartphone applications can be used in learning English. However, in this study the researchers were encouraged to investigate the effect of AI applications that use as speaking coaches namely, Duolingo, ELSA speak, and Orai to improve the introvert students' speaking ability. All of these applications employ AI driven speech recognition and can be used as virtual reality simulation for practising their English speaking. The researchers used these three applications purposely since the students can utilize them easily on their smartphone. Furthermore, through the use of these applications the students could try several AI application atmospheres, they could choose which application they preferred and the learning environment would not be monotonous. Besides, there are several reasons considered by the researchers in choosing these three AI applications such as these applications are flexible to use, user-friendly and affordable. Each application has unique features that boost students' motivation namely graphics, sounds, voice recognition, score and feedback. The students can interact directly with human-like native speakers and get self-correction. In addition, the researchers and five introvert students have tried these applications before implementing to the

participants of this study. Furthermore, these applications also in line with the students' need and English course objectives.

The first application used in this study was ELSA (English Speaking Assistant) application developed by Vu Van and Xavier Anguera in 2015. It employs artificial intelligence namely automatic speech recognition (ASR) to train students' English pronunciation accuracy and provide feedback depends on their abilities. It has the main feature of speaking progress contained word bank, score and evaluation (Becker & Edalatishams, 2019). ELSA speak is modest and user-friendly since it guides the students through several topics, skills, levels, reports and many more. Students respond the questions given by ELSA and express their ideas by recording their voices in the form of phrases or sentences, and then they receive feedback according to their pronunciation accuracy in the form of percentage and report. The second application employed by the researchers was Duolingo. It was invented by Luis von Ahn and Severin Hacker in 2011. Is a language games mobile application that is famous in learning languages and it has achieved many awards as the best education start up. It has many interesting gaming features namely topics, levels, sounds, graphic, point and lingots. These gaming features could improve the students' motivation and persistent in using and learning English that contribute to their English achievement (Warman, 2019). It promotes students' grammar, vocabularies, translation and also the four English abilities such as speaking, listening, writing and reading. In regard to speaking, the students have to respond to the questions given and record their voice to get feedback or score from Duolingo. The third application implemented in this study was Orai. It was found by Aasim Sani, Danish Dhamani and Paritosh Gupta in 2016. This application was designed to teach and coach users to become effective speakers independently. Its purpose is to offer people all around the world the confidence and abilities to communicate confidently in front of others in everyday situations and acts as a speech coach for individuals (Takahashi, 2017). It is also popular for public speaking practices for its benefit in recording speech and giving instant feedback to the users' speaking abilities. This application also instructs users on how to utilize worthless filler words and solution to the problems made by users. Furthermore, users can determine if the person speaks too frequently, quickly, or slowly. It informs users to what extent she or he is pronouncing words and measuring speaker's rate of speech. In addition, these applications have been proven can be implemented in improving speaking skill since they are convenient, flexible, affordable and motivate students in English speaking.

The researchers assumed that the use of these applications was appropriate with the students' need in English speaking since the applications have approved by the previous researchers could be implemented to improve students' speaking ability. Each application has its uniqueness namely ELSA that might be implemented to enhance students' listening and speaking skills; Duolingo can improve not only the students' speaking ability but also listening, reading, writing, grammar, vocabulary, and translation; Orai can increase the students' public speaking in order to enhance their self-confidence. Furthermore, these applications can track the students' learning progress and evaluate their English speaking practiced by giving instant feedback. Hence, it was the reason for the researchers to use these three AI applications to the students for practicing their English speaking inside and outside of the classroom.

Although several previous researchers have conducted researches on the implementation of AI applications in improving speaking skill at high schools and university level, but there is still limited study investigate the implementation of AI in enhancing speaking ability specifically on introvert university students. However, the researchers need to explore the students' English ability accordance with their personality. In addition, different from the previous studies explored the implementation of AI applications in English learning namely action research, quasi-experimental and case study design; in this study the researchers would conduct pre-experimental one group pre-test and post-test design to fill the research gap. Hence, the purpose of this research was to investigate the effectiveness of AI applications to enhance introvert students' speaking ability in tertiary level. The following research questions guided this study:

- 1) To what extent the use of artificial intelligence applications can enhance introvert students' speaking ability?
- 2) Are AI applications effective in improving introvert students' speaking ability?

