

CHAPTER I

INTRODUCTION

1.1 Background of the Study

English is considered a foreign language in Indonesia, and it is taught at all levels of education, from elementary school to university, and it is one of the reasons why students struggle to acquire their listening skills. Because English is not their native language, they are not accustomed to the English language, including word pronunciation and hearing people speak English. There are four skills that English Foreign Language (EFL) students must learn when studying English. The four skills are reading, listening, writing and speaking, these four skills must be mastered for better understanding in English, according to Morteza Bagheri (2023:02), listening is the most important source for conveying understandable information to students. It is also a helpful resource for teaching new forms and various elements of the language such as grammar and vocabulary. The students had difficulty acquiring English, particularly in the area of listening, it is possible that the difficulty stems from the fact that most students regard English topics as a blight or as difficult and uninteresting. Students despise, are lazy, and wish to avoid it since it is difficult and unappealing.

In fact, students face numerous challenges in improving their listening skills; generally, they find it difficult to understand English phrases or sentences, sentence complexity, unfamiliar pronunciation, and do not know the meaning of English words that are spoken or heard due to their limited English vocabulary; thus, vocabulary has an important role in language learning, particularly in second

language acquisition, especially in building reading, writing, speaking, and listening the problems above have similarity with the problems that the writer found in SMP Negeri 37 Medan. Thus, vocabulary mastery is an important basis in measuring language proficiency in mastering foreign languages. Most of the students encounter the problem of poor recording quality, complained most of them speak too fast, which makes it difficult for them to understand. Because there are still many students with hearing difficulties, and listening skill is important in everyday communication especially in learning English, it is become interesting to the researcher to do an analyzing of students' listening difficulties. There are numerous methods or ways that can be used in our learning activities to improve our listening skills in English. This may take the form of listening to more English songs, podcasts, or watching foreign movies with English or Indonesian subtitles, or it can take the form of using several applications on our smartphones that offer functions to improve the four existing English skills, not only listening but also reading, writing, and speaking in English. Busuu is one of the applications that could be used to improve listening skills.

Among a large variety of online foreign language learning websites and mobile applications, Busuu offers language learning classes in 12 languages, including English, Spanish, French, and German. Over 100 million individuals use this service worldwide. Language classes are divided into four levels: (1) beginner; (2) elementary; (3) low intermediate; and (4) upper intermediate. Advanced learners are not targeted in Busuu online language learning courses. This application is available and downloadable for smartphones operating Android and iOS platforms; students and teachers should be able to utilize it while

studying English as a result of this application. For persons who do not have much spare time to learn the language through face-to-face lessons, Busuu application can be a very simple alternative (Albantani, 2018:04). Learning English with the Busuu application is enjoyable because the application offers a wide range of themes from which users can choose.

Busuu offers a variety of entertaining quizzes to learn, in addition to the different themes given. Illustrations, movies, other types of learning information, and tasks are also included. Their lessons attempt to help students with more than just these four language abilities; they also work on vocabulary, grammar, and pronunciation. Busuu offers online language learning courses based on the Common European Framework of Reference for Languages (CEFR), one of the most widely used standards for determining language proficiency worldwide. There are four CEFR levels accessible for these courses: A1 (Beginner), A2 (Elementary), B1 (Intermediate), and B2 (Upper-Intermediate).

1.2 Problem of the study

Based on the background above, the formulation of this research is:

“Does Busuu application effectively used as a medium for students’ listening skill of eight grade students at SMP Negeri 37 Medan?”

1.3 The Objective of the Study

Related to the problem formulation above, the objective of this research is to find out whether or not Busuu application can be effectively used as a medium for students’ listening skill of eight grade students at SMP Negeri 37 Medan.

1.4 The Scope of the Study

This research focuses on the effectiveness of Busuu application on the listening skill of eight grade students at SMP Negeri 37 Medan. This study uses experimental quantitative research design. It is investigated whether or not the Busuu application can be effectively used as a medium for the listening skills of eight grade students at SMP Negeri 37 Medan.

1.5 The Significances of the Study

By doing this research there is much benefit that can be reached. Hopefully this research can be positive contribution for general or educational field. The significance of the study is theoretically and practically.

