A Comparative Analysis of Pronunciation Proficiency among Arabic and English Department Students Using Accent Software

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Abstract: *One way to improve pronunciation skills is to use sophisticated technology, namely software that can help reduce accent errors. In this study we used ELSA Speak software which is an application (app) for moderating a non-native English accent. This study aims to determine whether accent reduction software can improve students' pronunciation abilities. It uses quantitative methods with an experimental research approach. The research was conducted at one of the Islamic universities in Indonesia. We recruited 40 students – 20 from the English department and 20 from the Arabic language department. Their ages are between 19 and 20, and they have been studying English and Arabic within their departments for four semesters. Ten students from each department were allocated to the experimental class, and ten other students from both majors were placed in the control class. The experimental class was taught by researchers using accent reduction software, while the control class was taught by an English teacher using conventional techniques. We used a voice recorder to capture students' pronunciation. The data were analysed using descriptive analysis and t-test. The results of the study show that the application of accent reduction software as a medium for teaching English pronunciation can improve students' skills in English pronunciation (t = 3.538, tcalculate> ttable). This software helps students produce English words clearly and easily because they can hear and imitate the sounds it generates. The implication of using the software can help students to imitate native speaker pronunciation and teachers can reduce their efforts in pronouncing native English sounds because the software functions as a pronunciation learning aid.*

Keywords: *Comparative; English pronunciation; accent software*

INTRODUCTION

English as a foreign language is taught at almost all universities in Indonesia, and is an important and prestigious language for students to find good jobs after graduating from university. However, since English is a foreign language, most students have difficulties in pronouncing English sounds, and this might hinder communication in a cross-cultural context. The problem might become worse when an Indonesian student communicates with a native speaker from English-speaking country. In this context, better pronunciation plays a very significant role in English communication (Fraser, 2000); it helps people to communicate clearly in English (Morley, 1991).

Having poor pronunciation can make it difficult for speakers to understand each other even if they have excellent grammar. Pronunciation is not only important in delivering clear ideas, but also in understanding ideas. Teaching English students proper pronunciation at an early stage helps them to avoid the risks of fossilisation and stabilisation of pronunciation habits (Fraser, 2001). In the Indonesian university curriculum, English is taught in all departments and study programmes, usually in the first and second semesters.

However, teaching of English in Indonesian universities is mostly concentrated on grammar and writing, while speaking is rarely taught. As such, when it is taught, most students experience difficulties in pronouncing English words. Such difficulties are aggravated when the teachers also have poor pronunciation skills. Pronunciation is usually taught by English teachers, and students have limited sources of learning pronunciation other than their English lecturers.

Previous studies have used software to help students to improve English pronunciation (Pourhosein Gilakjani & Rahimy, 2020; Seferoğlu, 2005). Computer software-assisted learning has been found more effective to implement in a language teaching class (Saleh & Gilakjani, 2021; Weng & Chiu, 2023). Similarly, the use of accent reduction software in teaching pronunciation is considered helpful in improving students' accuracy in pronouncing a sound in a target language (Zhang, Wang, Muthu, & Varatharaju, 2022). In this study we used ELSA Speak accent reduction software. The software can help learners to imitate native sound pronunciation of a word. Learners using it can practice their pronunciation freely at any time, 24 hours a day, seven days a week. Accent reduction software is also considered to improve learners' pronunciation (Cavus, 2016). At the same time, the software can help English teachers to create a better learning environment for their students where the pronunciation can be practised independently for an unlimited amount of time (Pi-hua, 2015).

However, limited studies have been conducted within an Islamic university context to understand how accent reduction software can be used to improve pronunciation skills of students from different departments. The objectives of this study, therefore, are to investigate how accent reduction software can improve university students' pronunciation skills, and how significant is the improvement of students' pronunciation skills after using the software . The contribution of this study is to provide academia and practitioners insight into the effectiveness of implementing accent reduction software in teaching English pronunciation. Practically, this study might provide guidance on the use of accent reduction software in a university English teaching classroom.

LITERATURE REVIEW

The Pronunciation

Pronunciation refers to the production of sounds that we use to create meaning (Levis & Wichmann, 2015). It includes attention to the particular sounds of language, and aspects of speech such as intonation, stress, timing and rhythm. In a broader definition, it includes attention to the way we speak a language. It is

also one way of communicating in order to deliver our thought orally in a more understandable way. Many experts have defined pronunciation in various ways, but all of the definitions have similar aims. Burns and Claire (2003) define pronunciation as the phonology of the language, or perception and production of sounds of a language and how they have an impact on the listener. Another definition of pronunciation is from Cakir (2011) who states that pronunciation is the key factor that native speakers notice during a conversation.

