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The Effectiveness of the Elsa Speak Application in Enhancing Students' Pronunciation Ability at SMK Yadika Palu

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ABSTRACT

This study was conducted to address the problem of low pronunciation ability among EFL students, particularly in producing accurate phonemes and applying correct word stress, which is caused by limited practice, low confidence, and lack of motivation. The objective of this study was to investigate the effectiveness of the ELSA Speak application in improving students' pronunciation ability at SMK Yadika Palu. This study employed an applied quantitative research method using a quasi-experimental design involving an experimental group and a control group. The participants were 40 eleventh-grade students, equally divided into two groups. The experimental group received pronunciation instruction using the ELSA Speak application, while the control group received conventional pronunciation instruction. Data were obtained through pre-test and post-test assessments focusing on phoneme articulation and word stress and were analyzed using descriptive statistics, the Shapiro–Wilk normality test, the Mann–Whitney U test, and effect size calculation. The results showed that both groups had similar pre-test mean scores, indicating comparable initial pronunciation ability. However, the post-test results revealed that the experimental group achieved a significantly higher mean score than the control group. The Mann–Whitney U test indicated a statistically significant difference ($p < 0.05$) with a very large effect size, demonstrating that the ELSA Speak application had a strong positive effect on students' pronunciation improvement. Therefore, this study concludes that ELSA Speak is an effective Mobile-Assisted Language Learning (MALL) tool for enhancing pronunciation instruction in vocational high school contexts.

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1. INTRODUCTION

English is an international language that plays a crucial role in global communication, particularly in educational contexts where students are required to develop

communicative competence. Speaking skills are considered a key component of language proficiency [1], and pronunciation plays a vital role in effective oral communication [2]. Accurate pronunciation allows speakers to convey meaning clearly and reduces the risk of misunderstanding in spoken interaction [3]. Pronunciation mastery involves several aspects, including phoneme articulation and word stress, which significantly influence intelligibility and comprehensibility in spoken English. Previous studies have shown that Indonesian EFL learners often experience pronunciation problems due to differences between English and their first language phonological systems [4], [5]

In the Indonesian EFL context, pronunciation difficulties remain a persistent issue. Learners frequently struggle to produce unfamiliar English sounds and diphthongs that do not exist in their native languages, resulting in pronunciation errors that affect communication clarity [6], [7]. These problems are also influenced by limited speaking practice, lack of exposure to authentic English input, and insufficient corrective feedback during classroom instruction [7]. Such challenges were also identified among students at SMK Yadika Palu. Based on preliminary observations, students demonstrated varying levels of pronunciation ability, reflecting differences in educational background and limited opportunities to use English, particularly among students from rural areas. In addition, psychological factors such as low confidence, fear of making mistakes, and low learning motivation further hindered students' active participation in speaking activities.

As a result, many students at SMK Yadika Palu struggled with basic pronunciation components, including producing English phonemes accurately and applying appropriate word stress patterns. These conditions suggest that conventional pronunciation teaching methods may not be sufficient to address students' learning needs, especially in vocational high school contexts where practical communication skills are highly required. Therefore, innovative teaching approaches that provide more practice opportunities and immediate feedback are necessary to improve students' pronunciation ability.

In response to this issue, the integration of technology in language learning has been widely recognized as a potential solution. Mobile-Assisted Language Learning (MALL) enables learners to practice language skills flexibly anytime and anywhere using mobile devices. Several studies have shown that mobile-based pronunciation applications can support learners by providing repeated practice and opportunities for autonomous learning [8]. One technological tool that has gained considerable attention in pronunciation instruction is ELSA Speak (English Language Speech Assistant), an Artificial Intelligence (AI)-based application designed to improve learners' pronunciation through Automatic Speech Recognition (ASR) technology [9], [10], [11], [12], [13].

Previous studies have reported positive impacts of ELSA Speak on students' pronunciation development. Anggraini [14] found that the use of ELSA Speak significantly improved students' pronunciation accuracy, while Darsih [15] revealed that students responded positively to the application and felt more confident in speaking activities. Similarly, Gelu [16] reported that ELSA Speak enhanced students' pronunciation performance and engagement in speaking tasks. These findings indicate that ELSA Speak provides effective pronunciation practice through immediate feedback and individualized learning, which are often limited in traditional classroom instruction.