1.5.1 Theoretical Significances

The results of this study are expected to support the theory of using social media applications for learning, especially Busuu, and can be used as one of the effective tools for helping students learning general English. Aside from it, students generate positive response when using Busuu for learning process. It is expected to provide information for English teachers, especially for encouraging students to read texts more efficiently. It is also expected to increase students' awareness of identifying specific information in various types of listening learning.

1.5.2 Practical Significances

1. For the teacher

This research is expected to help teachers finding alternative media for listening lessons to enhance the learning process.

2. For students

This research is expected to be a solution to help students improving their listening skills.

3. For further researcher

This study will hopefully serve as a model for other researchers who want to conduct similar research at a different level or perspective.

1.6. The Hypothesis of the Study

The hypothesis of this research is:

H_{a} : The Busuu application can be effectively used as a medium for students' listening skill of eight grade students at SMP Negeri 37 Medan.

H_{0} : The Busuu application cannot be effectively used as a medium for students' listening skill of eight grade students at SMP Negeri 37 Medan.

CHAPTER II

REVIEW OF LITERATURE

2.1 Concept of Listening

2.1.1 Definition of listening

In the context of English as a Second Language (ESL)/ English as Foreign Language (EFL), listening has long been recognized as a challenging skill for teachers, students, and researchers working with, it is a complex process that requires an active role on the part of the listener in interpreting the message. They should have different knowledge such as prosody, culture, vocabulary, and structure of the English language (Nushi & Orouji, 2020:03). In line with Nushi & Orouji, Rakhman et al. (2019:02) states that listening is a complicated process as people involved in listening need to have a good understanding of the cultural context. The language scene, which can enhance successful listening, is also in demand. Examination of listening comprehension in second language learning focuses on the role of the individual language units (e.g., phonemes, words, grammatical structures) and the role of listener expectations, situation and context background knowledge, and themes. According to the explanation above, listening is active, purposeful processing to understand what we hear. Listening comprehension is the process of understanding speech in a first or second language. The first skill humans acquire is the ability to listen it is an essential component of speaking. Listening implies paying attention to what others say and listening is more than just hearing sounds “from right ear to left ear” or vice versa, it is one of the skills required of a master. Understanding what others are saying is

a serious effort that cannot be accomplished solely through habit, reflex, or instinct.

Teacher could develop with effective strategies to improve students' skills in some ways, if they understand their attitudes and the difficulties they confront in gaining English language skills (Alzamil 2021:07). Therefore students' attitudes play an important role in learning English. No matter how we engage in listening, it is important to understand that listening is more than just hearing what is said to us. Listening is the active process of understanding, evaluating and responding to what we hear. Active listening is a specific communication skill in which the listener has to give back in their own words to the speaker what they have heard by paraphrasing what they have heard. The purpose of this repetition is to confirm what the listener heard and to ensure mutual understanding. Active listening is most often used to improve relationships, reduce misunderstandings and conflicts, increase collaboration, and encourage understanding.

According to the explanation above, it can be concluded that listening is more than just hearing what is being said; it is an active process of interpreting, evaluating, and responding to what is heard. Active listening, involving paraphrasing what is heard to affirm mutual understanding, is a specific communication skill that can improve relationships, reduce misunderstandings and conflicts, and increase collaboration and understanding. To summarize, listening is a complex and active process in language learning that necessitates knowledge of various aspects of the language and an understanding of the cultural context. Teachers can play an important role in developing effective strategies to improve students' listening skill by taking their attitudes and problems into

consideration. Active listening is an important communication skill that can help to build relationships and foster understanding.

2.1.2 Process of Listening

Listening is considered a part of a transaction process in which all participants simultaneously “send” and “receive” a message. This means that listening is a process involving something or someone in receiving and sending messages. Listening has 5 processes: (1) receiving, (2) understanding, (3) remembering, (4) evaluating, and (5) responding (Siahaan M, 2020:23).

1. Receiving

The first stage of the listening process is receiving. Hearing is the physiological process of recording sound waves that hit the eardrum. It may seem obvious, but to effectively gather information through listening, you first have to be able to physically hear what is being heard. Hearing impairment impairs the ability to hear. Excessive ambient noise can affect reception of audible sound waves.

2. Understanding

We try to figure out what the message means during the understanding stage, which is not always straightforward. On the other hand, when the speaker is not speaking clearly, it is difficult to discern information. This stage helps in comprehending the symbols we perceive. Symbolic stimuli include not only words but also sights like applause and blue uniforms. Despite their symbolic significance, the meaning associated with these symbols is a function of our past associations and the context in which the symbols appear.