To sum up, based on the two definitions of pronunciation above, it can be concluded that there is no point in learning words without pronunciation because this can lead to a communication breakdown; pronunciation is the component of the language that deals with the way someone produces the sound.

The Importance of Pronunciation

It is often considered that learning pronunciation should be integrated with other language skills. The ultimate aim of learning pronunciation is to produce accurate target language sounds in order to exchange correct information between speakers and listeners (Korzekwa, 2022). Previous studies argue that English beginners should familiarise themselves with English pronunciation as early as possible (Burgess & Spencer, 2000). If learners do not practise pronunciation accurately as early as possible, their command of the correct pronunciation might develop late. They might be also build habits in pronouncing some sounds that do not reflect the sounds in the target language. In other words, a lack of proper pronunciation at the beginning stage of foreign language learning will potentially damage overall success and also lead to fossilised pronunciation.

A non-native speaker of English has to be very careful in pronouncing utterances or else he/she may create a misunderstanding between others with whom he/she communicates. Breitkreutz, Derwing and Rossiter (2001) argue that pronunciation is an important factor in communication. Poor pronunciation may cause misunderstanding and hinder communication in a target language. Richard and Schmidt (2010) explain pronunciation as the method of producing certain sounds of a language that act as symbols to support communication in that language. As such, pronunciation determines whether or not communication can run smoothly.

Some studies argue that learning pronunciation means that we need to acquire native-like pronunciation (e.g. Levis, 2005; O'Brien, 2004). These arguments might not be true, because other studies argue that the important thing is having intelligible pronunciation. For example, Gilakjani (2016) states that "the goal of pronunciation instruction is not to ask learners to pronounce like native speakers. Instead, the intelligible pronunciation should be the real purpose of oral communication." This means that intelligible pronunciation is more important than having native-like pronunciation. Hager (2001) argues that through pronunciation instruction, students not only learn different sounds but also improve their speaking skill. Concentrating on sound can make the learners more aware of where words should be stressed, giving them more information about spoken English. Therefore, teaching pronunciation develops English that is easy to understand and not confusing to the learners, meets the learners' needs, and

results in communicative competence, helping learners to feel comfortable in using English.

What is Accent Reduction Software

Accent reduction software is a software that can be used to help students to improve their English pronunciation (Seferoğlu, 2005). The software is used as a tool or as a medium to solve a pronunciation problem by students imitating sounds produced by the software. The software is available online or it can be downloaded and installed on a computer or mobile device. It combines texts, sound, and images to help students improve their English pronunciation. It also allows interaction between the users and the software. The advantages of the accent reduction software include providing learners with an independent learning mode, allowing them to work on their own with the learning materials at any time they want to study (Saleh & Gilakjani, 2021).

Saleh (2021) finds eight advantages in using accent reduction software in teaching pronunciation. These include providing students with experiential learning, increasing their learning motivation, enhancing student achievement, increasing authentic materials for study, emphasising students' needs, providing independence from a single source of information, and enlarging global understanding. In addition, the use of internet-based software in learning pronunciation can provide fun learning activities that increase students' happiness and reduce learning stresses and anxieties (Al-Fraihat, Joy, Masa'deh, & Sinclair, 2020; Gilakjani & Rahimy, 2019). Students can also use the accent reduction software independently at any time without being limited by the clock or geographical space. The software increases the accuracy of the students' pronunciation as they imitate recorded sounds from native speakers within the software (Kissling, 2013).

RESEARCH METHOD

This study employed quantitative methods with an experimental research approach (Taber, 2019) which allow researchers to measure the progress of students' pronunciation before and after the use of the accent reduction software (Chang, 2020). This study was conducted at an Islamic university in Indonesia. We recruited 40 students – 20 from the English department and 20 from the Arabic department. Ten more students from each department were allocated to the experimental class and another ten from the two departments were placed in a control class, totalling 20 mixed students in the experimental and control classes. The aim in mixing students from two different departments was to create a better teaching atmosphere and to discover more specific information about the effects on pronunciation of the different student backgrounds (Palfreyman & Al-Bataineh, 2018).

The experimental class was taught by researchers using the accent reduction software, while the control class was taught by an English teacher using conventional techniques as usual. In this study, we used Elsa, which is paid online software. The software produces the sound of English words pronounced by a native speaker and allows students to imitate the sound. Software keys were

distributed to all students in the experimental class, and Elsa was installed on laptops, tablets and smartphones to be used during treatment sessions. There were 12 of these, excluding pre- and post-test sessions. Similar durations of teaching were allocated to the control class, and both classes were pre- and post-tested before treatment. Students in the experimental class who received treatment (Alfu, Nurasmawati, Fitriningsih, & Nurdin, 2021; Nye, Hedges, & Konstantopoulos, 2000) were instructed to instal the accent reduction software on their smartphones or tablets. The pre-test and post-test results from both classes were compared and calculated to establish the study results.