Despite these positive findings, most previous studies focused on general pronunciation improvement, students' perceptions, or were conducted in general senior high school contexts. Research that specifically examines detailed pronunciation components—such as phoneme articulation and word stress—within vocational high school settings remains limited. This limitation highlights a research gap that needs further investigation, particularly in the context of vocational education, where communicative competence is essential for students' future careers.

Therefore, the present study proposes using the ELSA Speak application as a problem-solving approach to improve students' pronunciation at SMK Yadika Palu. The objective of this study is to investigate the effectiveness of ELSA Speak in enhancing the pronunciation of vocational high school students, particularly in phoneme articulation and word stress, using a quantitative quasi-experimental research design. By comparing an experimental group taught using ELSA Speak and a control group taught through conventional instruction, this study seeks to provide empirical evidence on the application of MALL in vocational high school contexts.

The results of this study are expected to offer both theoretical and practical benefits. Theoretically, this research contributes to the development of pronunciation teaching strategies by strengthening empirical evidence on the effectiveness of AI-based mobile applications in EFL learning. Practically, the findings are expected to assist English teachers in vocational high schools by introducing an innovative instructional tool that encourages autonomous learning, increases students' motivation, and builds confidence in speaking English. Ultimately, this study is expected to support more effective pronunciation instruction that aligns with the communicative needs of vocational students in real-world contexts.

2. METHOD

This research employed a quantitative approach using a quasi-experimental design, specifically the non-equivalent control group pre-test and post-test design [17]. This design was selected to examine the effectiveness of the ELSA Speak application in enhancing students' pronunciation ability at SMK Yadika Palu. Quasi-experimental designs are widely used in educational research to measure the impact of instructional interventions when random assignment is not possible, while still allowing comparison between an experimental group and a control group [18].

In this design, two groups of participants were involved. Both groups were given a pre-test to measure their initial pronunciation ability, followed by treatment: the experimental group received only the ELSA Speak application, while the control group received conventional pronunciation instruction. After the treatment period, both groups were given a post-test to measure improvement. The design can be symbolized as follows:

Experimental Group : O_1 X O_2
Control Group : O_3 O_4

Where:

O_1 = Pre-test for the experimental group
X = Treatment using the ELSA Speak application
O_2 = Post-test for the experimental group
O_3 = Pre-test for the control group
O_4 = Post-test for the control group

The study population consisted of eleventh-grade students at SMK Yadika Palu in the 2025 academic year. The sample was selected using purposive sampling, which allows researchers to choose participants based on characteristics relevant to the research objectives. The participants were 40 students, divided into two classes: 20 in the experimental group (XI TJKT) and 20 in the control group (XI Teknologi Farmasi). These two classes were selected based on the English teacher's recommendation, as they had relatively similar academic characteristics and learning behaviors, making them appropriate for comparison.

The independent variable of this study was the use of the ELSA Speak application, while the dependent variable was students' pronunciation ability. Pronunciation ability in this study was measured through two main components: phoneme articulation and word stress accuracy. These aspects were chosen because they are essential to producing intelligible spoken English and are common difficulties for EFL learners.

The main instrument used in this research was a pronunciation test administered as a pre-test and post-test. Students were asked to pronounce a structured list of English words targeting phoneme accuracy and word stress. Their performances were recorded and assessed using a pronunciation scoring rubric adapted from the ELSA Speak assessment system, which classifies students' pronunciation ranging from very poor to excellent. In addition, an observation sheet was used during treatment sessions to document students' engagement, participation, confidence, and responsiveness to feedback.

The treatment was conducted over six meetings. The first meeting was used to administer the pre-test to both groups. In the experimental group, students practiced pronunciation using ELSA Speak in the following meetings through interactive exercises related to classroom topics such as giving opinions and expressing hopes and plans. During the practice, students received immediate feedback and scores from the application, which allowed them to identify errors and self-correct through repeated practice. Meanwhile, the control group received conventional pronunciation instruction through teacher-led explanation, repetition drills, and reading aloud activities without using the application. The last meeting was used to administer the post-test to both groups using the same assessment format.

