# Assessing the Use of Free Apps to Improve Vietnamese Students' L2 Sound Perception in Pronunciation Training

by

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# Master's Final Project
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# Abstract

Although English pronunciation training has gained more attention in Vietnam, the test-driven orientation of official examinations often leads Vietnamese teachers to neglect this aspect, resulting in unintelligibility when Vietnamese learners use their English. With little or no professional training in pronunciation Vietnamese English teachers tend to avoid speaking English in the classroom and struggle to provide detailed explanations. Therefore, it is crucial to provide more pronunciation training for the Vietnamese teachers to improve their American English pronunciation. This goal can be achieved with the incorporation of the Mobile-Assisted Pronunciation Training (MAPT) apps. This study aims to determine whether or not the use of the apps *Mastering the American Accent* & *Speakometer* can help Vietnamese future teachers/students improve their L2 sound perception after using them for a certain period of time. Additionally, it seeks to understand the students' own perception of their improvement and their overall experience using these apps. The subjects of this study were 40 primary, secondary, and some high school Vietnamese English teachers, divided into the experimental and control groups. The experimental group used the learning materials excerpted from the *Mastering the American Accent* app and *Speakometer*, while the control group used the traditional instructional methods in the classroom. The experiment lasted for 1.5 months. The data collection tools used in this study include the pre and posttest and a questionnaire designed for the experimental group only. The results confirmed the significant improvements of L2 sound perception among Vietnamese students using the MAPT apps in the experimental group and their positive attitudes towards these apps. After analyzing the data using the Repeated Measures ANOVA, the two hypotheses of this study were validated. In addition, they results of the experimental group confirmed the effectiveness of the MAPT apps for pronunciation enhancement, allowing them to identify and correct frequent pronunciation errors

in a motivational way. Overall, *Mastering the American Accent* and *Speakometer* in this study were validated as effective for helping Vietnamese teachers improve their pronunciation and teaching, leading to better pronunciation among Vietnamese students in general.

*Keywords*: MAPT apps, Vietnamese learners, American English pronunciation, L2 sound perception, mobile-assisted technology and language learning.

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---

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*Wherever life plants you, bloom with grace!*

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# Chapter 1: Introduction

## 1.1 A Historical Background of English Learning and Teaching in Vietnam

It is challenging to specify the date of when Vietnamese started learning English as a second language (L2). While many historians argue that Vietnamese first came into contact with English was back in the 19th century, it is certain that French was taught more widely than English or other languages under the French domination (1884-1945). From 1954 to 1975, under the government of the Republic of Vietnam, students from the South could choose to learn English as a foreign language in secondary school (starting with grade 6th and ending with grade 9th) due to the direct interactions with the USA while those from the North prioritized Russian over English because of the direct interaction with the former Soviet Union (Van, 2010). Even when the war ended, from 1975 to 1986, the number of students choosing to learn English as a second language was insignificant.

At the beginning of the reform period (around 1986), English truly became the main foreign language at school in the national education system and was one of the most important subjects chosen as a test subject in the transfer exams. However, it seems that the results of teaching and learning from then on until the early years from the 21st century are still not as good as expected. This claim is supported by a report on the average performance of students taking part in the English national high school exam, which demonstrated that among 3 required tests (math, literature, and foreign languages, including English, Chinese, French, German, Japanese, and Russian), and 2 combinations of natural science subjects (physics, chemistry, and biology) and social science (history, geography, and civics), English was claimed to be the "only subject that Vietnamese students scored less than 5" out of 10 (Quy Nguyen & Tam Duong, 2020).

Also, in the EF EPI's 2018 report, the world's largest ranking of countries /regions on adults' English skills, Vietnamese people's English proficiency ranked 41st out of 88 countries. This results the urgent need to improve the teaching and learning quality English, the so-called universal foreign language.

## 1.2 English in Vietnamese Education

Despite the emphasis on promoting English as a must-learned language, there is room for improvement in the teaching and learning quality in Vietnamese formal education system. It is worth noting that many students are reported to find conducting basic communication challenging even when they completed several English courses provided at schools. While their performances on grammar and vocabulary tests are considered relatively good, their speaking and listening skills are deemed weak. This is particularly true for Vietnamese English teachers whose focused mainly on grammar and reading throughout their learning journey and the training courses provided by the Vietnamese government. An assessment based on the CEFR - Common European Framework of Reference on English competence has been conducted lately for all English teachers teaching primary, secondary, and high schools in Hanoi illustrating that almost all candidates that took part in the IELTS Speaking test scored less than 6.0, in which their levels are described to be limited with frequent lapses of pronunciation features leading to mispronunciation which also cause difficulty for listeners.

This result aligns with the concept of unfavorable fossilization (Catelly, 2012) which indicates that students' errors would be fossilized if there were no intervention from well-trained teachers. The lack of native teachers or experienced and well-trained ESL teachers are considered responsible for this phenomenon. Due to the shortage of authentic exposure to English pronunciation, Vietnamese students may produce various errors, from simple to more complexed,

such as word stress or linking sounds, as well as the reproduction of certain sounds in English. This issue has inadvertently affected students' performances on pronunciation.

The concept of unfavorable fossilization, coupled with the application of the Grammar-translation method, which focuses primarily on grammar, and the Audiolingual Method in teaching pronunciation in a Vietnamese ESL classroom, is believed to result in a much lower pronunciation performance among Vietnamese students compared to grammar or lexicon. This problem with English pronunciation becomes particularly relevant with Vietnamese teachers-to-be. If there is no intervention on their pronunciation problems, they will not be able to help their students overcome and improve English pronunciation difficulties. Therefore, it is imperative to help Vietnamese teachers-to-be improve their English pronunciation to break the circle of poor performance among Vietnamese learners of English.

## 1.3 Literature Review

### 1.3.1 The Use of Mobile-Assisted in Pronunciation Training in EFL

Over the years, Mobile-Assisted Language Learning (MALL) has given rise to Mobile-Assisted Pronunciation Training (MAPT) with the creation of apps that seek to train and help EFL learners improve their L2 pronunciation. In fact, MAPT is a growing field within MALL that is having an enormous impact on English as a Foreign Language (EFL) learning and teaching as new apps are being created and then tested in EFL contexts. Some studies have reported on the effectiveness of using pronunciation training apps to improve students' pronunciation. Fatimah (2021), for example, reported on the positive results of using the *ELSA Speak* app with Indonesian students who need to improve their pronunciation. Tan's study (2021) focused on the use of MAPT to improve intonation through the app *Study Intonation*, designed in 2017. Hirschi et al (2022), in a study carried out in the USA with L2 students of different origins and L1s, focused on adult

ESOL learners' background, technology acceptance and effort to assess their accuracy and the efficiency of *The Communication Tutor* app, developed in 2019 for pronunciation training.

In 2022, a group of six authors: Aratusa et al. (2022) undertook a study to investigate students' perceptions regarding the utilization of Mobile-Assisted Language Learning (MALL) for pronunciation improvement in Tadulako University. They highlighted the positive aspects of MALL perceived by students to improve their English pronunciation. Initially, participants asserted that acquiring proficiency in pronunciation facilitates the attainment of fluency in spoken English. The MAPT apps mentioned in the study, including *Google Translate* and *U-dictionary*, were cited as instrumental in facilitating students' understanding of English enunciation. Furthermore, students also emphasized the usefulness of the features provided by those apps, specifically phonetic transcription (IPA symbols), audio playback, and definition provision. Regarding the possibility of using MAPT apps for future practice and learning English pronunciation, participants expressed that they will continue using those apps due to their practicality and user-friendly interface, particularly when juxtaposed with conventional resources such as traditional physical dictionaries. This finding is consistent with the research conducted by Miqawati (2020) on the efficacy of MAPT apps to enhance pronunciation skills. Miqawati's study revealed that all 30 participants enjoyed using *Tflat English Pronunciation* and successfully attained the target scores (66) thanks to the materials offered by the app, coupled with teachers' guidance throughout the course.

Wongsuriya (2020) conducted an experimental study involving 24 sophomores from Rajamangala University of Technology Isan to assess the effectiveness of utilizing *Google Translate* to improve the pronunciation of difficult words among students living in the remote areas. Despite encountering difficulties in pronouncing words like "genuine", "chaos", "psycho",

"temperature", and "error", participants exhibited a significant improvement in overall pronunciation skills during the posttest assessment. Their mispronunciation problems are claimed to be related to the problem of dual vowels, silent sounds, and the interference of the participants' mother tongue (Thai). Besides, the perception of students regarding pronunciation improvement demonstrated positive outcomes, as nearly all participants claimed that they were motivated to continue using *Google Translate* for pronunciation enhancement, particularly with difficult words, owing to its free accessibility and user-friendly interface.

In 2023, Babekir conducted a study on the use of speech recognition and pronunciation app *FluentU*, with the involvement of 60 sophomores in the English department from Qassim University in Saudi Arabia. This study also included participation of 2 teachers. Before the intervention, these students had negative perception to improve their speaking skills. However, this perception had completely changed after the introduction of *FluentU* to the classroom setting. According to the teachers' evaluation who took part in the experiment, with the use of ASR app, students felt less inhibited to make mistakes in class and were able to produce more natural linguistic features, such as hedging. Although these students still made some grammatical mistakes while speaking, they were much more confident in speaking in English than they were in the pre-intervention stage. In other words, the use of ASR or MAPT apps does help students to feel confident in practice and improves their speaking skills in general, and pronunciation in particular.

Another popular Automatic Speech Recognition (ASR) app was used for pronunciation enhancement is *Elsa Speak*, established by Van Vu in 2015. This app has been purported to be effective in helping students with pronunciation enhancement. A study conducted by Adhan Kholis in 2021 on the use of ASR in English pronunciation skills reported that approximately 90% of the students were enthusiastic and motivated to enhance pronunciation at their own pace. Furthermore,

their performances showed significant improvement over three cycles of using apps for pronunciation training, attributed to the immediate feedback and correction features provided by the app. *Elsa Speak* was also claimed to be the most comprehensive app for pronunciation training (Zakiyyah et al., 2022) because it can be downloaded for free and offers up to 1,200 lessons with 60 different topics, along with the interactive dictionary. In addition, *Elsa Speak* can detect the users' errors with 90% accuracy, which is believed to be highly beneficial for students.

According to Meisarah (2020), a MAPT app encompasses four fundamental principles: (1) it provides tailored resources catering to individual students' needs; (2) it offers flexibility for self-paced learning, (3) it reduces apprehension stemming from privacy concerns, and (4) it provides real-time feedback on students' oral performances. Indeed, MAPT apps, especially those aforementioned, feature user-friendly interfaces, audio playback capabilities, and even ASR technology enabling students to receive immediate feedback on their pronunciation. Some apps offer diverse practice opportunities aimed at enhancing suprasegmental features, which are often inadequately addressed due to limited teacher training and teaching time, or available materials for both teachers and learners (Burri, 2016; Meisarah, 2020; Kholis, 2021).

Another robust evidence supporting the integration of MAPT apps into pronunciation enhancement comes from the study conducted by Rifqiyah, Ardini, and Kusumo (2021). Following the introduction of the Android-based *English Pronunciation App* (EPA) to a group of 32 students, the study reported a significant increase in the percentage of students achieving grade A (excellent) and B (good) with no students failing.

A study on students' perceptions towards the use of *JOOX* application to improve students' pronunciation, conducted by Rahmania and Mandasari (2021), found that this particular app not only helped them to learn better pronunciation but also helped them to acquire new vocabulary.

According to Rahmania and Mandasari (2021), the *JOOX* application provides authentic resources in the form of English songs sung by native speakers. These sources were found to be easy for students to memorize the pronunciation features by imitating and singing along. Thanks to this interesting feature, the majority of students from the experiment concluded that they were intrigued by using the apps with authentic materials.

Adding to this idea, Nurwahida (2020) conducted a study on EFL students' perceptions of mobile apps at Institut Parahikma Indonesia. This study consists of 32 first-year students from the English education in the faculty of teaching and instruction. These students were claimed to have very low English proficiency levels and had little or no experience with standardized tests such as TOEFL or IELTS. So, instead of focusing solely on pronunciation, Nurwahida aimed to find the students' most favorable apps in improving their English competency as well as to figure out what they like or dislike about those apps. Although students faced some difficulties like having no access to the premium content, internet interruption, and annoying pop-up ads, the majority of them still believed that MALLs still helped them to learn English effectively. This is supported by the results of the questionnaire on their frequency of use on those apps, in which up to 44.4% of students claimed using the apps twice a week. In addition to this, students also found MALLs interesting due to the exercises provided in the apps which were categorized for various levels. Moreover, based on the results, Nurwahida also confirmed that the use of MALL in learning can promote autonomous learning.

Therefore, the use of MALL, particularly, Mobile-Assisted Pronunciation Training (MAPT) applications is widely regarded as an effective method to help English learners to enhance their L2 pronunciation training.

### 1.3.2 The Importance of Pronunciation Training for Vietnamese EFL Learners

As previously mentioned, teaching pronunciation has been neglected in the Vietnamese ESL classroom setting, primarily due to the predominant focus on test-driven English classes. This approach has resulted in a lack of attention to the creation and development of teaching and learning materials specifically tailored for pronunciation. In addition to this, there are no specific trainings or materials to deal with pronunciation provided by any parties (Haryadi & Aprianoto, 2020). The test below is an example of the kind of official English tests students take, which clearly neglects pronunciation (see Figure 1).