We used a voice recorder to record the students pronouncing the words. We tested a number of words and sentences to avoid mistakes in scoring the students' performance. Both pre-test and post-test were used to measure students' abilities in pronunciation (Saleh & Gilakjani, 2021; Syafi'i, Nurdin, & Fitriningsih, 2020). Topics for the test were taken from the students' handbook, other related books, and the internet.

FINDINGS

Results of the Test

In collecting the data, there were two kinds of test used by the researcher, pre-test and post-test. Both experimental and control groups were given the tests. The researcher applied the pre-test before carrying out the treatment in order to find out the students' ability in pronunciation, especially coronal sounds. Meanwhile, the post-test was given after the treatment in order to assess the impact of accent reduction software applied during the treatment.

The test used in this research was pronouncing single words, with nine sounds used in the test: /θ/, /ð/, /t/, /z/, /ʃ/, /ʒ/, /tʃ/, /dʒ/, and /r/. Each sound occurs within three words, and the students scored one point if they could pronounce the words correctly. Therefore, the maximum score of this test was 27.

Pre-test

The researcher conducted the pre-test to measure students' ability in pronunciation before the experimental group was treated with a pronunciation medium – the accent reduction software – and the control class was treated with a conventional pronunciation method commonly applied in the school. The raw scores were obtained by counting how many correct pronunciations the students got. Meanwhile, the standard scores were obtained by dividing the students' scores by the maximum score, then multiplying by 100. The pre-test results of both groups can be seen in Tables 1 and 2 below.

Table 1. *The pre-test results for the experimental group*

| No | Student Initials | Department | Scores | |
			Raw Scores (0-30)	Standard (0-100)
1	AMH	English	18	60.0
2	RAS	English	11	36.7
3	ZAS	English	23	76.7

4	BUD	English	18	60.0
5	DAR	English	18	60.0
6	TAR	English	15	50.0
7	ESI	English	14	46.7
8	CSA	English	16	53.3
9	DPA	English	16	53.3
10	MDII	English	11	36.7
11	FDA	Arabic	17	56.7
12	GVE	Arabic	17	56.7
13	SAI	Arabic	16	53.3
14	KIP	Arabic	19	63.3
15	LAS	Arabic	17	56.7
16	MES	Arabic	18	60.0
17	MIM	Arabic	15	50.0
18	AKL	Arabic	16	53.3
19	WML	Arabic	15	50.0
20	GMR	Arabic	18	60.0
Total Score (EX₁)				**Σx= 1,593.6**

Based on Table 1, it can be seen that the highest pre-test score from the experimental group was 80.0 and the lowest was 36.7. Therefore, only two students passed the test. Most of the students' scores in this class were below the standard score of ≤ 75. This indicated that the students were having problems in pronouncing some English words and their ability needed to improve.

After calculating the pre-test score, the researcher then calculated the mean score of the students, applying the formula proposed by Arikunto. All of the standard scores were added then divided by the number of students. The mean computation can be seen as follows:

$$Mx = \frac{\Sigma x}{N}$$
$$Mx = \frac{1593.6}{30} =$$
$$M_{pre-test} = 53.12$$

By looking at the data above, we can see that the pre-test mean score for the experimental group was 53.12.

Furthermore, not only did the researcher analyse the pre-test results from the experimental group, but she also analysed the pre-test results from the control group. The students' individual scores from this pre-test can be seen on the table below.

Table 2. *The pre-test results from the control group*

No	Student Initials	Department	Scores	
			Raw Scores (0-30)	**Standard (0-100)**
1	AFI	English	10	33.3
2	ANO	English	7	23.3
3	BAK	English	17	56.7

4	AFU	English	17	56.7
5	BAS	English	7	23.3
6	CMF	English	22	73.3
7	DIR	English	17	56.7
8	EYA	English	13	43.3
9	NFK	English	13	43.3
10	YAG	English	18	60.0
11	HYG	Arabic	10	33.3
12	GSU	Arabic	18	60.0
13	IBS	Arabic	16	53.3
14	JSB	Arabic	16	53.3
15	KMU	Arabic	16	53.3
16	MPR	Arabic	13	43.3
17	MAI	Arabic	12	40.0
18	MSM	Arabic	18	60.0
19	MYU	Arabic	18	60.0
20	TLO	Arabic	18	60.0
	Total Score (EX₁)			**Σx= 1,479.8**

Table 2 shows that the highest control group pre-test score was 73.3, and the lowest was 23.3. Based on the data, none of the students in this class achieved the passing grade.