3. Remembering

The remembering stage occurs during the listening process, in which the listener categorizes the information gathered from the speaker and stores it for future reference. When a listener pays attention, understands, and evaluates something, the result is likely to be kept in memory, allowing the listener to record information about people, objects, and events for later retrieval. This happens both during and after the delivery of the speakers.

4. Evaluating

The listener analyses the information obtained both qualitatively and quantitatively during this stage of the listening process in order to evaluate or judge the value of the information. "That makes sense," we might think, or "That is weird." Because each includes prejudices and viewpoints acquired from vastly varied life experiences, the evaluations of the same message by different audiences will range significantly.

5. Responding

You declare your commitment throughout the responding stage. During this stage, almost anything you do can be regarded as feedback. The recipient must finish the process through verbal and nonverbal feedback throughout this phase. Because the speaker has no other way of knowing whether the message was heard, this is the only open way for the sender to know.

2.1.3 Difficulties of Listening

Listening is a difficult skill to learn when learning a second language. The difficulty caused by a number of factors, starting with sound differences between the student's first and second languages they learning, their lack of vocabulary, and their lack of grammatical knowledge, as well as pragmatic differences between the two languages, (Nushi & Orouji, 2020:03) add anxiety, stress, loss or lack of confidence also the factors, that interfered with the listening comprehension process. Students often have difficulty developing their listening skill, there are some problems students faced in listening. There were some problems faced by the students such as: lack of vocabulary, lack of understanding structure, inability to understand natural language, loss of self-confidence, maintaining concentration, poor recording quality. Most students had problems with poor recording quality, most complained about the narrator too fast, which makes it difficult to understand (Nuriah, 2021:01). Also about the difficulty in distinguishing sounds, students may not be able to distinguish different sounds in English, for example words like —bedl, —badl, and —batl. They cannot interpret the sound accurately as a result. Second, the difficulty lies in drawing conclusions from the listening text. Students do not realize that listening is not good enough because listening requires them to think about what they are hearing.

2.1.4 Teaching Listening Activities

The ability to listen is believed to be crucial to the language learning process. (Alzamil, 2021:08) states, it is really important for students of English to listen to the language as it is spoken, not just in the classroom but also at home, to improve their listening skills effectively and overcome these problems. Teaching listening activities are carried out through systematic procedures and techniques. Therefore, teachers must prepare their classes for such activities and use optimal means to teach listening exercises based on the latest and most appropriate approaches and methods in the field of language teaching (Al-Janaydeh & Deif, 2021:02). This means that by listening to some kind of tape material, one tries to understand and possibly interpret the meaning of the material presented. In the classroom, teachers are the key to improving the learning atmosphere for students.

Listening activities are typically divided into three categories: pre-listening, while-listening, and post-listening.

1. Pre-listening activity

Pre-listening activities are activities that students do before listening to prepare to listen. These activities have a variety of purposes including introducing the teacher to a topic, providing context, discussing a topic, questions on this topic explaining difficult vocabulary will help teachers understand its meaning.

2. While-listening activity

While listening activity is a phase that teachers often use in the classroom and its purpose is to help the students develop hearing skills. This is an activity in which students come into contact with a recorded or written text. At the moment, learning and listening activities are: The teacher explains the lesson/instruction and if the student follows the topic, the teacher asks the student to take notes while listening, and the teacher reviews the speech.

3. Post-listening activity

Post-listening activity help students check their understanding after completing the lesson-plan and see how students followed the teacher.

In summary, pre-listening, while-listening, and post-listening activities are important for language learners to improve their listening skills. Teachers can use different types of activities to make language learning more engaging and effective. By including different sub-categories of listening exercises, students can improve their listening skills, pronunciation and vocabulary.

2.2 English Learning Application

Improving your English skills is actually not a difficult thing. We just have to learn regularly and constantly. There are many effective and modern ways to improve your English such as English movies, songs, games, applications, social media and more. Technology has evolved and has developed many useful tools for the world of education, especially for learning for learning English. Everything is possible through the internet in this digital age, as it cannot be denied that today the internet is very much related to human needs, Tika et al. (2021:01). From the Google Play Store (free or paid and online or offline) users can download many language learning applications, include online dictionaries, translating application and even language courses. The learning process can be supported by the functions and apps provided in the smartphones. These functions and apps can carry out the learning process not only as usual in the classroom, but also outside of the classroom and also in free time not only as usual during school hours.