**Figure 1.**

*The Official English Test for the High School Graduation Exam in Vietnam in 2023*

**BỘ GIÁO DỤC VÀ ĐÀO TẠO** **KỲ THI TỐT NGHIỆP TRUNG HỌC PHỔ THÔNG NĂM 2023**
ĐỀ THI THAM KHẢO **Bài thi: NGOẠI NGỮ; Môn thi: TIẾNG ANH**
*(Đề thi có 04 trang)* *Thời gian làm bài: 60 phút, không kể thời gian phát đề*

**Họ, tên thí sinh:**
**Số báo danh:**

***Mark the letter A, B, C, or D on your answer sheet to indicate the word whose underlined part differs from the other three in pronunciation in each of the following questions.***

**Question 1: A.** thank **B.** thick **C.** that **D.** thing
**Question 2: A.** miss **B.** child **C.** sign **D.** mind

***Mark the letter A, B, C, or D on your answer sheet to indicate the word that differs from the other three in the position of primary stress in each of the following questions.***

**Question 3: A.** balloon **B.** spirit **C.** panda **D.** island
**Question 4: A.** disappoint **B.** satisfy **C.** educate **D.** recognise

***Mark the letter A, B, C, or D on your answer sheet to indicate the correct answer to each of the following questions.***

**Question 5:** The 31st SEA Games, _____ in Vietnam in 2022, left a deep impression on the participants.
**A.** were held **B.** held **C.** holding **D.** were holding

**Question 6:** Life in the city is _____ than life in the countryside.
**A.** exciting **B.** most exciting **C.** the most exciting **D.** more exciting

**Question 7:** Laura will buy a new laptop _____.
**A.** after she had got her salary **B.** when she got her salary
**C.** as soon as she gets her salary **D.** by the time she got her salary

**Question 8:** Linh is keen _cycling to school.
**A.** in **B.** on **C.** about **D.** of

**Question 9:** Your house is opposite the cinema, _?
**A.** does it **B.** isn't it **C.** didn't it **D.** wasn't i

**Question 10:** My hobby is reading _____ books. It's relaxing.
**A.** Ø (no article) **B.** an **C.** the **D.** a

**Question 11:** Our school _ has had a record of 10,000 visits this week.
**A.** software **B.** email **C.** hardware **D.** website

**Question 12:** As a foreign language student, you should learn how to ___ new words in the dictionary.
**A.** look down **B.** write off **C.** look up **D.** take off

**Question 13:** He refused _ overtime to spend the evening with his family.
**A.** to work **B.** work **C.** to working **D.** working

**Question 14:** The other members in the group showed their dissatisfaction with Sarah's not pulling her _ in the project.
**A.** muscle **B.** weight **C.** head **D.** teeth

**Question 15:** The students _____ noisily when the teacher came into the classroom.
**A.** were talking **B.** talk **C.** talked **D.** are talking

**Question 16:** David still _ contact with many of his old school friends.
**A.** catches **B.** brings **C.** takes **D.** keeps

**Question 17:** She hopes that after her book comes out, it _____ by many people.
**A.** reads **B.** will read **C.** was reading **D.** will be read

**Question 18:** Children often like wearing _____ colours on Tet holidays.

Vietnamese teachers from primary to high school have been encouraged to pay more attention to pronunciation. This is evidenced by the inclusion of pronunciation section to the lesson content (see Figure 2). However, this part consistently receives the least amount of time during the lessons. Perhaps, the only innovative approach here is the PDF version, which allows students to listen and repeat at home for further improvements.

**Figure 2.**

*Screenshots Showing the Pronunciation Section in English Book for Grade 6th Learners – Global Success (Published by Vietnam Education Publishing House Limited Company) (Unit 7, page 8)*


Furthermore, because English teaching in Vietnam is more test-driven, which focuses mainly on grammar and reading, so pronunciation tend to be ignored. In the High school Graduation Exam, the pronunciation section has been included, yet there are only 4 questions

compared to 36 other questions on grammar, reading, and vocabulary (see Figure 1). These sections aim to test students' knowledge about word stress and basic IPA sounds (*Questions 1 to 4*). Normally, teachers tend to give them some common rules or even tips to choose the correct answers.

In addition to this, Vietnamese English teachers do not receive proper training from professionals and have little or no authentic exposure to English pronunciation, which hinders their pronunciation competency. Also because of this reason, Vietnamese English teachers are reluctant to use English for instructions in the class (Le, 2013; Robertson, 2003). The shortage of well-trained Vietnamese teachers proficient in pronunciation inadvertently contributes to the weakness of students' overall pronunciation skill. Furthermore, while some public schools in Vietnam have integrated a pronunciation session at the end of each lesson, the limited time available for teachers (typically 45 minutes per session) renders it insufficient for comprehensive coverage. For those reasons, it is necessary to provide a source of authentic materials and training for both Vietnamese teachers and students in order to promote self-regulated learning and improvement of English pronunciation. Therefore, it is of utmost importance to change L2 perceptions of Vietnamese English teachers as well as enhance their overall production of L2 pronunciation. By doing this, they can be better equipped and be able to provide a more effective pedagogy in their classrooms. Vietnamese students aspire to achieve the mastery level of a specific English accent, namely American, British, and Australian, perceived as standard accents in their pursuits of internationalized English learning. This perception still dominates the majority of Vietnamese students' mindsets, especially those who received pronunciation training after the Vietnamese reform period. Huong Le Thu Phan's survey results (2020) after assessing Vietnamese students' attitudes towards familiarity and conative feelings shows that Vietnamese

students seem to prefer General American English (GA) because it is more familiar to them in school settings. In addition to the goal of accurate pronunciation, both Vietnamese students and teachers believe that learning pronunciation is just as important as other language skills (Nguyen et al., 2021). While the main focus is still on preparing students for national tests, there is a growing emphasis on learning American pronunciation to achieve a more practical and functional command of the language.

As observed, pronunciation is often viewed as the least relevant or useful of the fundamental language skills; therefore, sacrificing it in lessons to have more time for so-called more-important-skills is understandable (Jackson, 2016 & Pennington, 2021), particularly in the case of Vietnamese ESL learning and teaching where students' motto for learning is passing the tests instead of using the target language. Having a good level of pronunciation can help speakers to avoid the possibility of serious misunderstanding (Jackson, 2016) as there will be a minimization of repeated clarification and further explanation.

### 1.3.3 Common Pronunciation Problems among Vietnamese Students

According to Ha (2005), Vietnamese learners tend to make three main types English pronunciation errors including sound omission, sound confusion and sound redundancy (see Table 1).

**Table 1**

*Common Pronunciation Errors (adapted from Ha, 2005: 42)*

| Types of errors | | No. of subjects with errors |
|---|---|---|
| **Sound Omitted** | **medial**: l, ʤ, r, s, i, ei, k | 19 |
| | **final**: z, s, t, v, ks, ʤ | 25 |
| **Sound confusion** | t = ʧ | 13 |
| | tr = ʧ | 16 |
| | ð = z/d | 10 |
| | ʃ = s | 15 |
| | ʤ = /j/d/s/t/z/ʧ/ | 13 |
| | s = /ʃ/ʒ/ | 11 |
| | p = b; ʧ = s | 9 |
| | θ= /s/t/ ; r = z | 7 |
| **Sound redundancy** | s, z, | 13 |

It is understandable why Vietnamese learners tend to omit the sound, particularly ending sounds because the ending sounds are not pronounced in this language. Medial sounds (/l/, /dʒ/, /r/, /s/, /i/, /eɪ/, /k/) and final sounds (/z/, /s/, /t/, /v/, /ks/, /dʒ/) are commonly ignored by Vietnamese learners. Besides, some sounds are considered particularly challenging for Vietnamese to pronounce, which are /ʒ/, /dʒ/, and /tʃ/, especially when they appear at the end of a word. This could be explained due to the differences in the sound system used in Vietnamese regardless of regional accents. /tʃ/ does not exist in Vietnamese and people will pronounce [t͡ʂ] (tr-) or [t͡ɕ] (ch-) instead. It is worth mentioning that people from the North of Vietnam barely differentiate between these two sounds [t͡ʂ] (tr-) or [t͡ɕ] (ch-), therefore, it is even more difficult for them to notice the similarities and differences between /tʃ/ and [t͡ʂ] or [t͡ɕ] in Vietnamese. However, this problem could be addressed more easily while working with people from Central Vietnam where they clearly pronounce the [t͡ʂ] and [t͡ɕ]. Similarly, Northern Vietnamese people tend to

overgeneralize or oversimplify the letters d-, r-, gi- , which are pronounced /z/, /r/, /j/, respectively, in Vietnamese, which possibly become an obstacle for them to learn how to pronounce /ʒ/. On the other hand, the /ʒ/ problem could be solved easily with Southern Vietnamese where all letters d-, r-, gi- are pronounced /ʒ/. Finally, the sound /dʒ/ per se is simply non-existing in Vietnamese, which is why Vietnamese find it difficult to pronounce. Because of the sound confusion even in the native Vietnamese language, learners tend to omit the sounds or even "vietnamize" those sounds to make them easy to learn and pronounce. Take *massage* as a prime example. The English phonetic transcription for this word is /məˈsɑːʒ/. This is considered a borrowed word from English, and in order to use it in a daily context more easily, people vietnamize it and pronounce it as into mát-xa /mat-sa/.

Another common errors of sound confusion frequently made by Vietnamese is /t̪ʰ/ versus /ð/ and /θ/. This is considered the most challenging sound for most of Vietnamese learners. The articulation itself to pronounce /ð/ and /θ/ sounds is complicated for Vietnamese itself. To pronounce /t̪ʰ/, people need to start with the /t/ sound first, which is produced with the tip of the tongue against the alveolar ridge, similar to the English /t/ sound, but with a puff of air (aspirated). Meanwhile the /h/ sound is pronounced as a voiceless glottal fricative, produced with a slight constriction of the vocal cords. Compared to the /ð/ and /θ/ sounds, while the /ð/ sound is a voiced dental fricative and produced by placing the tip of the tongue against the upper front teeth and allowing the vocal cords to vibrate, the /θ/ sound is the voiceless dental fricative and is produced by the same tongue placement as /ð/ but without vocal cord vibration. Therefore, when encountering words with these sounds, Vietnamese often approximate them with sounds available in their own mother tongue. For instance, /ð/ may be rendered as /d/ or /z/, whereas /θ/ may be pronounced as /t/ or /s/.

Similarly, Vietnamese learners tend to mispronounce /s/ instead of /ʃ/ and /ʒ/. This is particularly true for people from Northern Vietnam, especially the capital, where /s/ and /ʃ/ have no differences.

Last but not least, Vietnamese have formed a habit of adding /s/ to pretty much all words in English (Ha, 2005). The problem behind this phenomenon is the over-pronunciation or overuse the pattern when learners try to emulate new difficult patterns in a target language. Since Vietnamese add no /s/ to make the word plural, Vietnamese ESL teachers tend to emphasize the importance of having /s/ pronounced clearly when they try to use the plural form of words. Eventually, this becomes a hard habit to kick in Vietnamese ESL learning setting.

Other common pronunciation problems were listed in Nguyen and Dang's study (2022) including intonation and consonant cluster reduction. First and foremost, there are huge differences between Vietnamese and English intonation. Vietnamese is a tonal language in which the meaning will change due to the pitch level and/or contour signal made by speakers (Luu, 2010). There are six tones, including mid-level (ngang/không), low-falling (huyền), high-rising (ngã), low-falling-rising (hỏi), high-rising broken (sắc) and low-falling broken (nặng). In other words, a word with the same base can have a different pronunciation and unrelated meaning when it carries different tones as follows:

**Table 2**

*Vietnamese tonal designations ad parallel descriptions in English intonation (adapted from Luu, 2010: 173)*

| Tone | Diacritic | English Description | Examples |
|---|---|---|---|
| Ngang/Không<br>(Mid-level) | (no marking) | High-level tone | vi<br>(name of a person) |

| | | | |
|---|---|---|---|
| Huyền<br>(Low-falling) | ` | Low-falling tone | vì<br>(because) |
| Ngã<br>(High-rising) | ~ | High-abrupt tone | vĩ (hùng vĩ)<br>(magnificent) |
| Hỏi<br>(Low-failling-rising) | ʔ | Low-rising tone | vỉ<br>(pack) |
| Sắc<br>(High-rising broken) | ´ | High-rising tone | ví<br>(wallet) |
| Nặng<br>(Low-falling broken) | . | Low-abrupt | vị<br>(taste) |

Because of this significant difference, Vietnamese pronunciation is considered sharper and clearer. This is one of the main reasons why Vietnamese always sound “overdramatic” in English when pronouncing words in English, as they tend to make unnatural intonation contours.

Vietnamese does not have consonant clusters, either in initial or final position, so Vietnamese learners tend to reduce or even delete consonants in each English words (Nguyen & Dang, 2022). Therefore, any attempt to improve Vietnamese learners’ pronunciation in English should take into account the differences between the two languages and, at the same time, grant students plenty of practice on perception so that they can improve their pronunciation and become more intelligible.

### 1.3.4 Perception versus Production in Pronunciation Training in EFL

There are three different types of instructional approaches when it comes to pronunciation training: those that focus on perception, on production or a combination of both. While the former

aims to increase participants' identification or discrimination abilities, the latter tries to elicit the correct articulation of the target features making use of corrective feedback (Lee, Plonsky, and Saito, 2020). Many different studies on L2 pronunciation training have focused only on perception (Catford & Pisoni, 2013; Cibelli, 2022), others on production, others on the interrelation of both perception and production (Leather, 1996), and some on the effects of combining both perception and production (Wong, 2013; Herd et al, 2013).

Lee, Plonsky, and Saito (2020) clearly consider the perception over the production protocol more effective for pronunciation training, the study focuses on L2 sound perception for pronunciation training. Their perspective also aligns with the findings of Flege, John, and Jang (1997). Taking the critical period hypothesis into consideration, the focus on perception during that period allows learners to develop native-like pronunciation before the influence of their L1 becomes dominant. Moreover, prioritizing perception over production can help learners discriminate and internalize new sounds in their target language, thereby reducing the impact of the interference from their native language. Lee, Plonsky, and Saito (2020) also asserted that a robust foundation in perception can serve as a precursor to accurate production; therefore, learners can replicate the target sounds in their speech once they get the accurate perception to distinguish sounds in English. Therefore, this study on L2 pronunciation training, focuses on enhancing students' sound perception rather than on sound production.

### 1.3.5 MAPT Apps for Pronunciation Training

With the rapid development of technology and the emergence of Mobile-Assisted Language Learning (MALL), many developers have introduced applications tailored for English learners, particularly focused on pronunciation. In order to find out which are the most suitable applications for Vietnamese English learners, several outstanding applications will undergo

evaluation according to the following criteria in order to find out which are the most suitable applications for participants in this study and Vietnamese English learners in a broader context. These criteria include (1) content quality, (2) user interface and experience, (3) interactivity and engagement, (4) personalization and adaptability, (5) feedback and assessment, and (6) cost-effectiveness and value.

One of the most renowned applications for pronunciation enhancement is *Elsa Speak*, which has garnered significant attention from researchers within the linguistic field. *Elsa* stands for English Language Speech Assistant. Developed to cover three main scopes of pronunciation teaching, namely sound, rhythm, and intonation (Anggraini, 2022), *Elsa Speak* plays a crucial role in guiding English learners towards proficiency. One of the fundamental elements of its approach is the ability for learners to identify the sound of a word based on its phonetic transcription, setting a solid foundation before delving into suprasegmental aspects of English pronunciation (Akhmad & Munawir, 20222). Throughout the learning experience with *Elsa Speak*, learners progress from practicing their pronunciation at a word level, to conversation, then intonation. The application prompts learners to imitate native speakers by repeating given phrases, sentences, short scripts for videos, or particular sounds and intonation patterns. With its user-friendly design, *Elsa Speak*'s has a purple-galaxy background and an intuitive placement of main functions at the bottom of the devices, which helps users navigate and use it with ease. In addition to this, *Elsa Speak* offers rewards to motivate learners upon completing lessons, fostering motivation and encouraging continued usage for their pronunciation enhancement. Regarding to the automatic speech recognition (ASR), *Elsa Speak* is able to detect students' pronunciation errors followed by instant personalized feedback and follow-up practice. The app then provides a clear explanation and uses color-coded error indicators to assist students in identifying and

addressing their mistakes effectively (Sholekhah & Fakhrurriana, 2023). *Elsa Speak* offers three subscriptions packages $98.99 for Elsa Pro Lifetime membership, $43.19 for 1 year membership, and $19.99 for 3 months membership. These prices, however, are relatively high for Vietnamese students. With this expensive fee, Vietnamese English learners would rather spend their money on classes in a language school.