## 2. METHODS

This study was aimed to investigate the effectiveness of AI applications to improve the introvert students' speaking ability. This study employed pre-experimental research with one group pre-test and post-test design. The participants of the study were 85 students from two universities in Riau, Indonesia majoring in Computer Science, Information Technology, Management, and Accounting. The participants were chosen by using purposive sampling technique. They were second semester students that enrolled English course subject in 2022/2023 academic year. This study was conducted from February until May 2023.

The questionnaire and speaking test were used to collect the data. There were several steps conducted by the researchers in collecting the data. First, the questionnaire used to ascertain the students' personality traits namely extrovert and introvert. In this study, the researchers focused on the introvert students since they experienced difficulties in their speaking ability. The researchers' adapted Myers-Briggs Type Indicators (MBTI) test questionnaire contained of 70 questions to identify the students' personality. This questionnaire employed Likert-scale namely from strongly agree to strongly disagree. The students did the questionnaire about 15-20 minutes through MBTI websites. The result of this test automatically determined by the expert system of the websites after the students finished the test. This test was reliable to use since it has been implemented to identify personality of many people all over the world (Sanjaya et al., 2015; Wakamoto, 2007). After identifying those students who are categorized as introvert, the researcher chose 85 students who agreed to participate in this research.

Furthermore, the speaking test was utilized as pre-test and post-test that was constructed based on the curriculum or syllabus since the researchers employed content validity. The reliability of vocabulary and speaking test was examined through inter-rate reliability done by two examiners or English lecturers from University of Riau. It could be concluded the speaking test were valid to be employed in this study. In addition, the questions in the speaking test were constructed based on the topics and indicators contained in the English syllabus for the second semester namely Describing People and Facts, Giving Opinion and Giving Instruction in Presentation. These topics can be employed to assess the students' speaking ability (Brown, 2004; Hughes, 2003). The speaking test was conducted at the first meeting (pre-test) and the ninth meeting (post-test). In these tests each student had five until seven minutes to answer three questions and the researchers recorded the students' voice while they were speaking so that it could help the researchers in analysing the data.

The pre-test was administered to the students in order to find their pre-existing speaking ability. Next, the treatments were conducted for eight meetings. In the treatment, the introvert students used AI applications for practicing their English speaking inside and outside of the classroom. They were encouraged to practice their speaking through AI applications namely ELSA Speak, Duolingo and Orai. The students were guided by the lecturers to utilize AI applications in the classroom in the first until the third meeting since they were not familiar with ELSA Speak, Duolingo and Orai. In the first meeting, the students studied to use ELSA speak and practiced English speaking by choosing the topic about job opportunities and education. In the next meeting, the students practiced their English speaking through Duolingo; they focused on speaking and vocabulary topics. In the third meeting, they learned how to utilize Orai and chose the topic about everyday communication and work presentation. For the next meetings, the researchers asked the students to practice their English through the application they preferred inside or outside classroom. Besides, the researchers also monitored and approached them to be more confident and active during teaching and learning activities. Thus, they practiced their speaking skill not only fully via AI applications, but they also practiced speaking with their real friends in the classroom and engaged in the classroom session. Furthermore, after practicing their English for eight meetings by using AI applications, the post-test was administered to the

students. The post-test was utilized to investigate the improvement made by the students after the treatment and the effectiveness of AI applications on their speaking ability.

Afterwards, the speaking tests were assessed based on the scoring speaking rubric proposed by Brown (2004) consisted of several components namely pronunciation, grammar, vocabulary, fluency, and comprehension. It means that, the indicators of the students' success in speaking when they improved these aspects significantly. Thus, the researchers adapted the scoring criteria initiated by Brown for the speaking test. The scoring speaking rubric can be shown in Table 1.