After obtaining the total score, the researcher calculated the mean score of the control group using the formula below:

$$M_y = \frac{\Sigma x}{N}$$
$$M_y = \frac{1479.8}{30}$$
$$M_{pre-test} = 49.33$$

This shows that the mean score for the pre-test in the control group was 49.33

Post-test

The researcher applied the accent reduction software at ten meetings with the experimental group, while the control group worked on conventional pronunciation methods commonly used by teachers in the school. The researchers then administered the post-test to the students of the experimental and control groups. The researcher conducted the post-tests among both groups on 1 and 5 March 2018. After analysing the post-test data, the researcher sets out the results of the post-test in both experimental and control groups in the tables below.

Table 3. *The post-test results from the experimental group*

No	Student Initials	Department	Scores	
			Raw Scores (0-30)	Standard (0-100)
1	AMH	English	25	83.3
2	RAS	English	27	90.0

No	Student Initials	Department	Raw Scores	Standard
3	ZAS	English	27	90.0
4	BUD	English	24	80.0
5	DAR	English	25	83.3
6	TAR	English	26	86.7
7	ESI	English	23	76.7
8	CSA	English	28	93.3
9	DPA	English	25	83.3
10	MDII	English	24	80.0
11	FDA	Arabic	25	83.3
12	GVE	Arabic	26	86.7
13	SAI	Arabic	27	90.0
14	KIP	Arabic	27	90.0
15	LAS	Arabic	25	83.3
16	MES	Arabic	21	70.0
17	MIM	Arabic	24	80.0
18	AKL	Arabic	25	83.3
19	WML	Arabic	26	86.7
20	GMR	Arabic	25	83.3
	Total Score (EX$_1$)			Σx= 2,563.2

Table 3 shows that 30 students from the experimental group took part in the post-test. The highest score was 100, and the lowest 70. Out of 30 students, only one could not pass the test. In other words, 29 of the 30 students improved their scores. Therefore, the accent reduction software can help students to improve their ability to pronounce coronal sounds.

The researcher continued by computing the mean post-test score of the experimental group, using the formula below:

$$M_y = \frac{\Sigma x}{N}$$
$$M_y = \frac{2563.2}{30}$$
$$M_{post-test} = 85.44$$

To sum up, by dividing the total score by the number of students in the experimental group, it was found that the mean score of the experimental group was 85.44. The researcher then analysed the students' scores in the control group after counting the post-test scores of the experimental group. The results can be seen on table 4.

Table 4. *The post-test results of the control group*

No	Student Initials	Department	Scores	
			Raw Scores (0-30)	Standard (0-100)
1	AFI	English	14	46.7
2	ANO	English	12	40.0
3	BAK	English	19	63.3
4	AFU	English	18	60.0
5	BAS	English	12	40.0
6	CMF	English	23	76.7
7	DIR	English	19	63.3

8	EYA	English	15	50.0
9	NFK	English	15	50.0
10	YAG	English	25	83.3
11	HYG	Arabic	14	46.7
12	GSU	Arabic	21	70.0
13	IBS	Arabic	18	60.0
14	JSB	Arabic	18	60.0
15	KMU	Arabic	19	63.3
16	MPR	Arabic	15	50.0
17	MAI	Arabic	16	53.3
18	MSM	Arabic	23	76.7
19	MYU	Arabic	20	66.7
20	TLO	Arabic	18	60.0
Total Score (EX₁)				**Σx= 1,773.4**

As Table 4 shows, the highest post-test score in the control group was 83.3, and the lowest 40.0. After finding out the students' total scores, the researcher calculated the mean post-test score using the formula below:

$$M_y = \frac{\Sigma x}{N}$$
$$M_y = \frac{1773.4}{30}$$
$$M_{post-test} = 59.11$$

The mean score of the control group was 59.11. Based on the data gained by the researcher, it is clear that the students' scores in the control group increased, but not as much as the experimental group.

It can be seen that the highest post-test score from the experimental group was 100 and the lowest was 70, while in the control group, the highest post-test score was 83.3 and the lowest was 40.0. Furthermore, the mean score of the experimental group was up to 85.44 from 53.12, and the control group increased to 59.11 from 49.33. Based on the mean scores of the two groups, the score of the experimental group increased by 32.32%, while the control group increased its score by 9.78%. Therefore, the results show that implementing accent reduction software improves pronunciation of coronal sounds among students of Arabic and English Tadris departments at IAIN Palu. The students' post-test scores in the experimental group prove this.

