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The Implementation of Online Accent Reduction Software to Improve Pronunciation of English and Arabic Department Students

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ABSTRACT

The objective of this study is to implement accent reduction software in English pronunciation teaching. This study employed an experimental approach. There were forty students recruited from the English and Arabic departments. The students were split into two classes, with one class being treated as an experimental class and another class as a controlled class. Each class consisted of twenty students, ten English department students, and the other ten Arabic department students. We administered an experimental class with twelve meeting treatments using the Elsa accent reduction software to teach English pronunciation. Meanwhile, the controlled class was not given any treatments. The results show that there was a significant difference between the result of the pre-test and post-test of the students' pronunciations that were taught with the accent reduction software. It was found that the mean score of the experimental class was significantly improved from 53.12 to 85.44 after they were given the treatment. Meanwhile, the control group's mean score was also improved, but it was not significant from 49.33 to 59.11. Our study highlighted that the use of accent reduction software in teaching English pronunciations could help students to improve their English pronunciations. The students were able to imitate an English sound from the software. The limitation of this study is that we did not compare the results of English and Arabic students' ability in pronunciations after the use of the software. Future studies are recommended to compare pronunciations between English and Arabic students through the use of the software to understand language background might affect the treatment.

1. Introduction

English is a common subject taught to all university students in Indonesia, and it is considered an important foreign language that should be mastered. English has become a prestigious language for university students that should be mastered in order to find good jobs after graduating from a university. However, since English is a foreign language, most students have difficulties pronouncing an English sound, which might hinder communication in a cross-cultural context. The problem might worsen when Indonesian students communicate with a native speaker from an English-speaking country. In this context, better English pronunciation plays a very role in English context communication (Fraser, 2000). The pronunciation also helps people communicate clearly in English (Morley, 1991).

On the other hand, having poor pronunciation can make speakers difficult to understand each other even if they have excellent grammar. Pronunciation is not only important to deliver clear ideas but also to understand other ideas. Teaching proper pronunciation at the early stages of English students helps avoid the risks of fossilization and stabilization of pronunciation habits (Fraser, 2001). English is taught to all departments and study programs in an Indonesian university curriculum context. English is usually taught in the first and second semesters during university study.

However, the teachings of English in Indonesian universities are mostly concentrated on grammar and writing, while speaking is rarely taught. The English teachers usually teach the pronunciation, and the students have limited sources to learn pronunciation other than from their English lectures. As such, when speaking is taught, most students experience difficulties in pronouncing an English word. Such difficulties have deteriorated when the teachers also have poor pronunciation skills.

Previous studies have used software to help students improve English pronunciations (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). Similarly, the use of accent reduction software in teaching pronunciation can help students improve accuracy in pronouncing a sound in a target language. Learners can practice their pronunciation indecently at any time twenty-four hours a day and seven days a week. An accent reduction software improves 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 in an unlimited time independently (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 students' pronunciation skills from different departments. This study, therefore, was conducted to find out how accent reduction software can improve university students' pronunciation skills. The contribution of this study is to provide insight to academia and practitioners regarding the effectiveness of implementing an accent reduction software in teaching English pronunciation. Practically, this study might guide the use of accent reduction software in an English teaching classroom within a university context.

2. Literature Review

2.1 The Pronunciation

Pronunciation refers to producing sounds that we use to create meaning (Levis & Wichmann, 2015). It includes attention to the particular sounds of language and speech, such as intonation, stress, timing, and rhythm. In a broader definition, attention to the way we speak a language. It is also one way of communicating to deliver our thoughts orally more easily. Many experts have defined pronunciation in various ways, but then 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 impact the listener. Another pronunciation definition is from Cakir (2011), who stated that pronunciation is the key factor that native speakers notice during a conversation.

2.2 The Importance of Pronunciation

Learning pronunciation is often considered 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 the speakers and the listeners (Pennington & Richard, 1986). Previous studies argue that English beginners should familiarize themselves with English pronunciation earlier (Burgess & Spencer, 2000). If learners do not practice pronunciation as early as possible, their ability to practice the correct pronunciation might develop later. They might also be built habits in pronouncing some sounds that are not relevant to the sounds in the target languages. In other words, without proper pronunciation at the beginning stage of foreign language learning will potentially damage the overall success and also lead to fossilized pronunciation.

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

Some studies argue that learning pronunciation means having a native-like pronunciation (e.g. Levis, 2005; O'Brien, 2004). The arguments might not be true because other studies argue that the important thing is having an 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 an intelligible pronunciation is more important than having a native-like pronunciation. Another statement comes from Hager(2001), who argues that students learn different sounds and improve their speaking skills through pronunciation instruction. Concentrating on sound can make the learners more aware of where words should be stressed and give them more information about spoken English. Therefore, teaching pronunciation is to develop English that is easy to understand and not confusing to the learners, develop English that meets the learners' need and that results in communicative competence, and help learners feel comfortable in using English.