Similarly, *FluentU* and *HelloTalk* are apps recommended to aid students with their English. Both platforms allow users to explore a diverse range of content sourced from authentic materials such as movie trailers, music videos, and short learning videos, each video is accompanied by a transcription to help users understand what they are watching (Rahmadini & Ramadhani, 2024). The user interface of both apps is also friendly for users with main functions conveniently located at the bottom of the devices, which allow users to navigate to the target skills they want to learn. *HelloTalk* distinguishes itself from other applications on the market with three unique functions which are *search*, *talks* and *moments*. The *search* function enables users to find native speakers of the target language for conversational practice, which is a valuable asset for those aiming to improve their speaking and pronunciation. In addition, the *talks* function allows users to stay connected with their friends met through the *search* feature, while the *moment* function serves as a news feed where users can post questions or seek help from native speakers available on the platform. Users can receive personalized feedback about either their grammar or pronunciation in the comments below their posts. It is worth noting that users have to be cautious about sharing personal information and maintain their privacy. In contrast, *FluentU* falls short in terms of improving pronunciation and speaking skills due to the absence of conversational practice and the speech recognition technology, which are pivotal for providing personalized feedback and

clear explanation for further improvement. *FluentU* is more expensive with $139.99 for anual access when compared to $79.99 of *HelloTalk*.

*Duolingo*, another popular application for English language learning, presents itself as a more cost-effective option, priced only $6.99/month for the Duolingo Plus. The app interface is friendly for users featuring vivid color and the unique symbol of the green owl, coupled with the gamification system, facilitating seamless navigation through various lessons and activities. After completing the lesson, users can revise what they have learned as well as to get more extra points for their profile through engaging activties. This fosters motivation throughout their learning journey. Furthermore, *Duolingo* adopts a game-based learning approach to make the language learning process become more engaging and comfortable (Mahmudah, 2015). In addition to this, *Duolingo* provides a systematic learning structure, starting from the foundational concepts and gradually progressing to more advanced lessons. Each lesson encompasses diverse skills to ensure a comprehensive learning experience. However, *Duolingo* falls short in the realm of pronunciation enhancement. While equipped with the automatic speech recognition (ASR) technology, users are limited to practicing sentences beyond lessons. In other words, users may struggle to grasp the nuances of English pronunciation, hindering their aspirations to achieve native-like proficiency. Also, this platform lacks personalized feedback or detailed explanations, particularly in pronunciation, compared to *Elsa Speak*'s comprehensive approach. This deficiency poses challenges to users who seek to improve their English proficiency. Although Duolingo provides a substantial number of lessons for free users, it remains ineffective for English pronunciation improvement.

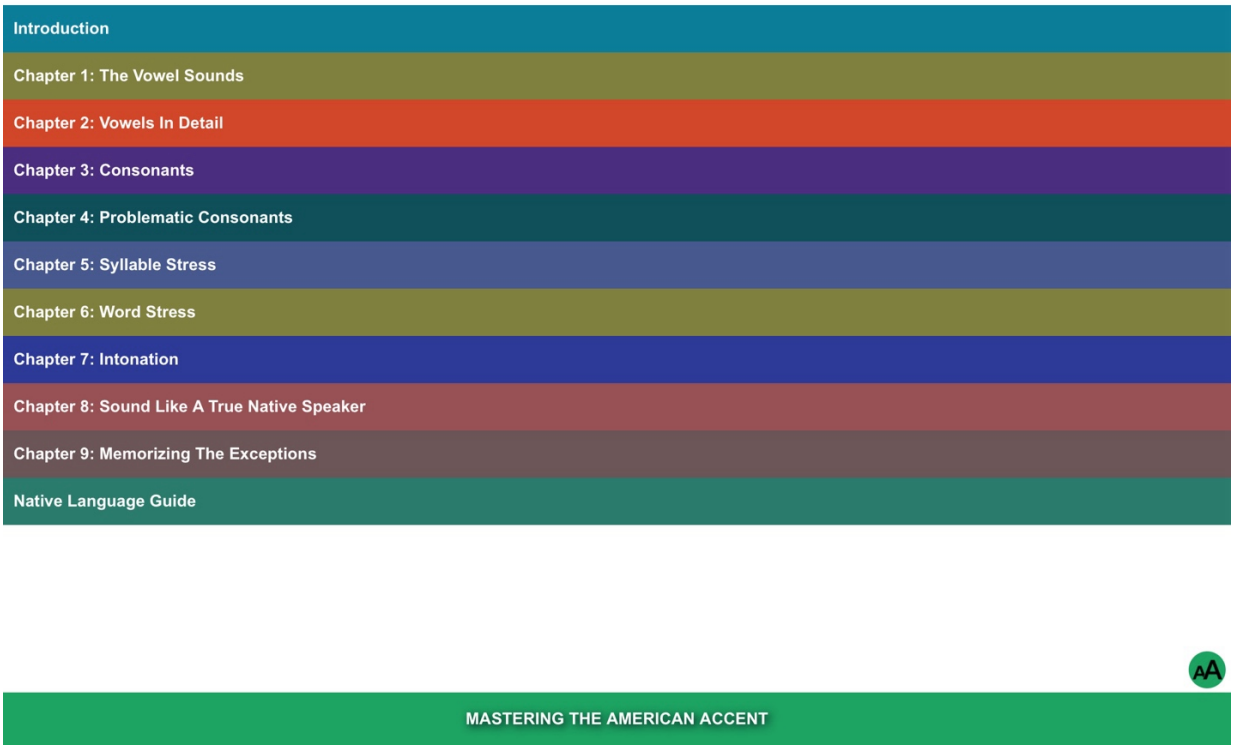
Assessing these applications available on the market according to the aforementioned criteria is necessary to identify the best free applications that can improve not only the perception

of Vietnamese L2 learners but also their pronunciation proficiency. In this sense, *Mastering the American Accent* & *Speakometer* are two recommended apps that focus on pronunciation training and are freem which are important aspects to take into account for this study.

Acknowledging the common challenges of Vietnamese students in pronunciation, *Mastering the American Accent* emerges as the optimal choice for the following compelling reasons. First and foremost, it has high-quality content with a structured approach to phonetics, covering both segmental and suprasegmental aspects. Every lesson in each chapter is written but includes also audio so that learners can follow the words while hearing the recordings. The same happens with the exercises. Users progress from practicing individual words to mastering phrases and sentences, with dedicated sections to minimal pair exercises to hone their ability to discern sound differences. Each chapter is color-coded, facilitating easy revision for users (see Figure 3 below). Second, *Mastering the American Accent* also has a specific section called *Native Language Guide*, to address common pronunciation issues encountered by Vietnamese students specifically.

**Figure 3.**

*List of color-coded chapters available in Mastering the American Accent*




Each chapter includes different lessons with plenty of explanations and practice (see Figures 4 and 5 below). Every lesson in each chapter is written but includes also audio so that learners can follow the words while hearing the recordings. The same happens with the exercises. Users progress from practicing individual words to mastering phrases and sentences, with dedicated sections to minimal pair exercises to hone their ability to discern sound differences. Once users complete the chapter, it automatically turns green with the tick symbol indicating the users' progressions. Thirdly, each chapter features authentic American-accent audio for users to practice, guaranteeing exposure to genuine pronunciation models.

**Figure 4.**

*Example of the content in Chapter 1 on the vowel sounds in Mastering the American Accent*

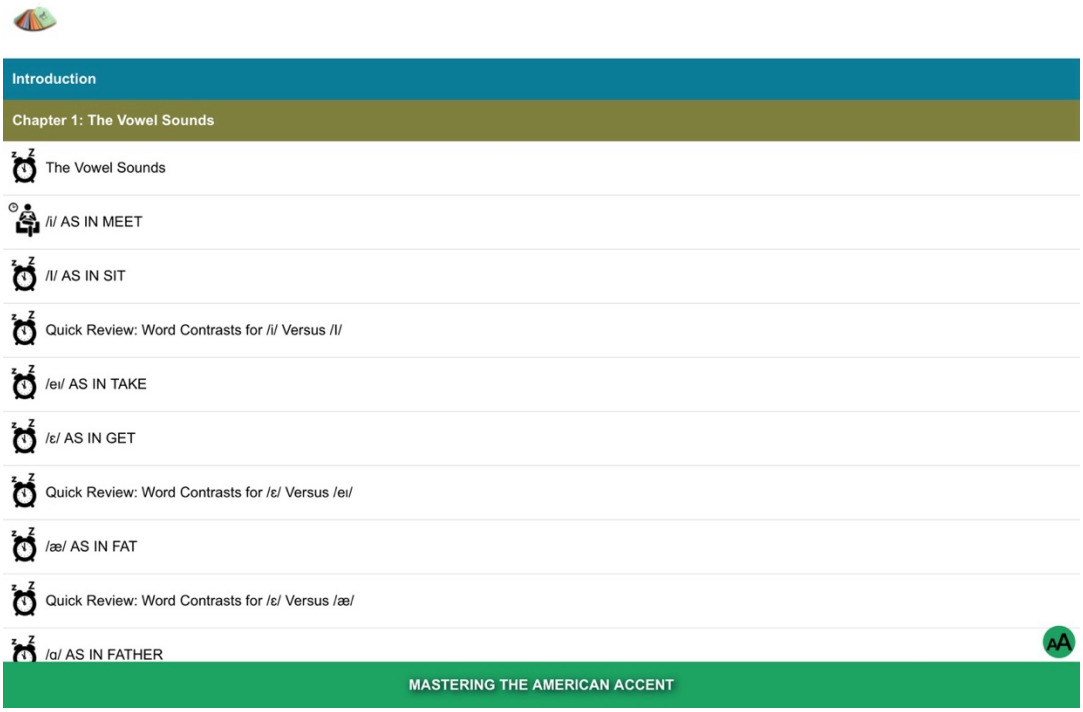
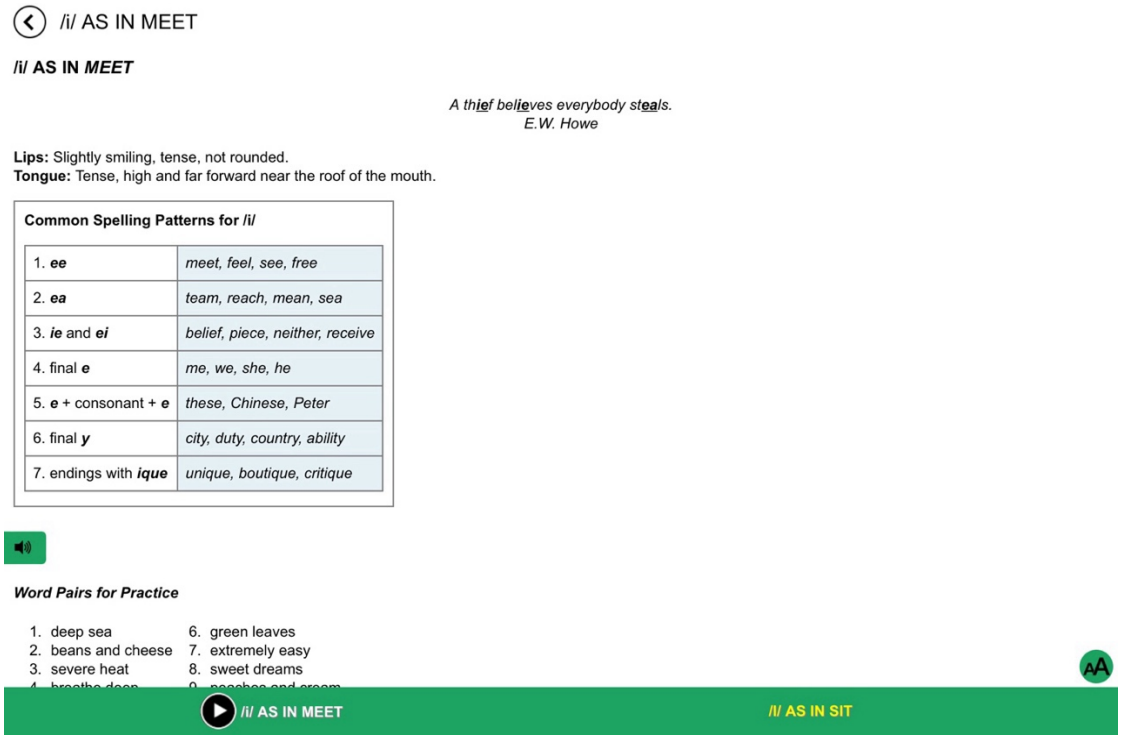



**Figure 5.**

*Example of the content in Chapter 1 on /i/ in Mastering the American Accent*

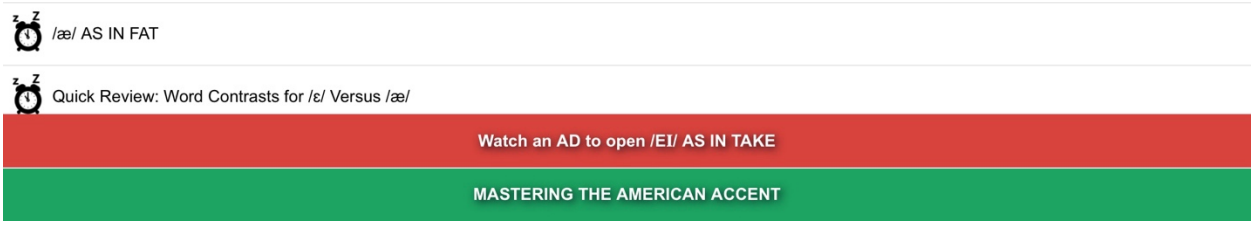


By combining the instructional methodology provided in the classroom and activities from the app, Vietnamese students can anticipate significant improvements in their pronunciation. Lastly, the *Mastering the American Accent* app is a completely free app that is accessible across all platforms, including App Store (for Apple devices) and Google Play (for Android devices). This accessibility ensures that learners can easily access the app regardless of their device preference, facilitating widespread adaptation and usage among Vietnamese learners.

As a free app, *Mastering the American Accent* has also a few downsides. For example, when you are listening to an audio from the lesson, a pop-up commercial on apps for improving your English starts to play (see Figure 6 below). Ads are relatively short (typically 30 seconds), and when they finish, you have to close it and then listen to the audio from the lesson. This can be a little disruptive for users.