The collected data were analyzed using quantitative statistical techniques. Descriptive statistics, including mean, minimum, maximum, and standard deviation, were used to summarize students' pronunciation performance in both groups. A Shapiro–Wilk normality test was conducted to examine whether the data were normally distributed. Since the data did not meet the assumption of normality ($p < 0.05$), a non-parametric statistical test was applied. The Mann–Whitney U Test was used to compare the post-test scores between the

experimental and control groups and determine whether there was a statistically significant difference after the treatment. The results were interpreted at the $p < 0.05$ significance level. In addition, the effect size (r) was calculated to assess the magnitude of ELSA Speak's impact on students' pronunciation improvement.

3. RESULTS AND DISCUSSION

The results of this study indicate that the ELSA Speak application significantly improved students' pronunciation ability at SMK Yadika Palu. Students in both groups showed similar pronunciation performance before the treatment, as reflected in the pre-test mean scores of 47.75 for the control group and 47.60 for the experimental group. After the treatment, the experimental group demonstrated a substantial improvement, achieving a post-test mean score of 79.15, while the control group only improved moderately to 54.20. This indicates that students who practiced pronunciation with ELSA Speak made greater progress in phoneme articulation and word stress accuracy than those who learned through conventional methods. Statistical analysis also supported this improvement. The Shapiro–Wilk normality test showed that the data were not normally distributed ($p < 0.05$), so a non-parametric test was applied. The Mann–Whitney U Test revealed a statistically significant difference between the post-test scores of the two groups ($U = 0.000$, $Z = -5.43$, $p = 0.000 < 0.05$), indicating that the improvement in the experimental group was not due to chance. Furthermore, the effect size calculation yielded $r = 0.86$, indicating a very large effect. These findings confirm that the ELSA Speak application is an effective learning tool for enhancing students' pronunciation, providing immediate feedback, guided practice, and interactive features that support students' confidence and accuracy in producing English sounds.

3.1. Results

Before the treatment, a pre-test was conducted to measure students' initial pronunciation ability. The pre-test was administered to both the experimental group (XI TJKT) and the control group (XI Teknologi Farmasi). The purpose of the pre-test was to identify students' baseline pronunciation performance before the experimental group received treatment using the ELSA Speak application. The pre-test was conducted individually and focused on students' pronunciation accuracy, especially in phoneme articulation and word stress. Students were asked to pronounce a series of English words and short phrases, and their pronunciation was assessed using the automated scoring system provided by the ELSA Speak application. Each student's total score was converted to a 100-point scale.

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Table 1. Pre-Test Result of Control Group (Farmasi)

No	Student	Score
1	NSK	44
2	NFB	41
3	NMG	49
4	WND	43
5	NRS	41
6	RA	48
7	CA	45
8	NNAL	51
9	ZIR	40
10	S	53
11	NFA	45
12	UF	49
13	YPA	50
14	SBA	48
15	GMW	55
16	FS	45
17	ND	49
18	NMM	55
19	N	53
20	AM	51
	Mean	47.50
	Minimum	40
	Maximum	55
	Std deviation	4.60

The results show that students' pronunciation ability in the control group remained moderate before the treatment. The mean score was 47.75, with a minimum of 40 and a maximum of 55. This indicates that most students still face difficulties in pronouncing English sounds accurately and applying correct word stress.

Table 2. Pre-Test Result of Experimental Group (TJKT)

No	Name	Score
1	MZK	49
2	S	40
3	FNR	45
4	A	41
5	MAMY	43
6	BA	47
7	MI	44
8	MR	52
9	NB	48
10	TAP	44
11	NTMD	47
12	F	41
13	DQ	50
14	NR	48
15	NP	55
16	MUP	46
17	NKSW	49
18	RDN	56
19	M	53
20	A	54
	Mean	47.60
	Minimum	40
	Maximum	56
	Std deviation	4.74

The results show that students' pronunciation ability in the experimental group before treatment was also moderate. The mean score was 47.60, with a minimum of 40 and a maximum of 56. This indicates that both groups had relatively similar pronunciation ability before the treatment, meaning the groups were comparable at the beginning of the study.

After the treatment was completed, a post-test was administered to both groups. The post-test used the same pronunciation assessment criteria as the pre-test and was evaluated using the ELSA Speak application, focusing on phoneme articulation and word stress accuracy. The purpose of the post-test was to measure students' pronunciation improvement after the experimental group received treatment using ELSA Speak, while the control group continued learning through conventional methods.