All in all, English learning applications are a great way to improve your English for personal, academic, and professional purposes. They provide access to a variety of English resources, including listening and reading materials, grammar and vocabulary practice, and speaking practice. English learning applications allow you to improve your language skills at your own pace and on your own schedule. Here is a list of some of the best English learning applications:

Duolingo;
Rosetta Stone;
Babbel;
Busuu;
Memrise;
HelloTalk;
FluentU;
BBC Learning English, etc.

2.3 Busuu Application

Busuu is a language learning application developed by native speakers of each language. This application is more like a social media, so materials can be chosen from the simplest to the advanced level. The topics are also free to be chosen to learn such as vocabulary, speaking, listening, reading and writing while playing. This application is suitable for beginners, including children. Busuu offers courses in languages such as English, Spanish, German, French, Italian, Portuguese and Russian. With captivating pictures, basic verbs, phrases, expressions and more can be learnt here. There are also quizzes to test your skills. In addition, this application also provides a dictionary and grammar to help you learn foreign languages. The Busuu application also includes interactive and social features. All the materials can be studied here, which are constantly updated through an attractive and interactive exhibition. You can also interact with other users to practice foreign languages directly. The purpose of using the app is also questioned when users register. There are several options, e.g. Learning English for pleasure and culture, education, transport, travel or friends and family. The

algorithm allows Busuu to prepare the best course according to users' needs (Meniwati & Mutiaraningrum, 2022:03).

Teachers need to do to use media effectively is:

1. Search, find, and select media that meet student learning needs;
2. Arouse the interest of the students;
3. According to the development of the age and experience of the students and the specificity of the study group.

These characteristics include student maturity and experience, as well as the development of age-related mental disorders. In addition to the issue of students' media interest, the message presentation of what the teacher is saying also needs to be considered multimedia selection. There are at least three functions that develop together in media life:

1. The stimulus function that arouses interest in learning and knowing more about anything in the media;
2. The mediating function of acting as an intermediary between teachers and students. In this case, the media acts as a bridge between teachers and students;
3. The information functions indicate the explanation that the teacher wants to convey. Through existential media, students can grasp the information or explanation that they need or that the teacher wants to explain.

Features in the Busuu application:

1. New Learning Path: Busuu has introduced a new learning path to help users achieve their learning goals faster;
2. New engaging course content: The application features new engaging course content including video flashcards;
3. More gamifications and Fun: To motivate users, Busuu introduced streaks, points, leaderboards and other gamification features;
4. Free access to the entire course: Users have free access to the entire course. Busuu provides a personalized learning schedule for users to study on their own pace;
5. Feedback from native speakers: Users can get feedback from native speakers to improve their language skills;
6. Vocabulary Builder: Busuu provides a vocabulary trainer to help users learn and remember new words;
7. Speaking and Writing Practices: The application provides exercises to help users improve their speaking and writing skills;
8. Community: Users can join a community of language learners around the world.

From the description above, it can be concluded that Busuu can be used as an effective educational medium. It is because this application primarily addresses the learning needs of students. Second, the application is very popular among students because they are new and feature-rich. Third, Busuu can be distributed for learning and last but not least this application that corresponds to the development of maturity and experience characteristics of millennial students who are digitally accustomed and particularly mobile phone users.

2.4 Previous related Study

In order to conduct this research, some studies from other researcher, are read and learnt to enhance students listening through some application and related studies.