**Figure 6.**

*Indication (in red) showing users will have to watch a pop-up commercial before being able to view the contents of the lesson*



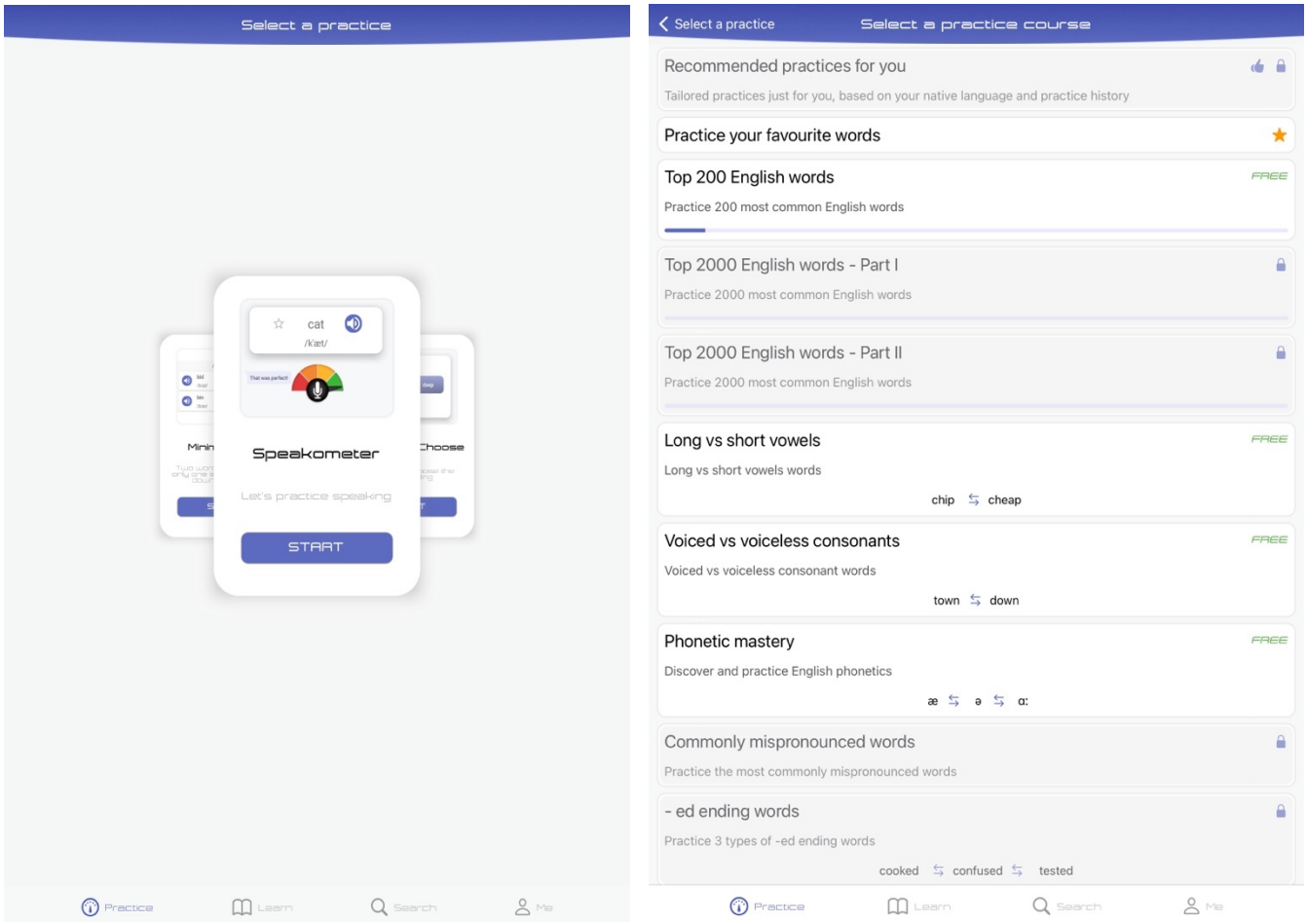

Another negative aspect is that *Mastering the American Accent* does not provide any personalized feedback on the user' pronunciation or engaging activities compared to other apps mentioned above. Therefore, it is imperative to supplement its use with another app capable of addressing this gap, and that app is *Speakometer*.

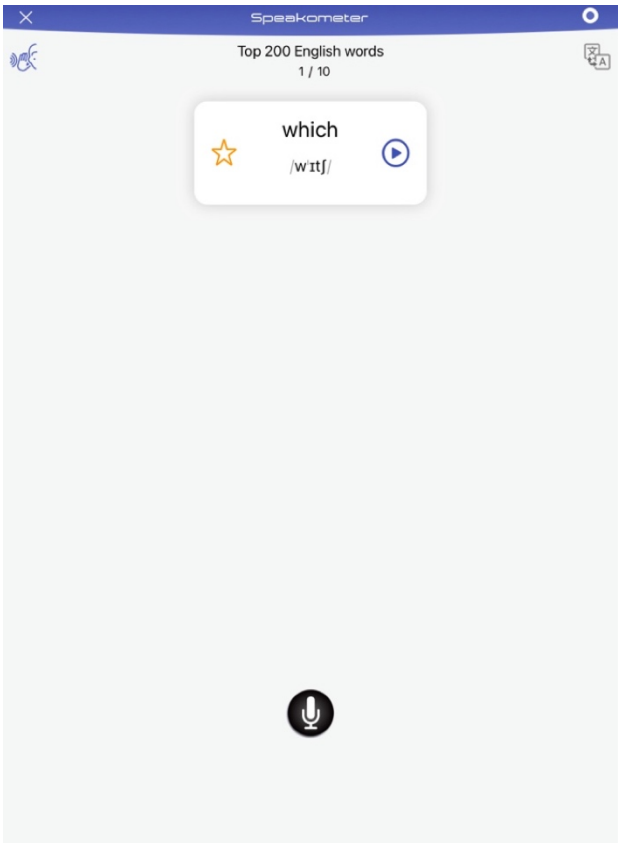
As to *Speakometer – Accent Training*, it is an app that complements *Mastering the American Accent*. *Speakometer* is a valuable app for English pronunciation improvement, which

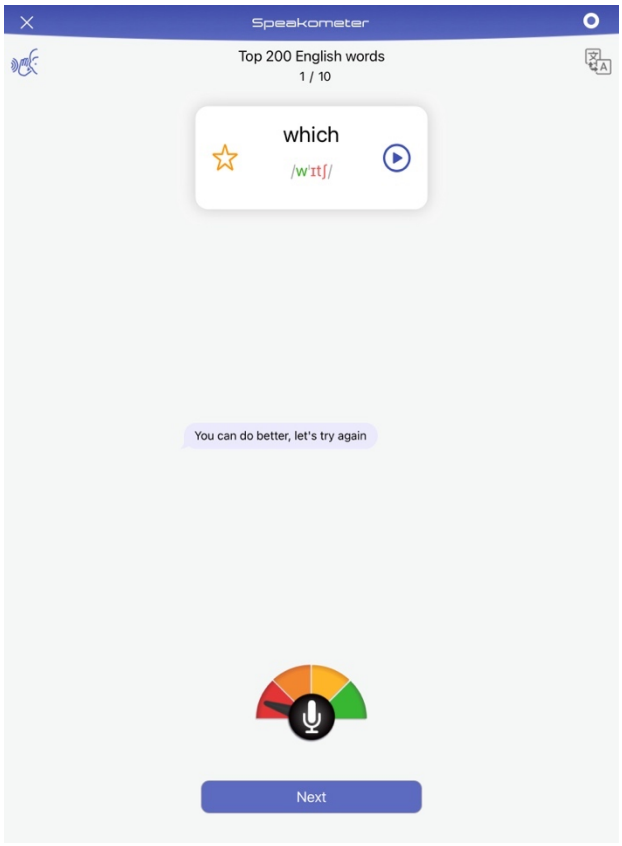
includes advanced automatic speech recognition (ASR) technology and Artificial Intelligence to assess users' pronunciation proficiency and ability to reproduce sounds and words. With over 2,000 English words and the system of English sounds available for practice, users can select their preferred accent to practice, which can be adjusted as needed throughout the learning process. Each sound is accompanied by common minimal pairs of words, helping users in distinguishing between sounds effectively. A practice session consists of 10 words each and they are automatically refreshed to provide a new set of words for continuous practice. Users can easily monitor their progress within the app by reviewing recorded audio and identifying pronunciation errors color-coded by the app. Furthermore, *Speakometer* offers access to a vast database of over 65,000 words, each accompanied with a pronunciation practice. This feature facilitates not only the expansion of users' lexical range but also the improvement of their pronunciation skills. Besides, thanks to automatic speech recognition technology, users can record themselves when they pronounce words for practice and they get instant feedback on their performance (see Figure 7 below). While the translations for these words are exclusive for premium users, the free functionalities, such as assessment by ASR and automatic word lists updates for practice, suffice for most users who just need the practice on sound perception and a quick assessment of their own production after repeating words they heard.

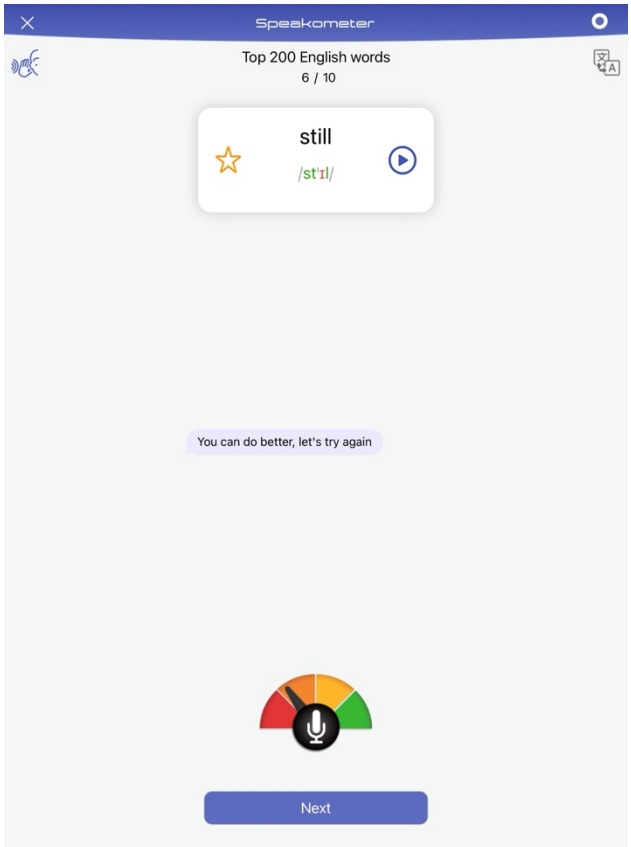
**Figure 7.**

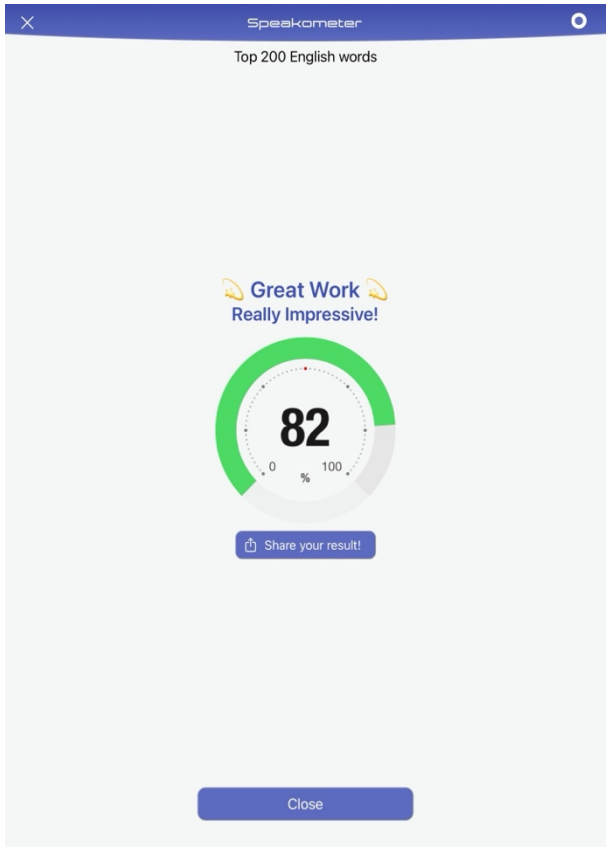
*Contents of the app, feedback provided by AI and options for consonant and vowel practice available on Speakometer*

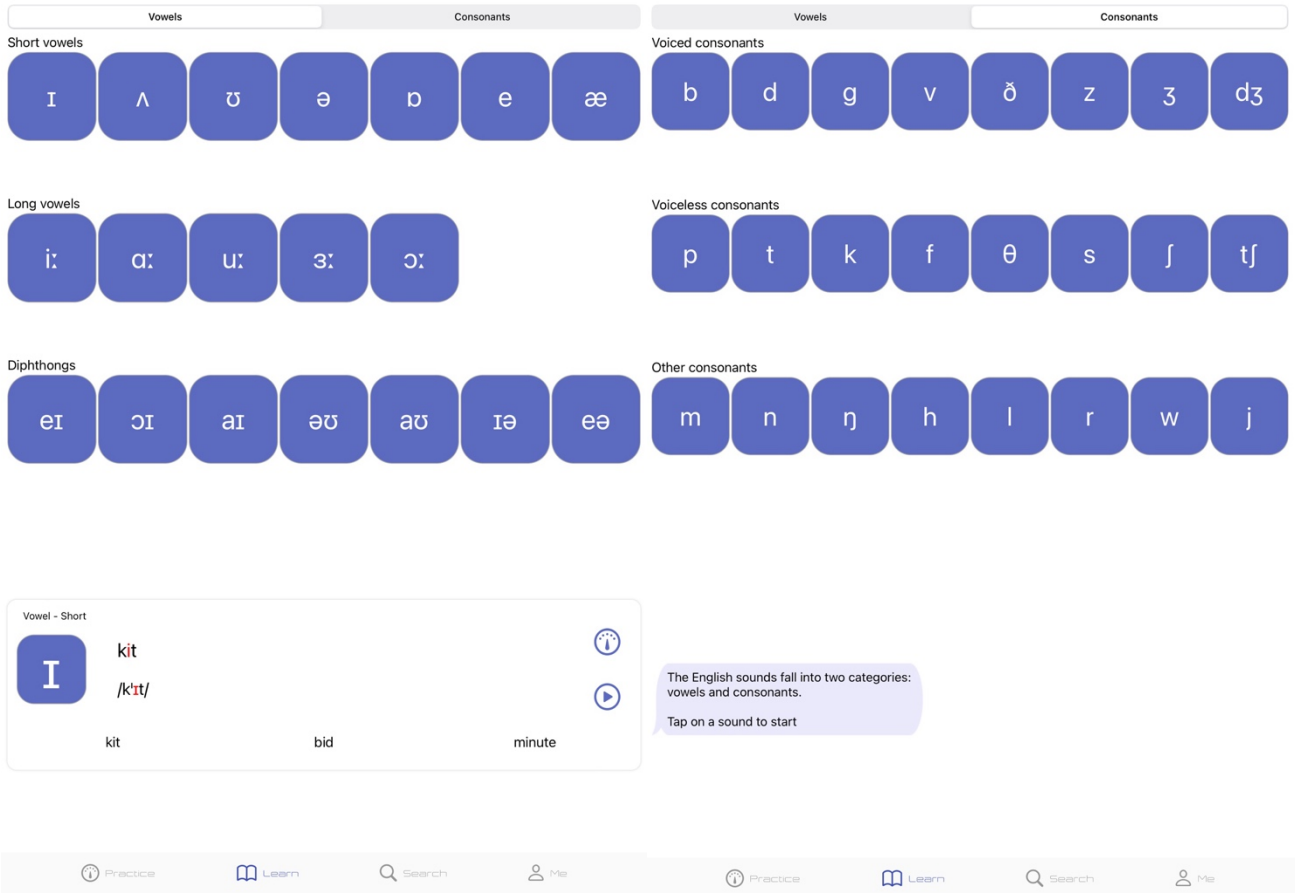



Speakometer
Top 200 English words
1 / 10
which
/wɪtʃ/


Speakometer
Top 200 English words
1 / 10
which
/wɪtʃ/
You can do better, let's try again
Next


Speakometer
Top 200 English words
6 / 10
still
/stɪl/
You can do better, let's try again
Next


Speakometer
Top 200 English words
Great Work
Really Impressive!
82
0
100
%
Share your result!
Close




These two free MAPT apps emerge as the best options for this study. They can nicely complement the instructional methods used in class, provide specific instruction and practice on pronunciation, and are expected to change Vietnamese students' perceptions of learning English pronunciation while enhancing their proficiency in American English pronunciation.