Table 3. Post-Test Result of Control Group (Farmasi)

No	Student	Score
1	NSK	50
2	NFB	45
3	NMG	52
4	WND	49
5	NRS	47
6	RA	56
7	CA	57
8	NNAL	51
9	ZIR	45
10	S	58
11	NFA	51
12	UF	55
13	YPA	59
14	SBA	54
15	GMW	61
16	FS	55
17	ND	57
18	NMM	63
19	N	60
20	AM	59
	Mean	54.20
	Minimum	45
	Maximum	63
	Std deviation	5.33

The result shows that students' pronunciation ability in the control group improved after learning through conventional methods. The mean score increased from 47.75 in the pre-test to 54.20 in the post-test. Although students showed progress, the improvement was relatively modest compared to that of the experimental group.

Table 4. Post-Test Result of Experiment Group (TJKT)

No	Name	Score
1	MZK	78
2	S	75
3	FNR	79
4	A	73
5	MAMY	79
6	BA	76
7	MI	77
8	MR	84
9	NB	81
10	TAP	79
11	NTMD	75
12	F	73
13	DQ	84
14	NR	79
15	NP	85
16	MUP	78
17	NKSW	79
18	RDN	83
19	M	85
20	A	81
	Mean	79.15
	Minimum	73
	Maximum	85
	Std deviation	3.73

The result shows that students' pronunciation ability in the experimental group increased significantly after being taught using the ELSA Speak application. The mean score improved from 47.60 in the pre-test to 79.15 in the post-test, showing a substantial improvement in pronunciation performance. This indicates that ELSA Speak effectively helped students improve their pronunciation accuracy through guided practice and immediate feedback.

To provide a clearer overview of students' pronunciation improvement, the summary of pre-test and post-test statistics is presented below.

Table 5. Pre-Test & Post-Test

Group	Test	N	Mean	Minimum	Maximum
Control	Pre-Test	20	47.75	40	55
Control	Post-Test	20	54.20	45	63
Experimental	Pre-Test	20	47.60	40	56
Experimental	Post-Test	20	79.15	73	85

The table shows that the control group's mean score increased by 6.45 points (from 47.75 to 54.20). In contrast, the experimental group's mean score increased by 31.55 points (from 47.60 to 79.15). This indicates that students who used ELSA Speak experienced greater improvement in pronunciation ability than students who learned through conventional methods.

Table 6. Pre-Test & Post-Test

Group	Sig (p-value)	N
Control Pre-Test	0.038	Not normal
Experimental Pre-Test	0.041	Not normal
Control Post-Test	0.031	Not normal
Experimental Post-Test	0.024	Not normal

Based on the normality test results, all p-values were lower than 0.05, indicating that the data were not normally distributed. Therefore, a non-parametric test was applied for inferential analysis.

Table 7. Mann-Whitney U Test Result

Statistical Test	Value
Mann-Whitney	0.000
Z-score	-5.43
p-value (Asymp.Sig. 2-tailed	0.000

The Mann–Whitney U Test showed a significance value of 0.000, which is lower than 0.05. Therefore, the null hypothesis (H_0) was rejected, and the alternative hypothesis (H_1) was accepted. This indicates that there was a statistically significant difference in pronunciation scores between the experimental and control groups after the treatment.

Effect Size Calculation

To determine the magnitude of the effect of the ELSA Speak application, the effect size (r) was calculated as follows:

$$r = \frac{Z}{\sqrt{N}}$$

Where:
Z = -5.43
N = 40

$$r = \frac{-5.43}{\sqrt{40}} = \frac{-5.43}{6.32} = -0.86$$

The effect size was r = 0.86, indicating a very large effect. This means that the ELSA Speak application had a strong, meaningful impact on students' pronunciation.