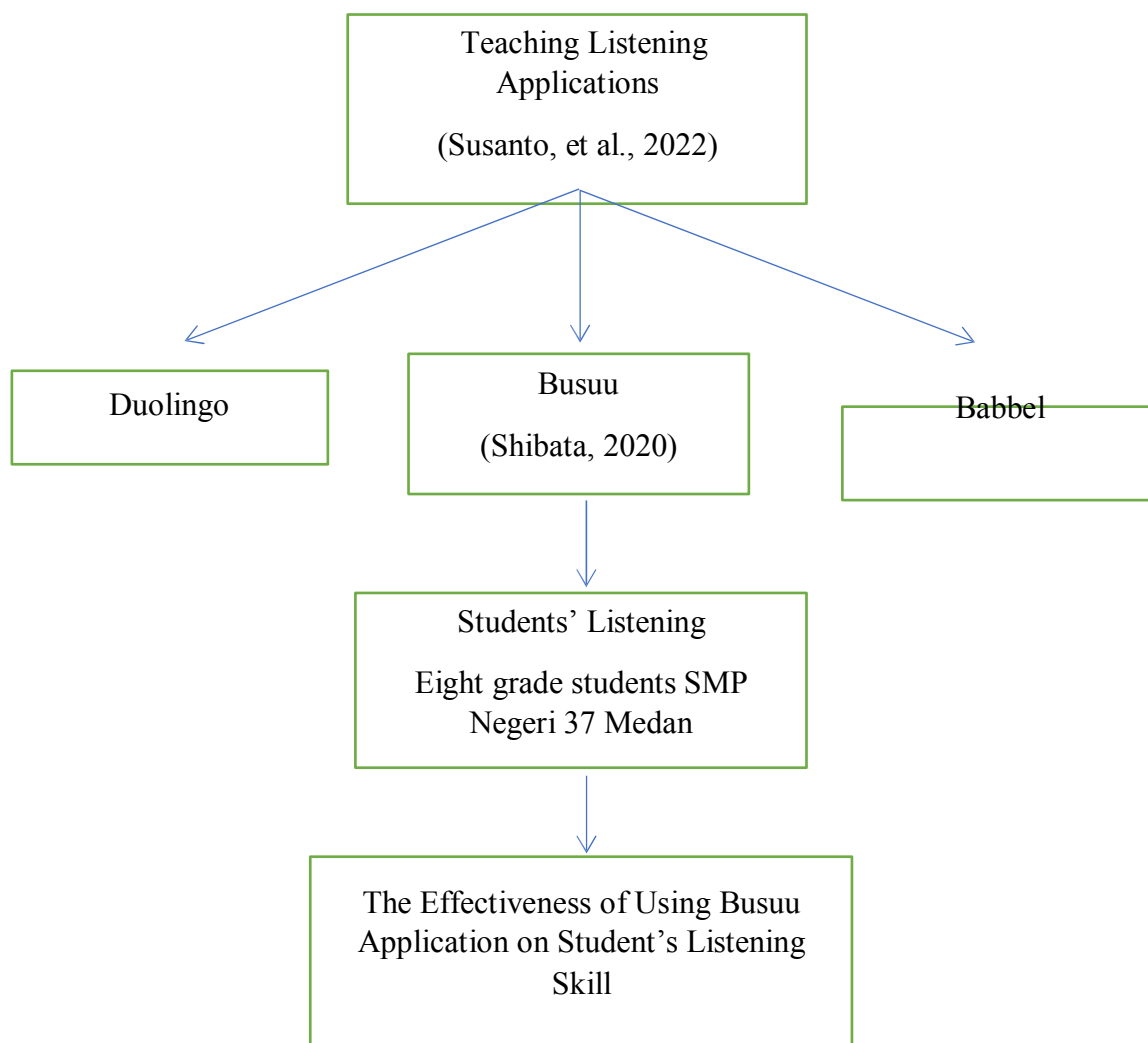
The first previous study of the research conducted by Ade, M and Mesa, M (2021) entitled “*The Effectiveness of Using “Busuu” in Teaching Speaking*”. The aim of this study is to determine the effectiveness of the Busuu application on the speaking skills of the students tested in Class X of SMK Darulullum Kuningan in the 2020/2021 school year, the researcher used a pre-experimental study used in Class X. The study was conducted in three meetings designed as follows: The first meeting for pre-test, the second meeting for the treatment and the final for the post-test. As a quantitative method, data analysis was performed using a simple paired t-test. The results showed clear differences between the students who learned to use the Busuu application as a medium. The average student score for pre-test was 61,875 while the average class score for post-test was 73,750 speak.

Based on the results of research analysis, probability $0.000 < 0.05$. So, conclusions were drawn based on the examination of scores from the pre-test and post-test, which showed that after treatment there was a significant difference in improving the speaking skills of tenth graders at SMK Darulullum Kuningan.