## 1.4 Aim of the Study

Given the importance of improving Vietnamese teachers' English pronunciation, this study seeks to incorporate two free MALL apps into their own learning journey as it can first benefit them as teachers and later their own students. Therefore, acknowledging the effectiveness of mobile technology, especially the use of free apps for pronunciation training, this study aims to find out if the use of the apps *Mastering the American Accent & Speakometer* can actually help

Vietnamese future teachers/students improve their L2 sound perception after using them for a certain period of time. This study also explores the students' own perception of their improvement after using those apps and their general experience using them. It is expected that the use of these two free apps can help Vietnamese future teachers/students using them now and thus become better and more efficient teachers in primary, secondary, and high schools in the future.

## 1.5 Research Questions and Hypotheses

Although some studies have discussed the use of MAPT apps for pronunciation training with Asian students in general, there are no studies that center on the specific pronunciation problems of Vietnamese L2 learners or that use the two MAPT apps chosen for this study, *Mastering the American Accent* & *Speakometer*. Therefore, this study seeks to fill in a gap in the literature with the resulting research questions:

***Research Questions***:

1) What is the impact of free MAPT apps (*Mastering the American Accent* & *Speakometer*) on the L2 sound perception of Vietnamese learners?
2) To what extent do Vietnamese students perceive the use of free MAPT apps designed for American English pronunciation training as effective to improve their overall pronunciation?

***Hypotheses***:

1) Alternative Hypothesis (H1): The use of free MAPT apps (*Mastering the American Accent & Speakometer*) significantly improves the L2 sound perception of Vietnamese learners compared to the instructional methods used in the Vietnamese classroom.
2) Null Hypothesis (H0): There is no significant impact of using MAPT apps (*Mastering the American Accent & Speakometer*) on the L2 sound perception of Vietnamese learners compared to instructional methods used in the Vietnamese classroom.

3) Alternative Hypothesis (H1): Vietnamese students perceive the use of free MAPT apps designed for American English pronunciation training as highly effective to improve their overall pronunciation.
4) Null Hypothesis (H0): There is no significant perception among Vietnamese students of the effectiveness of free MAPT apps designed for American English pronunciation training as highly effective to improve their overall pronunciation.

# Chapter 2: Methodology

## 2.1 General Approach to the Experiment

A quasi-experimental research design was used to carry out this study to determine whether there is a causal relationship between the use of free Mobile-Assisted Pronunciation Training apps with Vietnamese students and their improvements and perception of that improvement. Therefore, in this study the Independent Variable is impact of using free MAPTS apps with Vietnamese students is the Independent Variable, whereas the Dependent Variables are heir improvement in L2 sound perception and their own self-perception of that improvement after using those apps are the Dependent Variables.

## 2.2 Academic Context

The experiment took place at IDYLLISH Language Academy located in no.190, Ha Dinh Street, Thanh Xuan District, Hanoi, Vietnam, with participants who had completed the IELTS Intermediate Course (scoring between 5.0 and 6.0). IDYLLISH is a private language academic that offers language courses for various types of students, ranging from junior to adults. At IDYLLISH, there are main courses including English Communication, IELTS, TOEFL, Academic English (specialized for students who study abroad), and Pronunciation Training. All students are native Vietnamese, and mostly Northern Vietnamese students take offline courses while online courses are more common for students from the Middle and Southern Vietnam.

## 2.3 Participants

40 Vietnamese students (N=40) aged from 24 to 50 years old who are currently working as English teachers in primary and secondary schools in Hanoi volunteered to participate in this study. It is worth noting that there are 10 of them are working at high schools in Hanoi. There

were up to 80% of the participants were females and 20% were male teachers. 100% of participants are from the North of Vietnam. All participants scored 4.0 to 6.0 in the IELTS test taken from November 30th to December 22nd, which ranges from A2 to B2 level, according to the CEFR level. The results were sent to student's phones through SMS by the British Council Vietnam (BC Vietnam). The test results were fully consented by students. The lowest grade in pronunciation particularly is 4.0, denoting a limited grasp of pronunciation features with frequent lapses and mispronunciation causing difficulties for listeners, while the highest is 6.0, indicating the ability to use a variety of pronunciation features with mixed control, intermittent effective usage, and can be understood throughout despite occasional mispronunciations of individual words or sounds which detract from clarity at times. Noticeably, all of the participants in this study graduated from Hanoi University of Education with a specialization in English teaching. However, a significant numbers of participants expressed a lack of formal training in teaching English as a second language during their university education, and even after graduation. Moreover, the standardized national English proficiency test primarily emphasizes grammar and reading, neglecting the focus on pronunciation, speaking, and listening skills. Although this test has been tailored with a pronunciation section, it remains a paper-based test, failing to require students to demonstrate actual pronunciation skills. In other words, if a student gets a 9 for his/her English test, it does not mean that he/she reaches the native-like level in English. Consequently, Vietnamese English teachers often overlook the importance of improving their own pronunciation and integrating pronunciation instruction into their teaching practice.

The majority of participants were reported to have no speech or learning difficulties or any other disabilities that potentially influenced the study outcomes. Only 3 participants exhibited the mispronunciation of /l/ and /n/ in both Vietnamese and English. In addition to this, none of the

participants had traveled to an English-speaking country or received any training with native English speakers, resulting in a lack of exposure to authentic English teaching and learning environment.

A total of 40 participants was evenly divided into two groups, experimental and control. Each consisted of 20 students. Their objective was to further improve their overall band score in the IELTS Academic Training, especially in IELTS Speaking, with a score exceeding 6.0. Each class had a private tutor to assist them in the weekly speaking workshop. These tutors possess qualification of a minimum overall band score of 7.0 in the IELTS exam, with a specific score of 7.5 or higher in Speaking.

The experimental group continued with the course using the instructional method in the classroom in combination with the use of the MAPT applications, *Mastering the American Accent* and *Speakometer*. To achieve best results, the English pronunciation instructor (and researcher in this study) designed specific learning materials for the participants from the experimental group (see Appendix E) using the contents of the app *Mastering the American Accent*. This parallel course on pronunciation was taught online. Comprising a total of 8 sessions, each session is dedicated to addressing a particular aspect of pronunciation. This online course lasted for 6 weeks (1.5 months) with 24 training hours in total (2 hours per session, 2 sessions per week). These sessions sought primarily to deal with common mistakes made by Vietnamese English learners. The study acknowledged the shortage of time that these teachers have, so the contents used throughout the course were excerpted from the *Mastering the American Accent* app and supplemented with the use of IPA Phonetic charts. This approach helped participants become more familiar with the apps and provided additional practice activities after class. Moreover, the excerpted content was carefully chosen by the instructor, which helped students to focus on

particular mistakes produced commonly by Vietnamese learners as the *Mastering the American Accent* app also covers common mistakes produced by Chinese, Filipino, Spanish, to name but a few. Most importantly, the use of instruction materials with detailed explanations and precise comparisons between Vietnamese and English helped participants to improve their perceptions about L2 pronunciation, leading to immediate improvements in production. After every lesson, participants revised what they had learned and practiced on *Speakometer*. This combination of the content from *Mastering the American Accent* and *Speakometer* apps ensured the comprehensive pronunciation training for the participants. While participants received personalized feedback from the instructor and had real-time interaction with the instructional learning materials, they also had additional practice activities and resources outside the class time. In addition to this, participants gained an understanding of their strengths and/or weakness in English pronunciation thanks to feedback from the instructor and the feedback provided by the AI in *Speakometer*, allowing them to personalize their practices for more consistent improvement.

Whereas the experimental group had this specific pronunciation training course delivered online, the control group did not follow the same teaching and learning materials designed for the experimental group. Specifically, the control group simply followed the Audiolingual method usually used in the classroom with all students, in which participants listened and repeated the given sets of words that they had in their lessons (see Appendix F). Besides, the Grammar Approach was also used throughout the course just like many traditional English classes do in Vietnam.

## 2.4 Data Collection Tools

This study used two data collection tools: a pre- and posttest on L2 sound perception and a 5-point Likert Scale Questionnaire. The pretest and posttest measured students' improvement

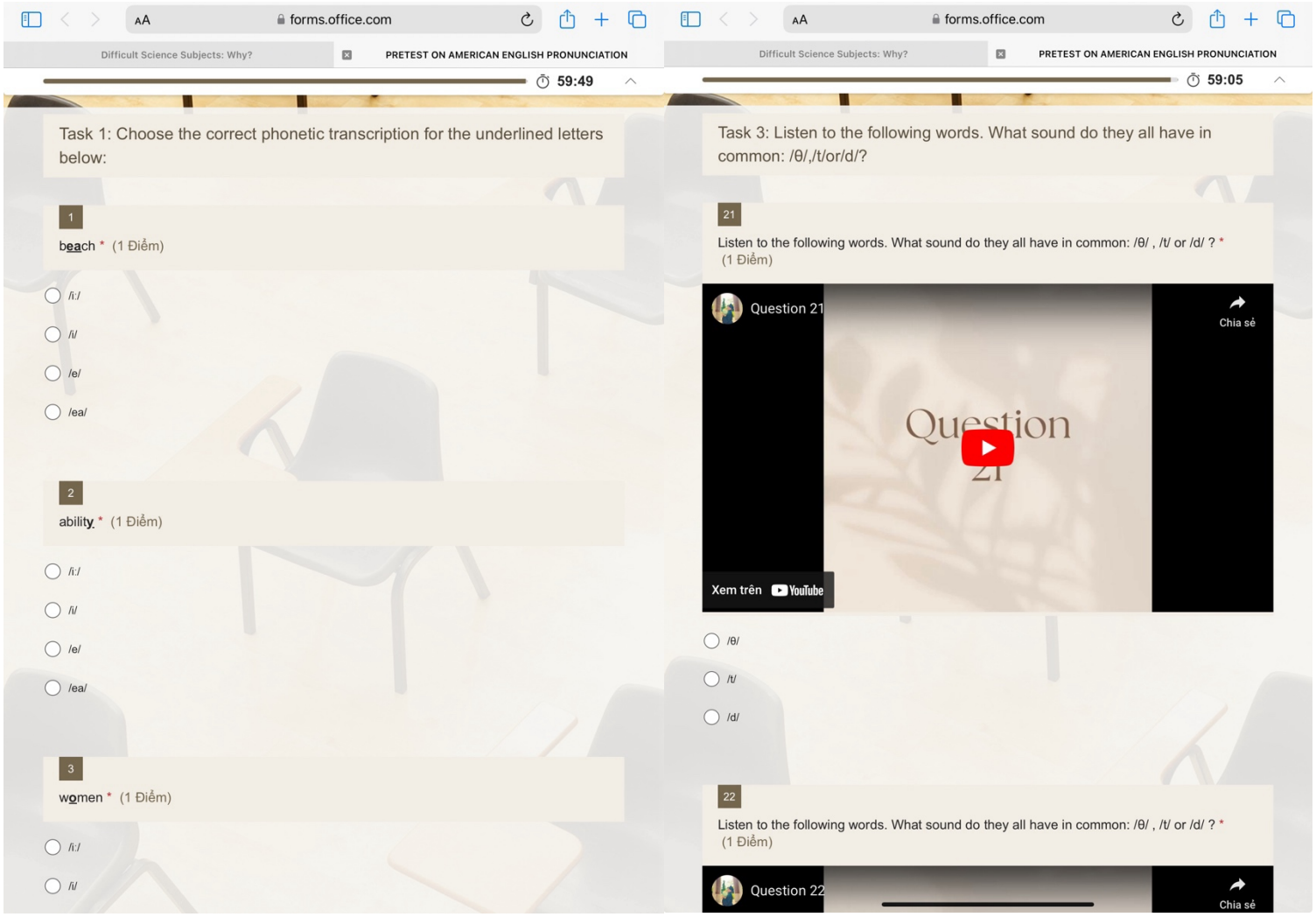
of L2 sound perception and the effectiveness of the MAPT apps, whereas the Questionnaire measured students' self-perception of improvement and their motivation and experience using those MAPT apps. The test includes different pronunciation features and common problems Vietnamese students have with American English pronunciation. The pretest was completed before the experiment began and the posttest was completed at the end of the experiment to measure improvement in sound perception. Both the control group and the experimental group took the pre- and posttest to find out if the use of MAPT apps had significantly contributed to the improvement in L2 sound perception or not. The pre- and posttest were conducted through MS form, which included recordings of the pronunciation of different words and different pronunciation activities to assess perceptions. It could be completed through their personal devices, including smartphones, tablets, laptop, or PC. The pretest was conducted on February 14$^{th}$ 2024 while the posttest was conducted on April 10$^{th}$ 2024. Both of the pre- and posttest were carried under supervision of teachers and teacher assistants at IDYLLISH.