3.2. Discussion

The results of this study revealed that students in the experimental group demonstrated greater improvement in pronunciation than those in the control group after implementing the ELSA Speak application. Descriptive statistical analysis showed a substantial increase in the experimental group's post-test mean score compared to the pre-test results, whereas the control group experienced only a modest improvement following conventional pronunciation instruction. The experimental group improved from a pre-test

mean score of 47.60 to a post-test mean score of 79.15, indicating a significant gain after using ELSA Speak. In contrast, the control group showed a smaller increase from 47.75 in the pre-test to 54.20 in the post-test. Improvement in the experimental group was clearly reflected in students' phoneme articulation and word stress accuracy, as the application provided immediate corrective feedback and repeated practice opportunities. Furthermore, the Mann–Whitney U Test indicated a statistically significant difference in post-test scores between the experimental and control groups ($p < 0.05$), confirming that the observed improvement was not due to chance. These findings demonstrate that the ELSA Speak application was more effective in enhancing students' pronunciation ability than conventional teaching methods.

The findings of this study are consistent with previous research examining the use of mobile-assisted language learning (MALL) applications in pronunciation instruction [19], [20], [21], [22]. Studies have reported that pronunciation learning applications are effective in improving learners' pronunciation accuracy because they provide individualized feedback, allow learners to practice independently, and support repeated exposure to correct pronunciation models [9], [23], [24], [25]. Similar to the present study, technology-based pronunciation training helps students become more aware of their pronunciation errors and encourages them to self-correct through continuous practice. In this study, the significant improvement achieved by the experimental group supports the idea that digital learning tools such as ELSA Speak can function as an effective alternative resource for pronunciation learning, especially in EFL contexts where students often lack sufficient time and opportunities to practice speaking individually in the classroom.

During the implementation of ELSA Speak in this study, several challenges were also encountered. At the beginning of the treatment, some students had low confidence and hesitated to practice pronunciation, fearing mistakes or low scores on the application. In addition, several students initially struggled to adjust to the application's scoring system and feedback features, particularly in distinguishing phoneme sounds and applying correct word stress. Technical issues such as limited internet access and differences in students' smartphone performance also influenced the learning process, as not all students were equally familiar with using mobile applications for language learning. However, as the treatment progressed, students became more comfortable using the application, showed higher motivation, and practiced more actively. They gradually gained confidence, improved their pronunciation, and demonstrated better performance on the post-test.

These challenges are consistent with findings reported in previous studies on the integration of technology in language learning. Researchers have found that students may initially experience anxiety, low confidence, or difficulty adapting to new digital learning tools, especially when they are not accustomed to receiving automated feedback. However, with repeated practice and consistent guidance from the teacher, students can overcome these difficulties and benefit from the learning tool. The present study also suggests that the challenges associated with using ELSA Speak are temporary and can be minimized through proper classroom support, clear instructions, and continuous practice. Therefore, ELSA Speak can be considered a highly beneficial learning tool for improving students'

pronunciation, particularly for vocational high school students who need practical, flexible learning media to strengthen their English communication skills.

4. CONCLUSION

This study demonstrates that integrating the ELSA Speak application into pronunciation instruction positively improves students' English pronunciation at SMK Yadika Palu. Overall, the findings indicate that technology-assisted pronunciation learning can provide meaningful support for students in developing clearer and more accurate spoken English, particularly in vocational high school contexts where practical communication skills are essential.

From an educational perspective, the results of this study imply that Mobile-Assisted Language Learning (MALL), specifically through AI-based applications such as ELSA Speak, can serve as an effective complement to conventional pronunciation instruction. The application facilitates more intensive practice, individualized feedback, and increased learner engagement, which are often difficult to achieve in traditional classroom settings. Therefore, English teachers are encouraged to integrate mobile pronunciation applications into their teaching practices to enhance students' learning experiences and promote autonomous learning.

Despite these contributions, this study has several limitations that should be acknowledged. The research was conducted in a single vocational high school with a relatively small sample size and a limited treatment duration. In addition, the study focused only on two pronunciation components—phoneme articulation and word stress—without examining other important aspects such as intonation or connected speech. These boundaries may limit the generalizability of the findings to broader educational contexts.

Given these limitations, future research is recommended to involve larger, more diverse samples across different schools or regions, as well as longer intervention periods to examine the long-term effects of ELSA Speak. Further studies may also explore additional pronunciation features or investigate learners' perceptions and attitudes toward AI-based pronunciation tools in more depth. Beyond academic contributions, this research offers benefits to the general public by highlighting the potential of accessible mobile applications to support independent English learning, especially for students with limited exposure to English outside the classroom.

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