The second study was conducted by Hernita Samara (2021) entitled *“The Use of Busuu Application to Enhance Students’ Listening Skill At Smp Negeri 2 Galesong Selatan Takalar”*, the aim of this research is to find out if the Busuu application improving Students' Listening Skills at SMP Negeri 2 Galesong Selatan Takalar. This study used a pre-experimental designed as a pre-test and post-test group. The author conducted a pre-listening test before the students used the Busuu application. The post test is conducted after the students have used the Busuu application in listening. The sample of this research was SMP Negeri 2 Galesong Selatan Takalar Class VIII-E consisting of 22 students. The result of listening skill test of the students’ score after Busuu application was higher than before. In short, the average score on the pre-test is 60.77 and the average final score of post-test is 83.54. The result of this research will be used by writer as a model and references to conduct this research.

Third study was conducted by Arumsari, and Saly Kurnia Octaviani (2022) entitled “*Duolingo Mobile Application for English Listening Skill Improvement of Vocational School Students*”. The aim of this study was to find out the progress of 11th grade students in English listening comprehension at SMK Analisis Kesehatan Nasional Surakarta using Duolingo and the students' opinions on the mobile application. This study used quantitative research with a pre-experimental design to analyze the data. During this period, pre-test, post-test, and final questionnaires were used for data collection. The results show that student scores before and after the test is significant improvement in English listening skills of students with a score of 73.25 and an average pre-test score of 83.3 average student ratings after the test and 90% positive student attitude towards using Duolingo mobile application to learn English.

2.5 Conceptual Framework



Based on the scheme above, it can be seen that this research is on the field of teaching listening application. Generally there are three types of applications that can be adopted in order to teach listening, that is: 1) Duolingo; 2) Busuu; and 3) Babbel. In this research, Busuu is chosen to be a medium for student's listening skill of eight grade students at SMP Negeri 37 Medan. By conducting this research it will show whether or not the Busuu application is effective on the students' listening skill.

CHAPTER III RESEARCH

METHODOLOGY

3.1 Research Design

Research design in this study was an experimental quantitative research design. According to Sugiyono (2016:72), experimental research can be used to fine the effect of certain treatments on others under controlled conditions. The writer will also conduct pre-test and post-test assessments as part of this study to determine the effectiveness of the treatment. One group pre-test and post-test was applied in this research. In this design, a pre-test was performed prior to administering the treatment. The researcher chose this study because the researcher want to examine reliable findings from multiple tests, namely with the pre-test (before treatment) and post-test (after treatment).

Table 3.1 The Design of the Study

Pre-test	Treatment	Post-test

3.2 Population and Sample

A population is a complete group of individuals with specific characteristics, and a sample is a subset of a population. Based on the definition above, the population of this research was the eighth grade students at SMP Negeri 37 Medan.

A sample is a specific group from which data is collected. The sample size is always smaller than the total population size. The research was done in one class that consists of 29 students.

3.3 The Instrument of Data Collection

A listening test was used as the instrument of the study for mobile phone, Busuu application, speaker, and answer sheet.

3.4 The Technique of Collecting Data

There are some steps in collecting the data for this research. The test was used in the data collection technique. The test is going to use to measure the competence of each students and to achieve the objective. The content of the test will be filled in the blank test. The test will contain of 20 questions and it will apply to pre-test and post-test with different content. The students are given 40 minutes to finish the pre-test and post-test.

3.4.1 The Procedure of Collecting Data

The following research test employed in the data gathering technique, the test consists of pre-test, treatment, and post-test.

1. Pre-test

The pre-test is a test given to students before the subject is taught. A pre-test was administered to measured students' listening skill prior to treatment in order to identify the difference in scores before and after treatment.

Table 3.2 The Activities During Pre-Test

No.	Teacher Activities	Students Activities
1.	The researcher comes to class and greets the students	The students responses to the researcher
2.	The researcher introduces herself to the students	The students listen and pay attention to researchers
3.	The researcher explains to the students the aim of her come to the class	The students listen and pay attention to researchers'
4.	The researcher asks the students to do the pre-test	The students do the pre-test

2. Treatment

The treatment was used by conducted Busuu application. The researcher was applied Busuu application as the medium in learning English.