Deviation

Having calculated the mean score of the students for both pre-test and post-test, the researcher continued analysing the data by assessing the data of deviation and the square deviation of both experimental and control groups. The results are presented in the following table.

Table 5. *The results of score deviation in the experimental group*

No	Initials	Department	Scores		Deviation (Y) $X_2 - X_1$	Square Deviation (X^2)
			Pre-Test (X_1)	Post-Test (X_2)		
1	AMH	English	60.0	83.3	23.3	543
2	RAS	English	36.7	90.0	53.3	2,841
3	ZAS	English	76.7	90.0	13.3	177
4	BUD	English	60.0	80.0	20.0	400
5	DAR	English	60.0	83.3	23.3	543
6	TAR	English	50.0	86.7	36.7	1,347
7	ESI	English	46.7	76.7	30.0	900
8	CSA	English	53.3	93.3	40.0	1,600
9	DPA	English	53.3	83.3	30.0	900
10	MDII	English	36.7	80.0	43.3	1,875
11	FDA	Arabic	56.7	83.3	26.6	708
12	GVE	Arabic	56.7	86.7	30.0	900
13	SAI	Arabic	53.3	90.0	36.7	1,347
14	KIP	Arabic	63.3	90.0	26.7	713
15	LAS	Arabic	56.7	83.3	26.6	708
16	MES	Arabic	60.0	70.0	10.0	100
17	MIM	Arabic	50.0	80.0	30.0	900
18	AKL	Arabic	53.3	83.3	30.0	900
19	WML	Arabic	50.0	86.7	36.7	1,347
20	GMR	Arabic	60.0	83.3	23.3	543
	Total Scores				$\Sigma_x = 969.6$	$\Sigma x^2 = 34,702$

Table 6. *The result of score deviation for the control group*

No	Initials	Department	Scores		Deviation (Y) $X_2 - X_1$	Square Deviation (X^2)
			Pre-Test (X_1)	Post-Test (X_2)		
1	AFI	English	33.3	46.7	13.4	180
2	ANO	English	23.3	40.0	16.7	279
3	BAK	English	56.7	63.3	6.6	44
4	AFU	English	56.7	60.0	3.3	11
5	BAS	English	23.3	40.0	16.7	279
6	CMF	English	73.3	76.7	3.4	12
7	DIR	English	56.7	63.3	6.6	44
8	EYA	English	43.3	50.0	6.7	45
9	NFK	English	43.3	50.0	6.7	45
10	YAG	English	60.0	83.3	23.3	543
11	HYG	Arabic	33.3	46.7	13.4	180
12	GSU	Arabic	60.0	70.0	10	100
13	IBS	Arabic	53.3	60.0	6.7	45
14	JSB	Arabic	53.3	60.0	6.7	45
15	KMU	Arabic	53.3	63.3	10	100
16	MPR	Arabic	43.3	50.0	6.7	45
17	MAI	Arabic	40.0	53.3	13.3	178
18	MSM	Arabic	60.0	76.7	16.6	276
19	MYU	Arabic	60.0	66.7	6.7	45
20	TLO	Arabic	50.0	60.0	10	100
	Total Scores				$\Sigma_x = 300.1$	$\Sigma x^2 = 3,563$

In relation to Tables 5 and 46 above, the researcher computed the mean scores for deviation in the pre-tests and post-tests of both groups as follow:

$$Mx = \frac{\Sigma x}{N}$$
$$Mx = \frac{969.6}{30}$$
$$Mx = 32.32$$

$$Mx = \frac{\Sigma y}{N}$$
$$Mx = \frac{300.1}{30}$$
$$Mx = 10.03$$

After calculating the mean deviation of both groups' pre-test and post-test, it can be seen that the mean deviation of the experimental group was higher than that of the control group. The mean deviation of the experimental group was 32.2, while the mean deviation of the control group was 10.03.

Before analysing the data by using the t-test formula, the researcher counted the sum-squared deviation of the mean deviation of the mean score for both experimental and control groups as stated in the following ways:

$$\Sigma_x 2 = \Sigma_x 2 - \frac{(\Sigma_x)2}{N}$$
$$= 34702 - \frac{(969.6)^2}{30}$$
$$= 34702 - \frac{940124}{30}$$
$$= 34702 - 31337.5$$
$$= 3364.5$$

$$\Sigma_y 2 = \Sigma_y 2 - \frac{(\Sigma_y)2}{N}$$
$$= 3563 - \frac{(300.1)^2}{30}$$
$$= 3563 - \frac{90060}{30}$$
$$= 3563 - 3002$$
$$= 561$$

The result of the sum square deviation of the experimental group is 3364.5 and the sum square deviation of the control group was 561.