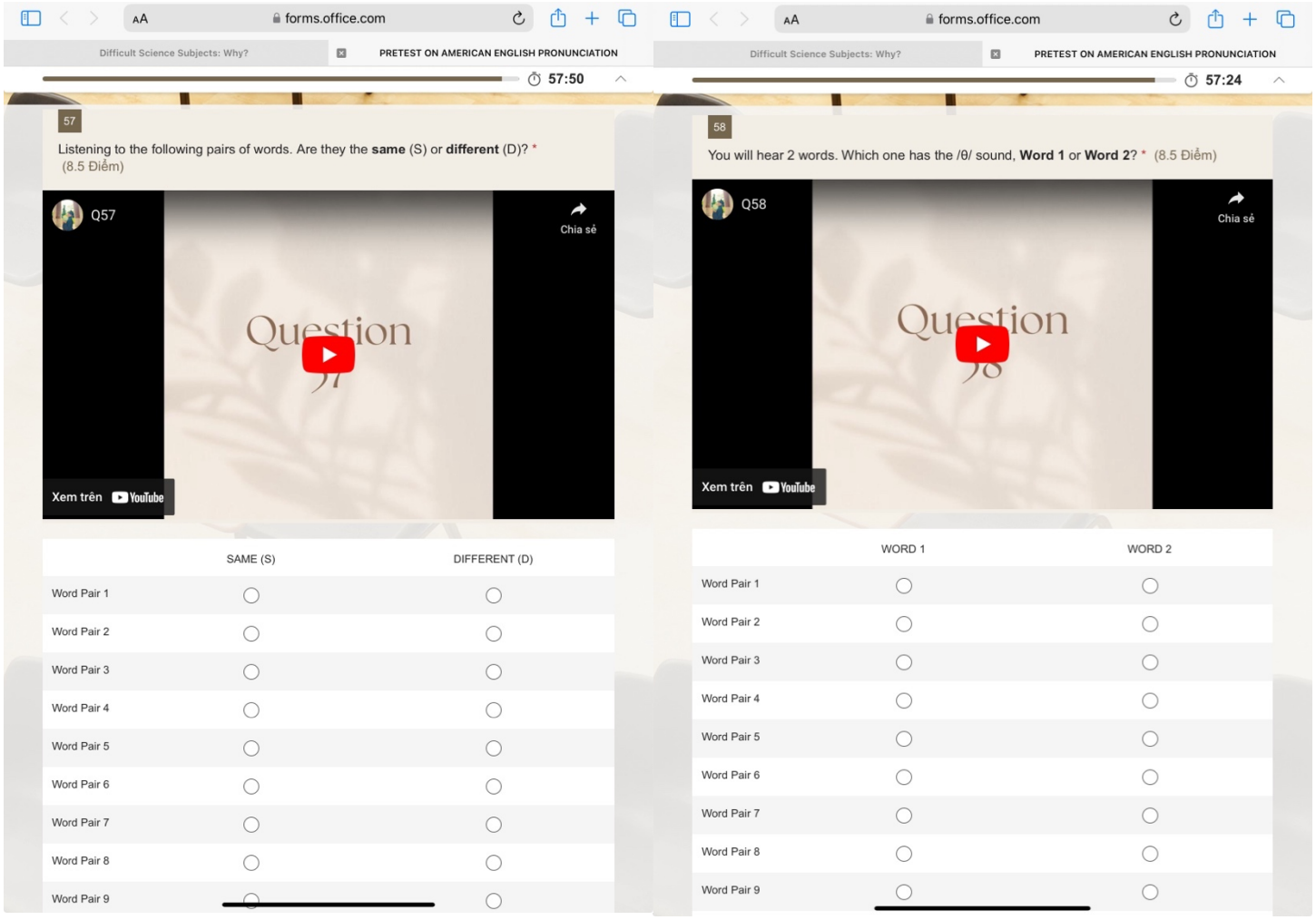
The pretest and posttest consisted of 10 tasks comprising 85 questions to be completed within a 60-minute time frame. These questions sets were devised based on the common mistakes made by Vietnamese English learners. Task 1 required participants to select the correct transcription for the given words. In Task 2, participants had to choose the word they heard from the audio. This task specifically tested students' perceptions of minimal pairs, homophones, and similar linguistic phenomena. In Task 3, participants had to listen to three words and identify the common sound among them. This task aimed to evaluate students' perceptions of these three particular consonant sounds /θ/, /t/ and /ð/. Similarly, Task 4 assessed the students' ability to distinguish between minimal pairs and similar-sounding words by asking participants to select the word that they heard from the audio recording. Task 5 was designed to assess participants'

perceptions of the following minimal pairs /g/ versus /k/, /ʃ/ versus /ʤ/, and /t/ versus /d/ and the following consonant clusters /rd/, /nd/, /nl/, /kt/, /st/, /rm/, /rn/, and /rt/ with different sounds and in different positions. Due to common difficulties with distinguishing minimal pairs /θ/ versus /d/, Task 6 and Task 7 were created to assess students' ability to identify the minimal pairs with consonant sounds like /θ/ versus /s/ and /θ/ versus /t/. Task 8 evaluated participants' perceptions of the /æ/ vowel sound, while Task 9 focused more on the /ð/ consonant sound. Finally, Task 10 assessed participants' ability to distinguish between the following minimal pairs /s/ versus /z/, /f/ versus /v/, and the "ds" cluster /z/ versus /dz/ with different sounds. Figure 6 below shows different screenshots with activities on sound perception created for the pre- and posttest.

**Figure 8.**

*Screenshots showing different activities on sound perceptions created for the pre- and posttest*


forms.office.com
Difficult Science Subjects: Why?
PRETEST ON AMERICAN ENGLISH PRONUNCIATION
59:49
Task 1: Choose the correct phonetic transcription for the underlined letters below:
1
beach * (1 Điểm)
/i:/
/i/
/e/
/ea/
2
ability * (1 Điểm)
/i:/
/i/
/e/
/ea/
3
women * (1 Điểm)
/i:/
/i/
forms.office.com
Difficult Science Subjects: Why?
PRETEST ON AMERICAN ENGLISH PRONUNCIATION
59:05
Task 3: Listen to the following words. What sound do they all have in common: /θ/,/t/or/d/?
21
Listen to the following words. What sound do they all have in common: /θ/ , /t/ or /d/ ? * (1 Điểm)
Question 21
Chia sẻ
Question 21
Xem trên YouTube
/θ/
/t/
/d/
22
Listen to the following words. What sound do they all have in common: /θ/ , /t/ or /d/ ? * (1 Điểm)
Question 22
Chia sẻ




On the other hand, the questionnaire was administered only to participants from the experimental group at the end of the experiment, and after using the two MAPT apps (*Mastering the American Accent* and *Speakometer*) autonomously. The questionnaire included a total of 34 questions, with 28 questions designed according to the 5-point Likert Scale style and 6 open-ended questions. These questions focused on attitudes and motivation towards the use of MAPT apps to improve English pronunciation, as well as their own self-perception on their actual experience using those MAPT apps. The 5-point Likert Scale style questions were categorized as follow (1) general statements on pronunciation training, (2) app usage, particularly of the *Mastering the American Accent* and *Speakometer*, (3) perceptions and attitudes, (4) challenges

and barriers, (5) motivations, (6) recommendations, and (7) conclusions on the use of those apps. This structure facilitates the qualitative analysis of the questionnaire results and allows researchers to identify the general pattern in students' answers. The last 6 open-ended questions attempted to ask them about their experiences, perceptions, and observations concerning the efficacy of the MAPT apps in improving their American English pronunciation. These questions were designed to provide researchers a comprehensive understanding of the effectiveness of these apps.

Moreover, this questionnaire was designed according to two fundamental principles, which are reliability and validity. The questionnaire is reliable because the number of questions is below 30 and therefore participants can avoid fatigue while taking it. It is also reliable because it includes several questions that tap into the same underlying construct. The questionnaire is valid because the questions are relevant and seek to measure students' motivations to use those apps and their own self-perception of improvement after using them. Besides, it is valid because it incorporates a mix of negative and positive statements to minimize the response biases.

The questionnaire of 34 questions will be sent out to the experimental group only at the end of the study, once they have used the MAPT apps. The questionnaire will include 28 statements on app usage, perception and attitudes, challenges and barriers when using the MAPT apps, students' motivation to use the MAPT apps, recommendations and final conclusions on the use of these MAPT apps. The last 6 questions will be open-ended asking them about their experiences, perceptions, and observations concerning the efficacy of the MAPT apps in improving their American English pronunciation. These inquiries are designed to provide researchers a comprehensive understanding of the effectiveness of these apps.

## 2.5 Procedure

This section reports on the procedure followed first to administer the pre and posttest and the questionnaire, and then to analyze the data collected using those tools.

### 2.5.1 Protocols for Administering the Pre- and Posttest and the Questionnaire

The pretest and posttest (see Appendix A) were administered to the experimental and control group for the quantitative analysis. The questionnaire (see Appendix B) was sent out to the experimental group at the end of the course for both quantitative and qualitative analysis.

The pretest/posttest, and questionnaire were designed on Microsoft Form (MS form). Each section of the pretest, posttest, and questionnaire was categorized in order to assess results more easily. All of these forms were shared to participants through a group chat on *ZALO*, which is a popular texting and calling application in Vietnam. The pre and posttest and the questionnaire were completely anonymously and later a number was assigned to each participant.

The pretest and posttest were carried out at the beginning and the end of the course with both the experimental and control group. The pretest was held online on February 14$^{th}$ 20204 with 40 candidates in 1 hour. The training course lasted 1.5 months, with 2 sessions per week, each lasting 2 hours. The experimental group used the recommended apps autonomously together with the instructional method in the classroom, whereas the control group was taught solely through instructional method in the classroom. At the end of the course, all students in both the experimental and the control group had to take the posttest (the same as the pretest) to assess students' performance and sound perception improvement after being trained either with the MAPT apps or in the classroom. The same procedure as in the pretest was repeated for the posttest which was conducted on April 10$^{th}$ 2024.

All collected data had to be analyzed and later underwent the process of triangulation to ensure the accuracy of data before final results can be derived.

### 2.5.2 Procedure for Data Analysis

A Paired Sample T-test was used to analyze the data and the difference between the results in the pretest and posttest, comparing the scores rated in each student and group (see Appendix C). Once the results were collected in the csv-format, they were sent to JASP by using the Repeated Measures ANOVA to compare the results of students' performance on L2 sound perception in both the experimental and control group.

For the analysis of quantitative data in the Questionnaire, descriptive statistics, frequency analysis and correlation analysis were used. Descriptive statistics were used to summarize and describe the tendencies, variability, and distribution of numerical data collected from closed-ended questions on participants' perception obtained from the Likert scale questions. Measures such as mean, median, mode, standard deviation, and range were calculated to provide a comprehensive overview of participants' perceptions and attitudes towards pronunciation apps. In addition, frequency analysis was conducted to examine the prevalence and distribution of categorical responses across different response options, shedding light on participants' app usage patterns and motivations. This involved counting the frequencies of each response category and visualizing the results. Furthermore, correlation analysis was performed to explore the potential relationships between variables and to identify patterns or associations between app usage frequency, perceived benefits, and overall satisfaction levels.

For the analysis of qualitative data in the 6 open-ended questions of the questionnaire, thematic analysis, content analysis, and the triangulation of quantitative and qualitative results were used. The qualitative approach was adopted to explore participants' opinion, experiences,

and perceptions about pronunciation training using MAPT apps in depth. Also, the thematic analysis was employed to identify recurring themes, patterns, and key insights emerging from participants' responses. This involved systematically coding the textual data and organizing it into categories or themes to uncover the underlying nuances and complexities of participants' experiences with pronunciation apps. Additionally, content analysis was used to examine the content of participants' responses and identify specific examples, challenges, and recommendations related to pronunciation practice. This allowed for a comprehensive exploration of participants' perceptions, attitudes, challenges, motivations, and recommendations regarding the use of pronunciation training apps. Last but not least, the triangulation of quantitative and qualitative data was conducted to integrate findings from both data sources and provide a comprehensive understanding of participants' experiences with MAPT apps. By combining insights from the quantitative analysis with in-depth qualitative exploration, it was possible to understand the factors influencing participants' perceptions and behaviors towards pronunciation training using MAPT apps.

# Chapter 3: Results

This chapter presents the statistical analysis of the results of the pretest and posttest using the repeated ANOVA measures through statistics program JASP, as well as the questionnaire using the Chi Square Goodness of Fit. The results from the pretest/posttest and the questionnaire were divided into two sections.

All 40 participants from both experimental and control group took the pre and posttest. However, there were only 13 participants from the experimental group completed the questionnaire. The questionnaire was sent out by the time the pronunciation training session with the experimental group was completed, which was on April 10th 2024. However, during this time, all teachers had to work on final exams for their classes and input their students' grades into the school system. 5 out of 20 teachers were head teachers, and they had to prepare all lesson plans and related documents for the checking process from educational inspectors from the National Institution of Vietnam. So, they did not submit their responses for the questionnaire. The other two teachers received the questionnaire through ZALO and saw the messages, but decided not to answer. Therefore, only 13 responses from the questionnaire were collected and ran through JASP in this study. Those who submitted their responses for the questionnaire completed all 28 Likert-scale and 6 open-ended questions.

## 3.1 Results of the Pretest/Postest

A parametric test, Repeated ANOVA specifically, was conducted in this study to compare how students from the experimental and control group performed in the pretest/posttest.

**Table 3**

*Repeated Measures ANOVA – Test performances*

Within Subjects Effects

| Cases | Sum of Squares | df | Mean Square | F | p | $\eta^2$ |
|---|---|---|---|---|---|---|
| Group | 1328.450 | 1 | 1328.450 | 7.935 | 0.011 | 0.244 |
| Residuals | 3181.050 | 19 | 167.424 | | | |
| Testing | 432.450 | 1 | 432.450 | 36.188 | < .001 | 0.079 |
| Residuals | 227.050 | 19 | 11.950 | | | |
| Group ∗ Testing | 88.200 | 1 | 88.200 | 9.044 | 0.007 | 0.016 |
| Residuals | 185.300 | 19 | 9.753 | | | |

*Note.* Type III Sum of Squares

A Repeated Measures ANOVA revealed that there was a statistically significant difference in the performances of 40 participants from two groups, F (1, 19) = 7.935, p = 0.011 with a small effect size. The *p* value for group p = 0.011 < 0.05, which is significant proving that there was an improvement in all 40 participants. Similarly, the *p* value for testing p < 0.01, which is significant. This proves that the methodologies used for both groups, experimental and control, were effective. In other words, the overall test results for both experimental and control groups improved.