**Table 1.** The Scoring Rubric of Speaking Proficiency

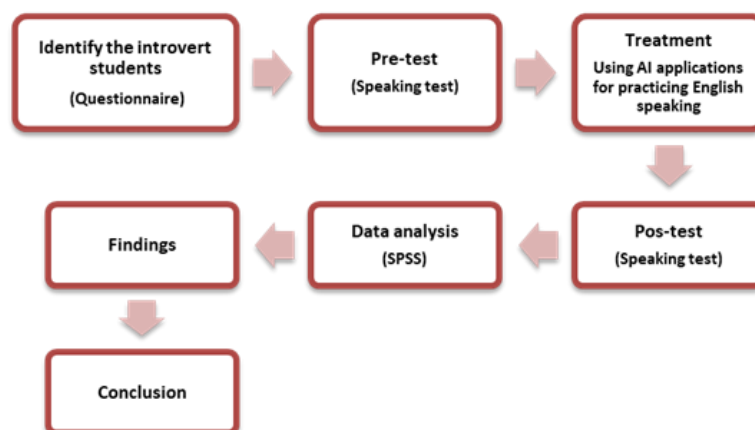
Score	Pronunciation	Grammar	Vocabulary	Fluency	Comprehension
1	Errors in pronunciation are frequent but can be understood by a native speaker used to dealing with foreigners attempting to speak his language.	Errors in grammar are frequent, but the speaker can be understood by a native speaker.	Speaking vocabulary inadequate to express anything but the most elementary needs.	No specific fluency description. Refer to the other four language areas for the implied level of fluency.	Within the scope of his very limited language experience, can understand simple questions and statements if delivered with slowed speech, repetition, or paraphrase.
2	The accent is intelligible though often quite faulty.	Can usually handle elementary construction quite accurately but does not have thorough or confident control of the grammar.	Has speaking vocabulary sufficient to express himself simply with some circumlocutions.	Can handle with confidence but not with facility most situations, including introductions and casual conversation about current events, as well as work, family, and autobiographical information.	Can get the gist of most conversations on non-technical subjects (i.e., topics that require no specialised knowledge.
3	Errors never interfere with understanding and rarely disturb the native speaker. The accent may be obviously foreign.	Control of grammar is good. Able to speak the language with sufficient structural accuracy to participate effectively in most formal and informal conversations on practical, social, and professional topics.	Able to speak the language with sufficient vocabulary to participate effectively in most formal and informal conversations on practical, social, and professional topics. The vocabulary used is broad enough that he rarely has to grope for a word.	Can discuss particular interests of competence with reasonable ease. Rarely has to grope for words.	Comprehension is quite complete at a normal rate of speech.

4	Errors in pronunciation are quite rare.	Able to use the language accurately on all levels normally pertinent to professional needs. Errors in grammatical are quite rare.	Can understand and participate in any conversation within the range of his experience with a high degree of precision in vocabulary.	Able to use the language fluently on all levels normally pertinent to professional needs. Can participate in any conversation within the range of the experience with a high degree of fluency.	Can understand any conversation within the range of his experience.
5	Equivalent to and fully accepted by educated native speakers.	Equivalent to that of an educated native speaker.	Speech on all levels is fully accepted by educated native speakers in all its features including breadth of vocabulary and idioms, colloquialisms, and pertinent cultural references.	Has complete fluency in the language such that his speech is fully accepted by educated native speakers.	Equivalent to that of an educated native speaker.

Brown (2004:172-173)

First, each student's overall speaking score was calculated by adding the five components of speaking namely pronunciation, grammar, vocabulary, comprehension and fluency. Since the final maximum score is 100, the overall score was then multiplied by 4. As a result, if a student has a total score of 20, the student's score for the speaking ability is 80.

Next, the students' speaking scores were analysed by comparing their score taken from the pre-test and the post-test. The data were analyzed by using SPSS 25<sup>th</sup> version to find out descriptive statistic, normality test and paired sample t-test. Descriptive statistic was employed to find the mean, standard deviation, mode of the students' score in the pre-test and post-test. The normality test was done by using Kolmogorov-Smirnov to examine whether the data in the pre-test and post-test is normally distributed or not before testing the hypothesis. In addition, the paired sample t-test result was performed to examine the research hypotheses. The research hypotheses of this study as following:  
H<sub>1</sub>: AI applications were effective in enhancing the introvert students' speaking ability.  
H<sub>0</sub>: AI applications were not effective in enhancing the introvert students' speaking ability.  
The researchers conducted the study based on the research framework can be seen in Figure 1.



**Figure 1.** The Research Framework.

### 3. FINDINGS AND DISCUSSION

The objective of this research was to examine the effectiveness of AI applications in enhancing the introvert students' speaking ability. In order to achieve this objective, questionnaire and speaking test were employed to collect the data. First, the researchers identify the students' personality by using MBTI questionnaire and the pre-test was distributed to 85 introvert students in order to find their pre-existing speaking ability. Secondly, the treatments were conducted for eight meetings which the introvert students were encouraged to practice their speaking through AI applications namely ELSA Speak, Duolingo and Orai. At the end of the meeting, they were evaluated by employing post-test. Then, the results of the tests were calculated through descriptive statistics, normality test, and paired sample t-test using SPSS 25<sup>th</sup> version.