Moreover, the researcher computed the t-count to find out the significant difference between the experimental and control groups. The formula is as follow:

$$t = \frac{Mx - My}{\sqrt{\left(\frac{\Sigma x^2 + \Sigma y^2}{nx + ny - 2}\right)\left(\frac{1}{nx} + \frac{1}{ny}\right)}}$$

$$= \frac{32.32 - 10.03}{\sqrt{\left(\frac{34702 + 3563}{30 + 30 - 2}\right)\left(\frac{1}{30} + \frac{1}{30}\right)}}$$

$$= \frac{22.29}{\sqrt{\left(\frac{38265}{58}\right)\left(\frac{2}{30}\right)}}$$

$$= \frac{22.29}{\sqrt{(659.74)(0.06)}}$$

$$= \frac{22.29}{\sqrt{39.58}}$$

$$= \frac{22.29}{6.3}$$

$$= 3.538$$

Testing Hypothesis

For the testing hypothesis in this research, the researcher used two criteria proposing that the implementation of accent reduction software can improve the ability of grade eight students of Tadris in English and Arabic at IAIN Palu to pronounce coronal sounds. Firstly, the hypothesis is accepted if the t-counted is higher than the t-table. Secondly, if the t-counted is lower than the t-table, the hypothesis is rejected.

The researcher found that the t-counted is 3.538. To grasp the significant difference in the test, the researcher compared the value of the t-counted with the value of the t-table. The degree of freedom (df) of the table is $n_x + n_y - 2 = 30 + 30 - 2 = 58$ with an 0.05 level of significance; this cannot be found in the t-table, so the researcher had to calculate the t-table by using a formula as follows:

Degree of freedom: $\quad n_x + n_y - 2$
$$= 30 + 30 - 2$$
$$= 58 \text{ (Between 40 and 60)}$$
Level of significance $\quad = 0.05$
$$40 = 1.684$$
$$60 = 1.671$$
Where:
$$a = 58 - 40 = 18$$
$$b = 60 - 58 = 2$$
$$c = 1.684 - 1.671 = 0.013$$
The formula:
$$\frac{a}{b} \times c = \frac{18}{2} \times 0.013$$
$$= 0.117$$
$$Df\,(58) = 1.684 - 0.117$$
$$= 1.567$$

In order to make the formula clear, the researcher provides some explanation below.

a = The subtraction of the degree of freedom is obtained from the number of students in the sample, and the degree of freedom whose figure precedes right before the degree of freedom is obtained on the table of critical values of the students' distribution.

b = The subtraction of two degrees of freedom whose figure precedes and comes after the degree of freedom on the table of critical values of the students' distribution.

c = The values subtraction of the degree of freedom in b.

From the formula above, the researcher obtained that the value of t-counted was 3.538, and the value of t-table was 1.567. Thus, the result showed that the value of the t-counted is higher than the value of the t-table (3.538 > 1.567). This means that the hypothesis is accepted. Furthermore, there was a significant difference of achievement between the experimental and control groups. Altogether, the implementation of accent reduction software can improve

pronunciation among students in the Tadris Arabic and English departments at IAIN Palu.

DISCUSSION

The results of the post-test of the experimental class show that after 12 treatment sessions, the students' ability in pronouncing English sounds improved significantly. The significance of the pronunciation improvement can be seen in that the value of t-counted was 3.538, and the value of t-table was 1.567, so t-counted is higher than the value of the t-table (3.538 > 1.567). Meanwhile, the students' pronunciation ability in the control class remained unimproved. The results confirm that the use of accent reduction software in teaching English pronunciation can significantly improve students' pronunciation ability (Kılıçkaya, 2011). However, in our study the accent reduction software not only significantly improved English department students' pronunciation, but also improved that of Arabic department students. Our findings prove that the accent reduction software benefits all students from different departments in learning English pronunciation (Derwing & Munro, 2005; Pourhosein Gilakjani & Rahimy, 2020). This because the software supports students in imitating English sounds as produced by native speakers.