**Table 4**

*Descriptive Statistics*

Descriptives

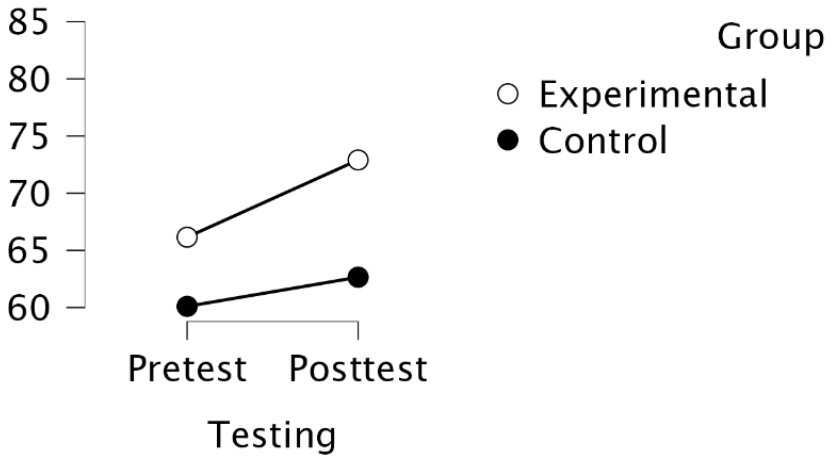
| Group | Testing | N | Mean | SD | SE | Coefficient of variation |
|---|---|---|---|---|---|---|
| Experimental | Pretest | 20 | 66.150 | 8.845 | 1.978 | 0.134 |
| | Posttest | 20 | 72.900 | 9.210 | 2.060 | 0.126 |
| Control | Pretest | 20 | 60.100 | 10.015 | 2.239 | 0.167 |
| | Posttest | 20 | 62.650 | 9.057 | 2.025 | 0.145 |

As can be seen from the descriptive table above (see Table 4), it is clear to see that the mean and standard deviations of results in the pretest of the experimental group was slightly higher than that of in control group (M = 66.150, SD = 8.845 compared to M = 60.100, SD =

10.015. On the other hand, the results of the experimental group in the posttest were considered much better, as the data went up remarkably from M = 66.150 to M = 72.900. The results of the control group also increased from M = 60.100, SD = 10.015 in the pretest to M = 62.650, SD = 9.057 in the posttest. Overall, an upward trend was witnessed in the performance of both groups.

**Figure 9.**

*Descriptive Plots*




Turning to the descriptive plot (see Figure 9), the overall results in the pretest and posttest of the experimental group was much higher than that of the control group. Specifically, while the majority of participants from the experimental group scored above 65 out of 100, those who from the control group scored lower, starting with 60. Both groups witnessed an upward trend in their overall performances in the posttest. That being said, the results indicate that with the support of the MAPT apps (*Mastering the American Accent* and *Speakometer*), participants can improve their perception in L2 pronunciation training. As indicated in the descriptive plot above, the results of the posttest in the experimental group surged, with the highest average score recorded ranging from 70 to 75. Similarly, the posttest results of the control group also improved, albeit with a lower score range.

**Table 5**

*Post Hoc Comparisons*

Post Hoc Comparisons - Group ✻ Testing

| | | | 95% CI for Mean Difference | | | | |
|---|---|---|---|---|---|---|---|
| | | Mean Difference | Lower | Upper | SE | t | $p_{tukey}$ |
| Experimental, Pretest | Control, Pretest | 6.050 | −2.609 | 14.709 | 2.976 | 2.033 | 0.208 |
| | Experimental, Posttest | −6.750 | −9.651 | −3.849 | 1.042 | −6.480 | < .001 |
| | Control, Posttest | 3.500 | −5.192 | 12.192 | 2.995 | 1.169 | 0.652 |
| Control, Pretest | Experimental, Posttest | −12.800 | −21.492 | −4.108 | 2.995 | −4.274 | 0.002 |
| | Control, Posttest | −2.550 | −5.451 | 0.351 | 1.042 | −2.448 | 0.085 |
| Experimental, Posttest | Control, Posttest | 10.250 | 1.591 | 18.909 | 2.976 | 3.444 | 0.012 |

*Note.* P-value and confidence intervals adjusted for comparing a family of 6 estimates (confidence intervals corrected using the bonferroni method).

In the post hoc comparisons, Tukey's HSD test for the multiple comparisons found that the mean value of the experimental pretest and experimental posttest was statistically significant different ($p < 0.001$, 95% C.I. = -9.651, -3.849). The result aligns with the aforementioned results from the descriptive statistics and descriptive plots, which showed that the students' performances in the experimental group improved significantly. The difference in the mean value of the control pretest and control posttest group was not significant, with $p = 0.085$ ($p > 0.05$), 95% C.I. = -2.550, -5.451.

## 3.2 Results of the Questionnaire Statements

This section focuses first on analyzing results of the Likert-scale questions in the questionnaire quantitative analysis and then on analyzing students' responses in the 6 open-ended questions at the end of the questionnaire. The Likert-scale questions were divided into sections to assess different aspects of participants' thoughts, perceptions, motivations, and recommendations of app use.

### 3.2.1 Descriptive Statistics Results from the Likert-scale Statements in the Questionnaire

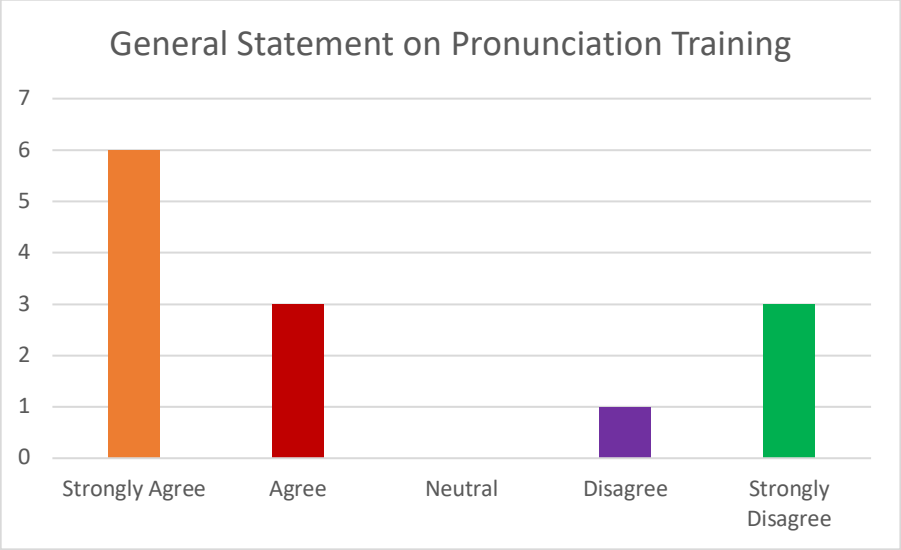
This section shows the results obtained from the Likert-scale statements in the questionnaire, and the percentages of responses for each statement.

#### 3.2.1.1 General Statements on Pronunciation Training

The questionnaire started with a general statement on pronunciation training (*I need to improve my English pronunciation*) to point out the need for pronunciation improvements.

**Figure 10.**

*General Statement on Pronunciation Training*




As can be seen from the bar chart, there were 6 out of 13 participants strongly agreed with the fact that they needed to improve their pronunciation. On the other hand, 3 people strongly disagreed and only 1 person disagreed with the need for pronunciation improvement. In other words, the majority of participants argued that pronunciation training was essential for them.

### 3.2.1.2 App Usage

The second set of statements in questionnaire was intended to ask participants about the usage of MAPT apps for their pronunciation enhancement. There are five statements shown as following (see Table 6):

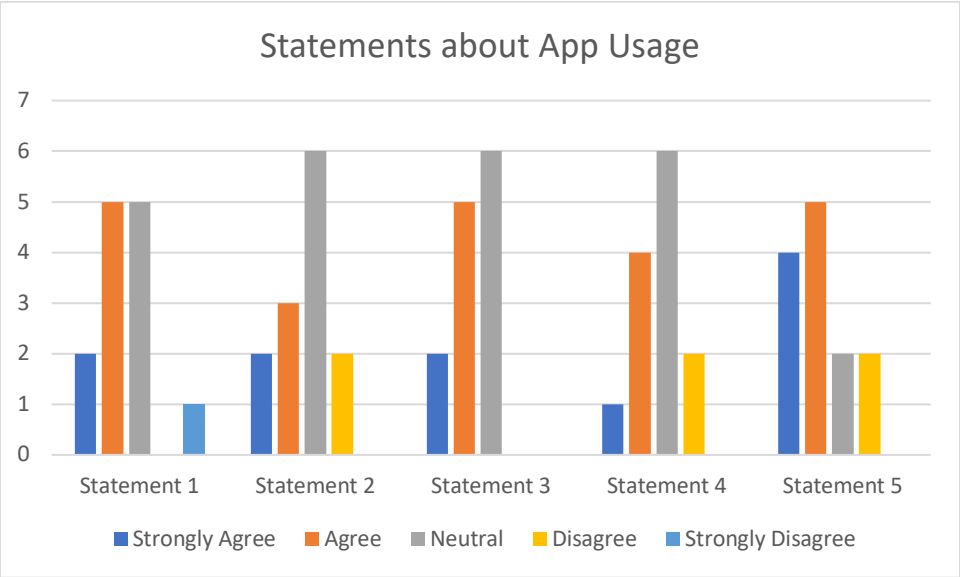
**Table 6**

*Statements from the Questionnaire asking about MAPT Apps Usage and How They were Coded to Run in JASP*

| | |
|---|---|
| **Statement 1** | I currently use mobile apps for improving my English pronunciation. |
| **Statement 2** | Pronunciation practice through free apps is a regular part of my language study routine. |
| **Statement 3** | I use pronunciation apps at least 4 hours per week. |
| **Statement 4** | *Mastering the American Accent* is the app I use more frequently. |
| **Statement 5** | *Speakometer* is the app I use more frequently. |

**Figure 11.**

*Responses for Statements from the Questionnaire asking about MAPT Apps Usage*



As can be seen from the bar chart, only one participant strongly disagreed with first statement, which asked about the current use of mobile apps for English pronunciation improvements. In contrast, 5 participants agreed and 2 participants strongly agreed with the statements. It is worth mentioning that 5 participants remained neutral regarding the given statement.

In the next two statements, the majority of participants were neutral (6 out of 13 participants in total), indicating that participants may not take pronunciation practice and the frequency of use seriously. Interestingly, more participants prefer using *Speakometer* over *Mastering the American Accent* apps (5 in comparison with 4 participants, respectively).

#### 3.2.1.3 Participants' Perceptions and Attitudes Towards Pronunciation Training

The third set of statements in questionnaire was intended to find out the participants' perceptions and attitudes towards the usage of MAPT apps for their pronunciation enhancement. The ten statements in the questionnaire are the following (see Table 7):

**Table 7**

*Statements from the Questionnaire asking about Participants' Perceptions and Attitudes on Pronunciation Training and How They were Coded to Run in JASP*

| | | |
|---|---|---|
| **Statement 1** | The free pronunciation apps I use are beneficial for improving my pronunciation. | ***Item 1*** |
| **Statement 2** | I find the specific features of these pronunciation apps not very helpful for improvement in sound perception. | ***Item 2*** |
| **Statement 3** | The pronunciation apps I use have significantly contributed to my overall improvement in sound perception. | ***Item 3*** |
| **Statement 4** | After using these apps, I find it easier to understand spoken English. | ***Item 4*** |
| **Statement 5** | I enjoy practicing pronunciation using free language apps. | ***Item 5*** |

| | | |
|---|---|---|
| **Statement 6** | I am not satisfied with the progress I've made in improving my pronunciation using free apps. | ***Item 6*** |
| **Statement 7** | Using these pronunciation apps helps me focus on specific sounds. | ***Item 7*** |
| **Statement 8** | I see a correlation between improved sound perception in English and increased confidence in speaking. | ***Item 8*** |
| **Statement 9** | Both the feedback and the explanations from pronunciation apps are valuable for my improvement. | ***Item 9*** |
| **Statement 10** | I am motivated to correct pronunciation errors when identified in those free apps. | ***Item 10*** |

In the following table of descriptive statistics (see Table 8), it is clear that the mean (M = 3.931) is high, which points out that the majority of participants agreed that the use of apps for pronunciation improvement is beneficial for them. This evidence was supported by skewness statistics (see Figure 12) and the statistics shown in the bar graph (see Figure 13), in which more people agreed with the statements provided, ranging from 8 to 9 participants. In addition to this, the standard deviation SD = 0.373 shows that there was no big difference among participants' answers. It is worth noting that statements 2 and 6 were negative (see Table 7), which means participants admitted the usefulness of the MAPT apps and they were satisfied with the experience.

**Table 8**

*Descriptive Statistics to Assess Participants' Perceptions and Attitudes Towards Pronunciation Training*

Descriptive Statistics

| | Item1 | Item2 | Item3 | Item4 | Item5 | Item6 | Item7 | Item8 | Item9 | Ietm10 | Section3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Valid | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| Missing | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Median | 4.000 | 4.000 | 4.000 | 4.000 | 4.000 | 4.000 | 4.000 | 4.000 | 4.000 | 4.000 | 4.000 |
| Mean | 4.231 | 3.692 | 3.923 | 4.154 | 3.923 | 3.462 | 3.923 | 4.154 | 4.077 | 3.769 | 3.931 |
| Std. Deviation | 0.599 | 1.109 | 0.641 | 0.555 | 0.760 | 1.127 | 0.641 | 0.376 | 0.494 | 0.599 | 0.373 |
| Skewness | −0.065 | −1.442 | 0.053 | 0.143 | 0.136 | −1.127 | 0.053 | 2.179 | 0.262 | 0.065 | −0.742 |
| Std. Error of Skewness | 0.616 | 0.616 | 0.616 | 0.616 | 0.616 | 0.616 | 0.616 | 0.616 | 0.616 | 0.616 | 0.616 |
| Kurtosis | 0.051 | 2.161 | 0.061 | 0.901 | −1.053 | 0.537 | 0.061 | 3.223 | 2.573 | 0.051 | 0.614 |
| Std. Error of Kurtosis | 1.191 | 1.191 | 1.191 | 1.191 | 1.191 | 1.191 | 1.191 | 1.191 | 1.191 | 1.191 | 1.191 |
| Minimum | 3.000 | 1.000 | 3.000 | 3.000 | 3.000 | 1.000 | 3.000 | 4.000 | 3.000 | 3.000 | 3.100 |
| Maximum | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 | 4.400 |

**Figure 12.**

*Histogram Assessing Participants' Perceptions and Attitudes Towards Pronunciation Training*