2.3 Accent Reduction Software

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

The works of Simoes (1996) found there are eight advantages of using accent reduction software in teaching pronunciations. The advantages are included providing students with experiential learning, increasing students' learning motivation, enhancing student achievement, increasing authentic materials for study, emphasizing students' needs, providing independence from a single source of information, and enlarging global understanding. In addition, the use of internet-based software in learning pronunciations can also provide fun learning activities that increase students' happiness and reduce learning stresses and anxieties (Al-Fraihat et al., 2020; Gilakjani & Rahimy, 2019). Students can also use the accent reduction software independently anytime without being limited by time and geographical space. The software increase the accuracy of the pronunciations produced by the students because they imitate sound from native speakers recorded in the software (Kissling, 2013).

3. Methodology

This study employed a quantitative method with an experimental research approach (Taber, 2019). This study was conducted in an Islamic university in Indonesia. We recruited forty students comprised of twenty students from the English department and 20 twenty students from the Arabic departments. Then ten students from each department were allocated for the experimental class, and another ten students from the two departments were placed in a control class. As such, there were twenty mixed students in experimental and control classes. The aim of mixing the students from two different departments was to create a better teaching atmosphere and discover more specifically about the pronunciations produced by the different students' backgrounds (Palfreyman & Al-Bataineh, 2018).

In this study, we used Elsa software which is a paid online software. The software keys were distributed to all students in the experimental class, and it was installed on laptops, tablets, and smartphones to be used during treatment sessions. The treatments were given for twelve meetings to the experimental class, excluding pre and post-test sessions. The researchers taught the experimental class using the accent reduction software, while the control class was taught by an English teacher using conventional techniques as usual. Similar lengths of teaching were also allocated to the control class. Both classes were given pre and post-test before the treatment was given. Students in the experimental class who received treatment (Alfu et al., 2021; Nye et al., 2000) were instructed to install accent reduction software on their smartphones or tablets. The pre-test and post-test results of both classes were compared and calculated to find the results of the study.

We used a voice recorder to record the students' pronunciations when they are pronouncing the words. We provided several words and sentences during the test 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 et al., 2020). The test topic was taken from the students' handbook, other related books, and the Internet.

4. Results and Discussion

4.1 Results of the Test

There were two types of tests given to the students. The tests were pre-test and post-test given to both students in experimental and control classes. The pre-test was given to determine the students' pronunciation abilities before the treatment was given. In the test, the students were asked to pronounce some single words. There were nine sounds used in the test, they were /θ/, /ð/, /t/, /z/, /ʃ/, /ʒ/, /tʃ/, /dʒ/, and /r/. Each sound consists of three words, and the students were scored 1 if they could pronounce the words correctly. Therefore, the maximum score of this test was 30. The pre-test results for the experimental class are presented in the following table 1.

Table 1. The result of the pre-test in the experimental group

No	Student Initials	Departments	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 (EX_1)		**Σx= 1593,6**	

Table 1 above shows that the highest score of the pre-test in the experimental class was 80.0, and the lowest score was 36.7. Most of the students' scores in the class were below the standard score of ≤75. The results indicated that the students were having problems pronouncing some English words, and their ability needs to be improved. After calculating the pre-test score, we then counted the mean score of the students. All of the standard scores were added then divided by the number of students. The mean computation is as follows:

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

Furthermore, we calculated the pre-test results of the control class, and the results are depicted in table 2 below.

Table 2. The result of the pre-test in the control class

No	Student Initials	Departments	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 (EX_1)		**Σx= 1479.8**	

Data from table 2 above shows that the highest score of control class students was 73.3, and the lowest score was 23.3. As such, the calculation for mean score is as follows:

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

Meanwhile, the post-test was given after the treatment was completed in order to know the impact of implementing Accent Reduction Software in teaching English pronunciation to the experimental class. However, the post-test was also given to the control class students to find out the students' pronunciation improvement after the control period was finished. The result of the experimental class post-test is presented in table 3 below.

Table 3. The result of the post-test in the experimental class

No	Student Initials	Departments	Scores	
			Raw Scores (0-30)	Standard (0-100)
1	AMH	English	25	83.3
2	RAS	English	27	90.0
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= 2563.2**	

Table 3 shows that the highest score was 100, and the lowest was 70. From 20 students, there was only one student who could not pass the test. In other words, 19 of 20 students' scores were significantly improved. The results proved that the use of accent reduction software in teaching pronunciation could improve the students' English pronunciation ability. The mean score was increased become 85.44. Meanwhile, the post-test results of the control class students are depicted in table 4 below.

Table 4. The result of the post-test in the control class

No	Student Initials	Departments	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 (EX_1)		**Σx= 1773.4**	

Data from table 4 above shows that the highest post-test score in the control class was 83.3, and the lowest score was 40.0. As such, the mean score of the control class students was 59.11. The post-test results showed that the student's score in the control group was increased, but it was significant. The results reflect that teaching pronunciation with conventional methods or without using accent reduction software did not improve the students' pronunciation abilities.

After the mean score of pre-test and post-test of both classes were calculated, we continued analyzing the data by finding out the data of deviation and the square deviation of both experimental and control classes. The results are presented in Tables 5 and 6 below.