The first testing conducted by the researchers was the descriptive statistic to find the mean, standard deviation and mode of the students' speaking score in the pre-test. The findings would answer the first question of this research. The result of the pre-test is presented in the Table 2.

**Table 2.** Descriptive Statistics of Students' Speaking Ability in Pre-test

Pre-test	
<b>N Valid</b>	<b>85</b>
<b>Missing</b>	<b>0</b>
<b>Mean</b>	<b>59,1059</b>
Std. Error of Mean	1,1230
<b>Median</b>	<b>60,0000</b>
Mode	56,00
Variance	107,1910
Std. Deviation	10,3533
Minimum	40,00
Maximum	80,00
Range	40,00
Sum	5.024,00

Table 2 reveals that the mean score is 59.10, the mode is 56 and the standard deviation is 10.35. Furthermore, the highest score in the pre-test is 80 that achieved only by 3 students and the lowest score is 40. The majority of the students got score below 80 (56-72) in the pre-test.

Furthermore, after the students used AI applications in practicing their speaking for eight meetings, the post-test was administered in order to investigate their speaking ability after the treatment. The result of the post-test can be shown in Table 3.

**Table 3.** Descriptive Statistics of Students' Speaking Ability in Post-test

Post-test	
N Valid	85
Missing	0
Mean	72,0941
Std. Error of Mean	0,9396
Median	72,0000
Mode	68,00
Variance	75,0387
Std. Deviation	8,6625
Minimum	52,00
Maximum	88,00
Range	36,00
Sum	6.128,00

Table 3 shows that the mean score is 72.09, the mode is 68 and the standard deviation is 8.66. Furthermore, the highest score in the pre-test is 88 that achieved by 8 students and the lowest score is 52. The majority of the students got score of 65-80 in the post-test. It means that the students' scores of speaking in the post-test are greater than in the pre-test.

Next, the findings indicate that there are also improvements on each component of the speaking proficiency scoring namely pronunciation, grammar, vocabulary, fluency and comprehension in the pre-test and post-test. The students' speaking ability comparison in the pre-test and post-test is shown in Figure 2.

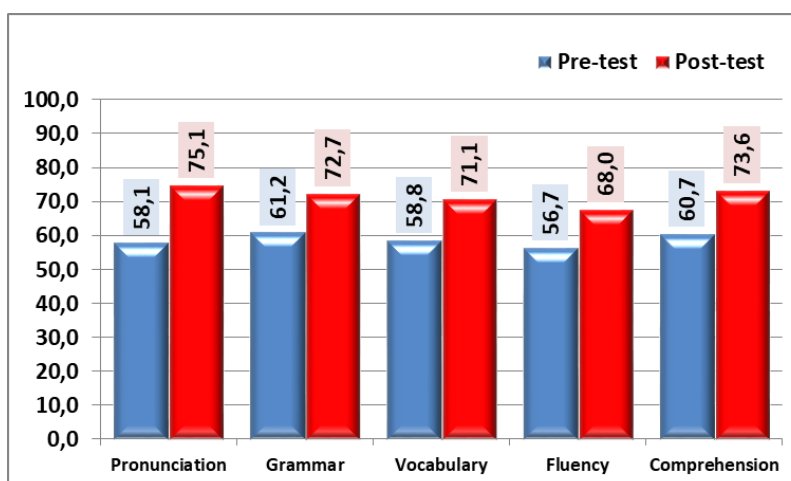
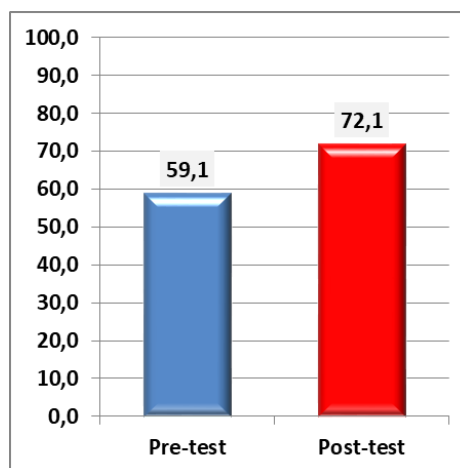
**Figure 2.** The Comparison of Each Component of Speaking Scoring in the Pre-test and Post-test