Table 3.3 The Activities During Treatment

No.	Teacher Activities	Students Activities
1.	The researcher greets the students	The students responses to the researcher
2.	The researcher introduces the material about listening skill.	The students listen and pay attention to researchers' explanation.
3.	The researcher introduces Busuu application	The students listen and pay attention to researchers' explanation.
4.	The researcher asks the students to download and install the Busuu application on their phone	The students download and install the Busuu application on their phone.
5.	The researcher explains how to use the Busuu application	The students listen and pay attention to researchers' explanation
6.	The researcher asks the students learn English by using Busuu application and did the task in the Busuu application	The students learn English by using Busuu application and did the task in the Busuu application.

3. Post-test

All students were given a post-test to determine their improvement in English listening skills. This act implemented in order to assess students' improvement in English listening skill after the treatment.

Table 3.4 Activities During Post-Test

No	Teacher Activities	Students Activities
1.	The researcher greets the students	The students responses to the researcher
2.	The researcher gives the introduction statement and the post-test	The students listen and pay attention to researcher
3.	The researcher explains about the rule of the post-test	The students listen and pay attention to researchers' explanation
4.	The researcher asks them to do the post-test	The students do the post-test

3.5 Scoring of the Test

Criteria	Component in Scoring Test	Score
Distinguishing phonemes	Can distinguish phonemes very well and accurately.	1
	Can distinguish phonemes quite well and accurately.	2
	Can distinguish phonemes quite well and accurately.	3
	Cannot differentiate phonemes.	4
Identifying stress and intonation	Can identify stress and intonation very well and accurately.	1
	Can identify stress and intonation well and accurately.	2
	Can identify stress and intonation quite well and accurately.	3
	Unable to identify stress and intonation.	4
Identify the meaning of words, sentences and utterances	Can identify the meaning of words, sentences and utterances very well and accurately.	1
	Can identify the meaning of words, sentences and utterances quite well and accurately.	2
	Can identify meanings, sentences and utterances quite well and accurately.	3
	Cannot identify meaning, sentences and utterances.	4
Responding to utterances in interpersonal or transactional discourse	Can respond to utterances in interpersonal or transactional discourse very well and accurately.	1
	Can respond to utterances in interpersonal or transactional discourse well and	2

	accurately. Can respond to utterances in interpersonal or transactional discourse quite well and accurately. Unable to respond to utterances in interpersonal or transactional discourse.	3 4
Identifying the meaning of short dialogue discourse (5-6 exchanges with two speakers)	Can identify the meaning of short dialogue discourse very well and accurately. Can identify the meaning of short dialogue discourse well and accurately. Can identify the meaning of short dialogue discourse quite well and accurately. Unable to identify the meaning of short dialogue discourse.	1 2 3 4
Responding to monologue discourse	Can identify main thoughts, supporters, and detailed information in monologue discourse very well and accurately. Can identify main thoughts, supporters, and detailed information in monologue discourse well and accurately. Can identify the main thoughts, supporters and information in monologue discourse quite well and accurately. Cannot identify main thoughts, supporting thoughts, and detailed information in a monologue.	1 2 3 4

3.6 The Technique for Analyzing Data

The average data value would calculate when the researcher completes pre-test and post-test. The mean score compared to pre-test and post-test as well as the standard deviation, there was a significant change. The use of the t-test formula determines whether the difference between the test mean values is a result of the treatment. The aim of the study was to compare the measured results before and after the treatment for the students. The steps of data analysis are as follows:

1. Finding the mean of difference

$$\bar{D} = \frac{\sum D}{N}$$

2. Finding the standard deviation of the difference

$$S_{DD} = \frac{S_D}{\sqrt{N-1}}$$

3. Finding the standard error of the mean of difference

$$SE_D = \sqrt{\frac{\sum D^2}{N} - \left(\frac{\sum D}{N}\right)^2}$$

4. Calculating the difference in the mean of the t-test with the formula:

$$t_0 = \frac{\bar{D}}{SE_{\bar{D}}}$$

5. $df = N-1$

Where:

\bar{d} = Mean of difference (the average value of the difference between the pre-test score and the post-test score)

$\sum d$ = The number of differences between pretest scores and post-test scores

N = Number of sample

$S_{\bar{d}}$ = Standard error of mean of difference

S_d = The standard deviation of the difference between the pre-test score and the post-test score

Then, classifying the students' score based on the following classification:

Scoring classification:

Score	Classification
81-100	Very good
61-80	Good
41-60	Average
21-40	Poor
0-20	Very poor