Table 5. The result of score deviation of experimental class

No	Initials	Departments	Scores		Deviation (Y)	Square
			Pre-Test (X_1)	Post-Test (X_2)	$X_2 - X_1$	Deviation (X^2)
1	AMH	English	60.0	83.3	23.3	543
2	RAS	English	36.7	90.0	53.3	2841
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	1347
7	ESI	English	46.7	76.7	30.0	900
8	CSA	English	53.3	93.3	40.0	1600
9	DPA	English	53.3	83.3	30.0	900
10	MDII	English	36.7	80.0	43.3	1875
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	1347
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	1347
20	GMR	Arabic	60.0	83.3	23.3	543
	Total Scores				$\Sigma_x = 969.6$	$\Sigma x^2 = 34702$

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

No	Initials	Departments	Scores		Deviation (Y)	Square
			Pre-Test (X_1)	Post-Test (X_2)	$X_2 - X_1$	Deviation (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				$\Sigma_x = 300.1$	$\Sigma x^2 = 3563$

In the following steps, we computed the mean score of the deviation of pre-test and post-test of both groups as follow:

$$Mx = \frac{\Sigma x}{N} \qquad Mx = \frac{\Sigma y}{N}$$
$$Mx = \frac{969.6}{30} \qquad Mx = \frac{300.1}{30}$$
$$Mx = 32.32 \qquad Mx = 10.03$$

From the mean deviation of both groups' pre-test and post-test, it was found that the mean deviation of the experimental class was higher than the control group. The mean deviation of the experimental class was 32.2, while the mean deviation of the control class was 10.03. Before analyzing the data by using the t-test formula, we counted the sum-squared deviation of the mean score for both experimental and control groups as shown in the following formulas:

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

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

The result of the sum square deviation of the experimental group was 3364.5, and the sum square deviation of the control group was 561. Moreover, we computed the t-counted to find out the significant difference between the experimental and control groups, and the calculation is presented as follow:

$$t = \frac{Mx - My}{\sqrt{\left(\frac{\Sigma x^2 + \Sigma y^2}{nx + ny - 2}\right)\left(\frac{1}{nx} + \frac{1}{ny}\right)}}$$
$$= \frac{32.32 - 10.03}{\sqrt{\left(\frac{34702 + 3563}{30 + 30 - 2}\right)\left(\frac{1}{30} + \frac{1}{30}\right)}}$$

$$= \frac{22.29}{\sqrt{\left(\frac{38265}{58}\right)\left(\frac{2}{30}\right)}}$$
$$= \frac{22.29}{\sqrt{(659.74)(0.06)}}$$
$$= \frac{22.29}{\sqrt{39.58}}$$
$$= \frac{22.29}{6.3}$$
$$= 3.538$$

From the calculation above, it was found that the t-counted is 3.538. To know the significant difference of the test, we 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 a 0.05 level of significance cannot be found in the t-table. We calculated the t-table by using a formula as follows:

Degree of freedom :$n_x + n_y - 2$
$= 30 + 30 - 2$
$= 58$ (Between 40 -60)
Level of significance = 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

From the calculation above, we obtained that the value of the t-counted was 3.538, and the value of the 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). It means that there is a significant impact of using the accent reduction software to increase students' English pronunciation abilities. In other words, there was a significant difference in achievement between the experimental and control classes. Altogether, the implementation of Accent Reduction Software can improve pronunciation among students of Arabic and English departments students at the State Islamic University of Datokarama Palu.

5. Discussion

The post-test results of the experimental class show that after twelve times treatment were given, the student's ability in pronouncing English sounds improved significantly. In contrast, the students' pronunciation in the control class was not improved. 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 significantly improves English students in practising English pronunciation and non-English department students who learn English can significantly improve their English pronunciation. 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).

Our study also found that almost all students in the experimental class can pronounce English sound properly, as demonstrated by the accent reduction software. Of course, the students not precisely resemble 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 the students were required to produce English sound clear and easy to understand (Gilakjani, 2016; pronunciation, 2017). More importantly, the students can easily recognize the sound of an English symbol when they hear from the software. As such, the teacher did not have to repeat the sound as usually practised without using the accent reduction software. In addition, using the accent reduction software as a medium to teach English pronunciation can reduce the teacher's burden in teaching English pronunciation. The software produced audio that could 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 which found that learners who had training periods in both accent-reduction and text-to-speech software had more improvements in their English pronunciation (Pourhosein Gilakjani & Rahimy, 2020). The accent reduction software supports the students from different departments (English and Arabic) to practice English pronunciation properly to make communication easy to understand. A study conducted by Gorjian, Hayati, and Pourkhoni (2013) justifies that accent reduction software improves the students' ability to pronounce words properly.

6. Conclusion

In conclusion, implementing accent reduction software as a medium to teach English pronunciation can improve students' skills in English pronunciation from different departments. The software helps students produce English words clearly and easily understand because they can hear and imitate the sounds from the software. The result of the data analysis indicates that students who learned English pronunciation using the accent reduction software got higher scores than the students who learned English pronunciation without being supported by accent reduction software. Our study has a limitation in which we did not compare the students' pronunciation ability from the Arabic and English departments after the treatment. Further studies might need to study how the accent reduction software can improve students' pronunciation from different field studies backgrounds.

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