Our study also found that almost all students in the experimental class can pronounce English sounds properly, as demonstrated by the accent reduction software. Of course, the students did not produce sounds precisely like native speakers, but their pronunciation was clear and easy to understand. In other words, the students did not need to imitate the sound from the software precisely as pronounced by a native speaker, but they were required to produce clear and easily understood English sounds (Gilakjani, 2016; pronunciation, 2017). More importantly, the students can easily recognise the sound represented by an English symbol when they hear it from the software. As such, the teacher did not have to repeat the sound, as is usually practised in the absence of accent reduction software. Thus, using accent reduction software as a medium to teach English pronunciation can reduce the teacher burden in teaching English pronunciation. The software produced audio that can be heard and imitated by the students. Then the students practised pronouncing the words they heard from the software.

Finally, our study confirms previous studies that found that learners who had training periods on both accent-reduction and text-to-speech software showed more improvements in their English pronunciation (Pourhosein Gilakjani & Rahimy, 2020). The accent reduction software supports students from different departments (English and Arabic) in practising English pronunciation properly to make communication easy to understand. A study conducted by Gorjian, Hayati, and Pourkhoni (2013) confirms that the use of accent reduction software improves students' ability to pronounce words properly.

CONCLUSION

In conclusion, implementing accent reduction software as a medium to teach English pronunciation can improve skill in English pronunciation among students from different departments. All students from both departments showed significant improvement in their pronunciation skills and can properly imitate

English sounds as produced by the software. The software helps students to produce English words clearly and easily understood because sounds from the software resemble those of native speakers. The results of the data analysis indicate that students who learned English pronunciation using the accent reduction software got higher scores compared to the students who learned English pronunciation without the support of accent reduction software. Our study can help English teachers to understand the use of information technology in their English teaching to produce better results.

We acknowledge that our study has limitations. First, the experimental duration may not be long enough to justify our findings. Second, the comparison between two departments may be insufficient to show insight into the findings. However, our study has been carried out using scientific procedures, and all steps material to conducting experimental research have been fulfilled. We believe that our study can contribute to the body of knowledge in language teaching, and that the study also contributes to practice. English teachers might use our study, in particular in teaching English pronunciation using technology. Future studies might be conducted with longer experiment duration and more comparison language departments to produce more valid data and increase generalisability.

REFERENCES

Al-Fraihat, D., Joy, M., Masa'deh, R. e., & Sinclair, J. (2020). Evaluating E-learning systems success: An empirical study. *Computers in Human Behavior, 102,* 67-86. https://doi.org/10.1016/j.chb.2019.08.004

Breitkreutz, J., Derwing, T. M., & Rossiter, M. J. (2001). Pronunciation teaching practices in Canada. *TESL Canada Journal, 19*(1). https://doi.org/10.18806/tesl.v19i1.919

Burgess, J., & Spencer, S. (2000). Phonology and pronunciation in integrated language teaching and teacher education. *System, 28*(2), 191-215. https://doi.org/10.1016/S0346-251X(00)00007-5

Burns, A., & Claire, S. (2003). *Clearly speaking pronunciation in action for teachers.* Sydney: National Centre for English Language Teaching and Research Macquarie University.

Cakir, I. (2012). Promoting correct pronunciation through supported audio materials for efl learners. *Social and Educational Studies, 4*(3), 1801-1812. https://eric.ed.gov/?id=ED552800

Cavus, N. (2016). Development of an intellegent mobile application for teaching English pronunciation. *Procedia Computer Science, 102,* 365-369. https://doi.org/10.1016/j.procs.2016.09.413

Derwing, T. M., & Munro, M. J. (2005). Second language accent and pronunciation teaching: A research-based approach. *TESOL Quarterly, 39*(3), 379-397. https://doi.org/10.2307/3588486

Fraser, H. (2000). Literacy versus oral communication skills for ESL learners. *Literacy Link, 19* (3), 4-6. https://search.informit.org/doi/10.3316/aeipt.101631

Fraser, H. (2001). *Teaching pronunciation: A handbook for teachers and trainers.* Department of Education Training and Youth Affairs (DETYA).

Gilakjani, A. P. (2016). English Pronunciation Instruction: A Literature Review. *International Journal of Research in English Education, 1*(1). https://ijreeonline.com/article-1-21-en.html .

Gilakjani, A. P., & Rahimy, R. (2019). Factors influencing Iranian teachers' use of computer assisted pronunciation teaching (CAPT). *Education and Information Technologies, 24*(2), 1715-1740. https://doi.org/10.1007/s10639-018-09851-6

Gilakjani, A. P., & Rahimy, R. (2020). Using computer-assisted pronunciation teaching (CAPT) in English pronunciation instruction: A study on the impact and the teacher's role. *Education and Information Technologies, 25*(2), 1129-1159. https://doi.org/10.1007/s10639-019-10009-1

Habibah, A., Asmawati, N., Fitriningsih, & Nurdin. (2021). The effect of instagram in learning English vocabulary. *Datokarama English Education Journal, 2*(1), 23-34. https://deejournal.org/index.php/dee/article/view/26

Hager, A. (2001). *Focus on basics, connecting reserach & practice.* National Centre for the Study of Adult Learning and Literacy, 5(A).