Figure 2 presents that there are improvements on the students' speaking ability in terms of pronunciation, grammar, vocabulary, fluency and comprehension. The mean score of pronunciation from pre-test to post-test improve 16.9 point since the students were advised to practice their pronunciation through ELSA, Duolingo and Orai application in and out of classroom. Next, the students' grammar increases from 61.2 in the pre-test become 72.7 in the post-test. Their average score on vocabulary also shows better improvement on the post-test which is from 58.8 become 71.1. The researchers found that the students' improvement on grammar and vocabulary due to the features and exercises in the Duolingo often used by the students could enhance their grammar and vocabulary mastery. Consequently, the improvement on students' pronunciation, grammar and vocabulary contributed to the other components of speaking namely fluency and comprehension. Besides, the introvert students were more actively participated in the classroom since their pronunciation, grammar and vocabulary better than before using AI applications. Therefore, they seemed more confident in expressing their ideas or opinions during a whole class discussion. Thus, there are improvement on

their score on fluency increased from 67.7 to 68 and the average score on comprehension increased from 60.7 to 73.6. It means that there is 13 point improvement from pre-test to post-test on students' fluency and comprehension. Obviously, the improvement on all components of speaking ability, thoroughly improve the students' speaking ability. Finally, the students' overall speaking ability comparison in the pre-test and post-test is shown in Figure 3.



**Figure 3.** The Comparison of Students' Mean Score in the Pre-test and Post-test

The result in Figure 3 reveals that it is crystal clear there is improvement in the mean score of the students' speaking ability from pre-test and post-test. The mean score in the pre-test is 59.1 has significantly increase to 72.1 in the post-test. In short, there is 13 point improvement on students' speaking ability after they used AI applications. It can be concluded that AI applications could enhance speaking ability of introvert students.

Furthermore, before examining the research hypotheses, the researchers performed a normality test by using Kolmogorov-Smirnov. The normality test was utilized to investigate whether the data in each variable has normal distribution to test the hypotheses. In order to achieve the assumption, the data from the pre-test and post-test must be distributed normally. Table 4 displays the result of the normality test done by the researchers.

**Table 4.** Normality Test Result

	Kolmogorov-Smirnov <sup>a</sup>		
	Statistic	df	Sig.
Pre-test	.093	85	.063
Post-test	.098	85	.071

The results from the table above demonstrate that the value of significance is higher than  $\alpha$  (0.05). The pre-test significance of normality is 0.63 and the post-test significance of normality is 0.71. In short, the data are normally distributed since the value of significance 0.63 and 0.71 > 0.05. Hence, the result can be used to test the hypotheses.

Finally, paired sample t-test was performed to investigate the significant difference on the introvert students' speaking ability in the pre-test and post-test. The finding was used to answer the second research questions and to examine the hypotheses. The result of the test is presented in Table 5.

**Table 5.** Paired Sample T-Test Result

		Paired Samples Test							
		Paired Differences			95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper				
Pair 1	Pre-test and Post-test	12,98824	9,33821	1,01287	10,97403	15,00244	12,823	84	.000

Table 5 demonstrates that the t-test value is better than t-table value ( $12.823 > 1.663$ ) with the significance level  $p < 0.05$  ( $p = 0.000$ ). In short, there is significant difference between the result of pre-test and post-test of introvert students. In addition, the alternative hypothesis ( $H_1$ ) was approved, whereas the null hypothesis ( $H_0$ ) was dismissed since the value of t-test  $>$  t-table. Therefore, AI applications are effective in enhancing speaking ability of introvert students.

This finding was congruent with the research performed by Han (2020), Makhoulf (2021) and Zou et al. (2023), who found that AI applications are effective in improving students' speaking ability. AI application could use to hone the aspects of speaking namely pronunciation, grammar, vocabulary, fluency and comprehension of the students that contributed to the students' speaking achievement. Afterwards, the technology aspect of AI also increases the students' motivation and autonomous learning since it is match with the students' need and their life-style. They can practice their English speaking anywhere and anytime, with or without the presence of lecturers.

#### 4. CONCLUSION

AI applications were effective in enhancing the introvert students' speaking ability. There was significant improvement on the introvert students' speaking ability after using AI applications for English speaking practiced. Furthermore, this study could give more insight on AI integration in teaching and learning English to enhance students' speaking ability, especially for introvert students. Nevertheless, this study still needs more exploration on the influence of introvert students' motivation and learning style on their speaking ability through the use of AI applications. Thus, it was recommended to future researchers to examine about relationship between motivation and learning style of introvert students on their speaking achievement.

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