Kissling, E. M. (2013). Teaching pronunciation: Is explicit phonetics instruction beneficial for FL learners? *The Modern Language Journal, 97*(3), 720-744. https://doi.org/10.1111/j.1540-4781.2013.12029.x

Kılıçkaya, F. (2011). Improving pronunciation via accent reduction and text-to-speech software. In M. Levy, F. Blin, C. B. Siskin, & O. Takeuchi (Eds.), WorldCALL: *International Perspectives on Computer-Assisted Language Learning* (pp. 85-96). New York: Routledge.

Levis, J. M. (2005). Changing contexts and shifting paradigms in pronunciation teaching. *TESOL Quarterly, 39(3*), 369-377. https://doi.org/10.2307/3588485

Levis, J. M., & Wichmann, A. (2015). *English intonation – Form and meaning* The Handbook of English Pronunciation (pp. 139-155). https://doi.org/10.1002/9781118346952.ch8

Morley, J. (1991). The pronunciation component in teaching English to speakers of other languages. *TESOL Quarterly, 25*(3), 481-520. https://doi.org/10.2307/3586981

Nye, B., Hedges, L. V., & Konstantopoulos, S. (2000). The effects of small classes on academic achievement: the results of the tennessee class size

experiment. *American Educational Research Journal, 37*(1), 123-151. https://doi.org/10.3102/00028312037001123

O'Brien, M. G. (2004). Pronunciation Matters. *Die Unterrichtspraxis/Teaching German, 37*(1), 1-9. https://doi.org/10.1111/j.1756-1221.2004.tb00068.x

Palfreyman, D. M., & Al-Bataineh, A. (2018). 'This is my life style, Arabic and English': students' attitudes to (trans)languaging in a bilingual university context. *Language Awareness, 27*(1-2), 79-95. https://doi.org/10.1080/09658416.2018.1431244

Pennington, M. C., & Richard, J. C. (1986). Pronunciation revisited. *TESOL Quarterly, 20*(2), 207-225. https://doi.org/10.2307/3586541

Pi-hua, T. (2015). Computer-assisted pronunciation learning in a collaborative context: A case study in Taiwan. *TOJET: The Turkish Online Journal of Educational Technology, 14*(4), 1-13. http://tojet.net/articles/v14i4/1441.pdf

Richards, J. C., & Schmidt, R. (2010). Language teaching and applied linguistics: pearson education limited. http://www.saint-david.net/uploads/1/0/4/3/10434103/linguistic_term_dictionary.pdf

Saleh, A. J., & Gilakjani, A. P. (2021). Investigating the impact of computer-assisted pronunciation teaching (CAPT) on improving intermediate EFL learners' pronunciation ability. *Education and Information Technologies, 26*(1), 489-515. https://doi.org/10.1007/s10639-020-10275-4

Seferoğlu, G. (2005). Improving students' pronunciation through accent reduction software. *British Journal of Educational Technology, 36*(2), 303-316. https://doi.org/10.1111/j.1467-8535.2005.00459.x

Simoes, A. R. M. (1996). *Assessing the contribution of instructional technology in the teaching of pronunciation.* Paper presented at the Proceeding of Fourth International Conference on Spoken Language Processing. ICSLP '96.

Syafi'i, M., Nurdin, N., & Fitriningsih, F. (2020). The effectiveness of know-want learned (kwl) strategy in improving reading comprehension of the eight grade students of SMP Negeri 14 Palu. *Datokarama English Education Journal, 1*(1), 53-50. https://doi.org/10.24239/dee.v1i1.5

Taber, K. S. (2019). Experimental research into teaching innovations: responding to methodological and ethical challenges. *Studies in Science Education, 55*(1), 69-119. https://doi.org/10.1080/03057267.2019.1658058

Weng, X., & Chiu, T. K. F. (2023). Instructional design and learning outcomes of intelligent computer assisted language learning: Systematic review in the field. *Computers and Education: Artificial Intelligence, 4,* 100117. https://doi.org/10.1016/j.caeai.2022.100117

Zhang, J., Wang, C., Muthu, A., & Varatharaju, V. M. (2022). Computer multimedia assisted language and literature teaching using Heuristic hidden Markov model and statistical language model. *Computers & Electrical Engineering, 98,* 107715. https://doi.org/10.1016/j.compeleceng.2022.107715