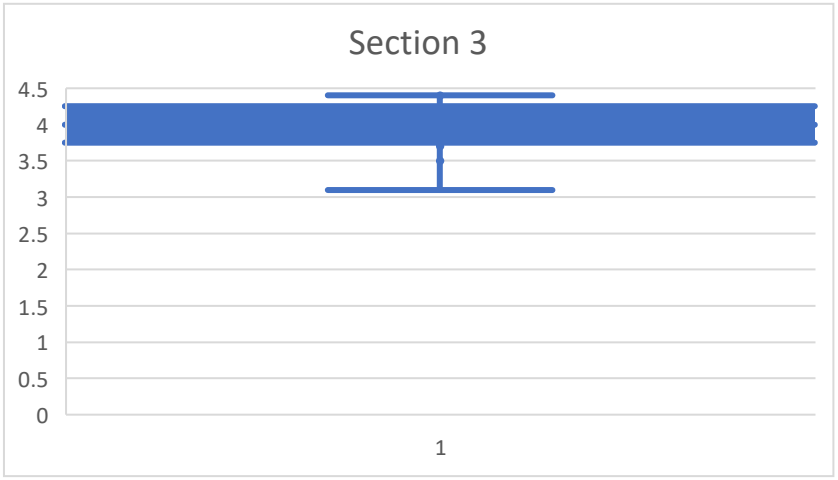
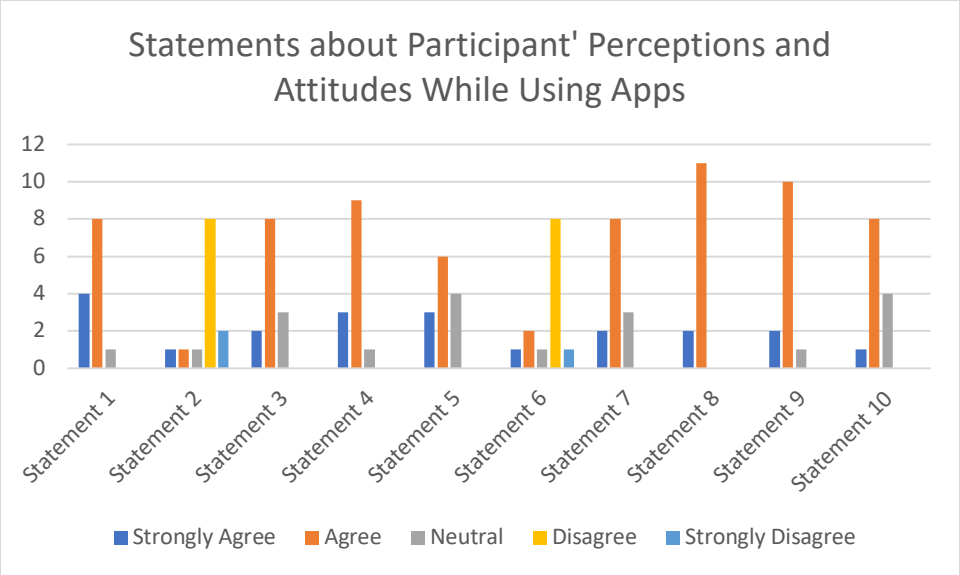



**Figure 13.**

*Responses for Statements from the Questionnaire asking about Participants' Perceptions and Attitudes Towards Pronunciation Training*




As observed from the bar graph showing the participants' responses on statements about their perceptions and attitudes towards pronunciation training (see Figure 13), 10 to 12 participants agreed that the pronunciation apps contributed significantly to their overall improvement in sound perception, allowing them to understand spoken English better. In addition to this, up to 12 participants strongly agreed that the free pronunciation apps are beneficial for their pronunciation improvement. Specifically, the apps helped them to focus on specific sounds thanks to the valuable feedback and explanations (with around 11 participants). Thanks to the effectiveness the apps provided, the majority of participants enjoyed the apps and were motivated to further use them in the future.

#### 3.2.1.4 Challenges and Barriers while Using Pronunciation Training Apps

In the fourth set of statements in questionnaire, the study aimed to point out the challenges and attitudes of participants when they used the MAPT apps to improve their pronunciation. There are four statements in total, which are the following (see Table 9):

**Table 9**

*Statements from the Questionnaire asking about Challenges and/or Barriers while Using Pronunciation Training Apps and How They were Coded to Run in JASP*

| | | |
|---|---|---|
| **Statement 1** | The explanations on sound differences in *Mastering the American Accent* were not clear enough. | ***Item 1*** |
| **Statement 2** | There are specific aspects of sound perception that I find difficult to improve using these pronunciation apps. | ***Item 2*** |
| **Statement 3** | Listening to the pronunciation of a native speaker and then recording my pronunciation on *Speakometer* was difficult. | ***Item 3*** |
| **Statement 4** | Despite advertisements, I find free apps for pronunciation training worth using. | ***Item 4*** |

Turning to challenges and barriers that participants encountered while using pronunciation training apps, it is clear from the descriptive statistics (see Table 10) that the mean statistics is M = 3.308, which points out that some participants faced issues while using apps such as complicated instructions or the apps' functions. This evidence was supported by both skewness statistics (see Figure 14), ranging from 3 to 3.5 (neutral); and the standard deviation SD = 0.384 proving that there was no big difference among participants' answers.

**Table 10**

*Descriptive Statistics to Assess Challenges and Barriers while Using the Pronunciation Training Apps*

Descriptive Statistics

| | Item1 | Item2 | Item3 | Item4 | Section4 |
|---|---|---|---|---|---|
| Valid | 13 | 13 | 13 | 13 | 13 |
| Missing | 1 | 1 | 1 | 1 | 1 |
| Median | 3.000 | 2.000 | 3.000 | 4.000 | 3.250 |
| Mean | 3.000 | 2.846 | 3.308 | 4.077 | 3.308 |
| Std. Deviation | 1.000 | 1.068 | 0.855 | 0.494 | 0.384 |
| Skewness | −1.182 | 0.838 | −1.651 | 0.262 | −0.292 |
| Std. Error of Skewness | 0.616 | 0.616 | 0.616 | 0.616 | 0.616 |
| Kurtosis | 1.036 | −0.705 | 3.765 | 2.573 | 0.678 |
| Std. Error of Kurtosis | 1.191 | 1.191 | 1.191 | 1.191 | 1.191 |
| Minimum | 1.000 | 2.000 | 1.000 | 3.000 | 2.500 |
| Maximum | 4.000 | 5.000 | 4.000 | 5.000 | 4.000 |

**Figure 14.**

*Histogram Assessing Challenges and Barriers while Using the Pronunciation Training Apps*

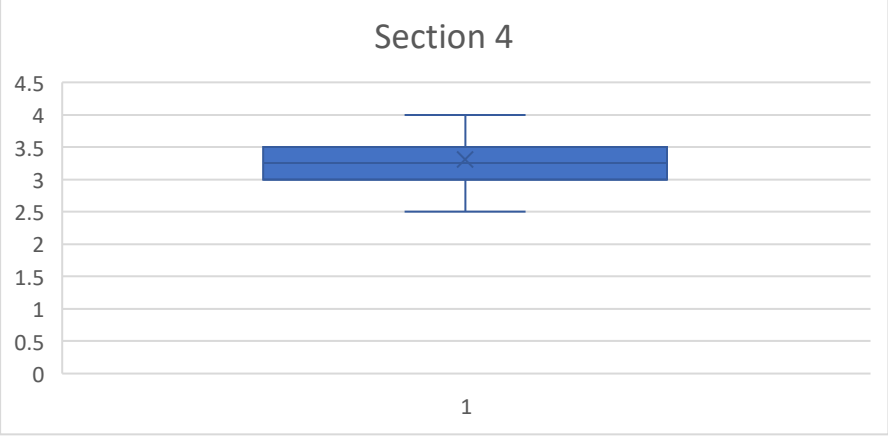
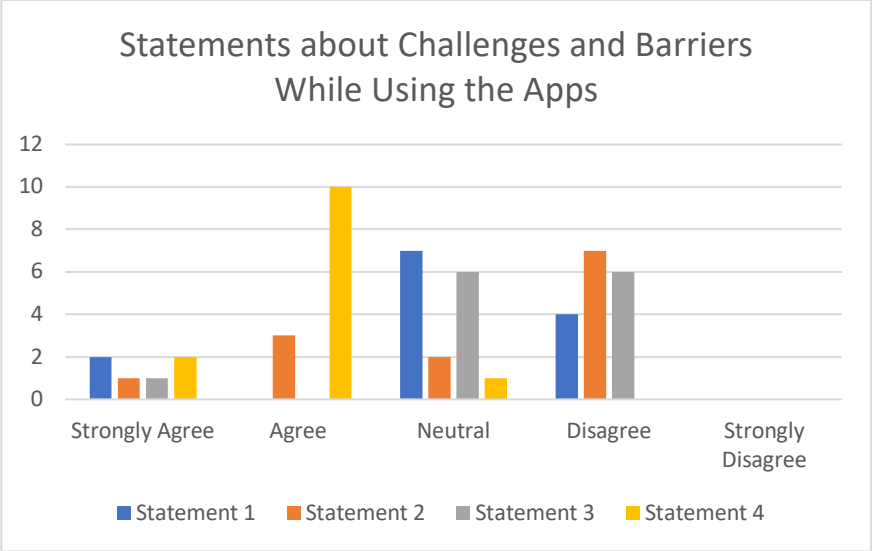



**Figure 15.**

*Responses for Statements from the Questionnaire asking about Challenges and Barriers while Using the Apps*




In the bar chart above (see Figure 15), there were 7 participants staying neutral with the first statement asking if the explanations on sound differences in the *Mastering the American Accent* were unclear. While 4 participants disagreed with this statement, only 2 participants found that the explanations from the app were hard to follow. Interestingly, there were 7 participants that found no difficult aspects of sound perception compared to 3 participants who did come across some difficulties. In the next statement about the functions of listening to native speakers and recording on *Speakometer*, there were 6 participants remained neutral and 6 participants disagreed with the fact that provided functions from the *Speakometer* app were difficult to use. Noticeably, up to 10 out of 13 participants still enjoyed using the free apps regardless of 30-second advertisements present in the *Mastering the American Accent*.

#### 3.2.1.5 Participants' Motivations to Use the Pronunciation Training Apps

The fifth set of statements aimed to see whether participants were motivated to use free MAPT apps to improve their pronunciation or not. There are four statements in total, which are the following (see Table 11):

**Table 11**

*Statements from the Questionnaire asking about Motivations Towards Pronunciation Training and How They were Coded to Run in JASP*

| | | |
|---|---|---|
| **Statement 1** | I am not motivated to use pronunciation apps for improvement. | ***Item 1*** |
| **Statement 2** | I am motivated to enhance my pronunciation skills using free apps. | ***Item 2*** |
| **Statement 3** | I feel motivated to continue working on my pronunciation using free apps. | ***Item 3*** |
| **Statement 4** | Using pronunciation training apps that are free is a huge motivation to use them. | ***Item 4*** |

From the descriptive statistics (see Table 12) assessing participants' motivations to use pronunciation apps, the mean statistics is M = 3.942, showing that participants agreed that they were motivated to use apps to improve their pronunciation proficiency. This evidence was aligned with the skewness statistics (see Figure 16) which ranged from more than 3.5 to 4.5. Moreover, the standard deviation SD = 0.480 pointed out that that participants' answers were almost identical towards these particular statements.

**Table 12**

*Descriptive Statistics to Assess Participants' Motivations to Use the Pronunciation Training Apps*

Descriptive Statistics

| | Item1 | Item2 | Item3 | Item4 | Section5 |
|---|---|---|---|---|---|
| Valid | 13 | 13 | 13 | 13 | 13 |
| Missing | 0 | 0 | 0 | 0 | 0 |
| Median | 4.000 | 4.000 | 4.000 | 4.000 | 4.000 |
| Mean | 3.615 | 4.000 | 4.154 | 4.000 | 3.942 |
| Std. Deviation | 1.044 | 0.707 | 0.555 | 0.913 | 0.480 |
| Skewness | −1.660 | −1.671 | 0.143 | 0.000 | −0.613 |
| Std. Error of Skewness | 0.616 | 0.616 | 0.616 | 0.616 | 0.616 |
| Kurtosis | 2.762 | 6.000 | 0.901 | −1.942 | −0.387 |
| Std. Error of Kurtosis | 1.191 | 1.191 | 1.191 | 1.191 | 1.191 |
| Minimum | 1.000 | 2.000 | 3.000 | 3.000 | 3.000 |
| Maximum | 5.000 | 5.000 | 5.000 | 5.000 | 4.500 |

**Figure 16.**

*Histogram Assessing Participants' Motivations to Use the Pronunciation Training Apps*

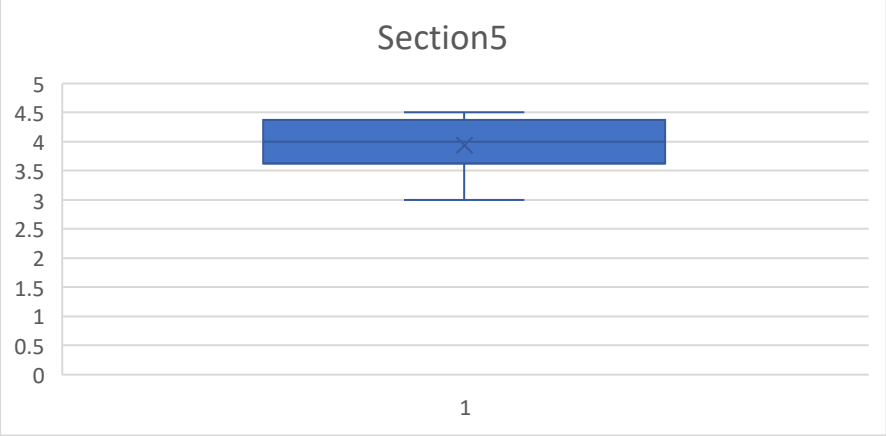



**Figure 17.**

*Responses to Statements from the Questionnaire asking about Motivations while Using the Apps*

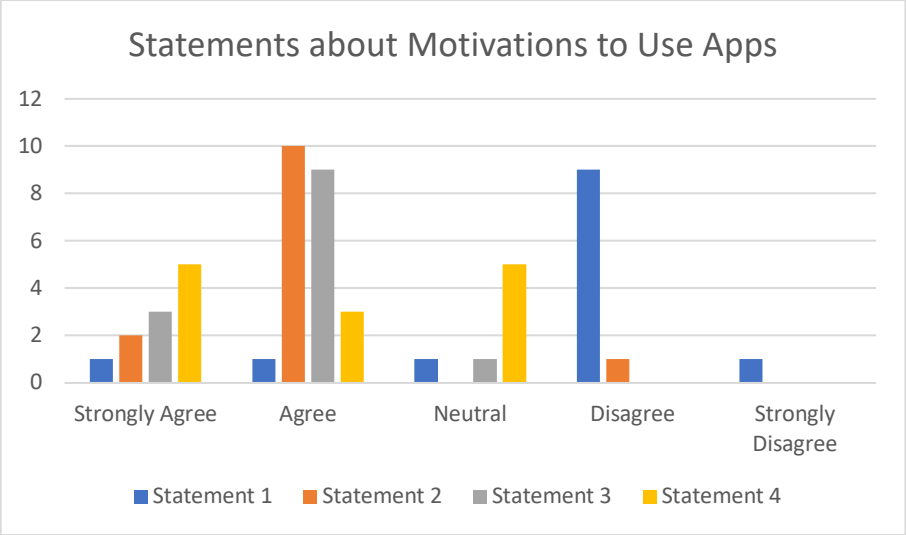



Figure 15 illustrates how participants responded to statements about motivations while using the apps. While there was only 1 participant who strongly agreed that he/she was not motivated to use apps for improvement, there were up to 7 participants that disagreed. In addition to this, up to 10 participants felt motivated to use apps to enhance their pronunciation skills. Similarly, 9 participants were motivated to continue working on their pronunciation using free apps. According to participants, the use of free apps is a huge motivation to continue using them for pronunciation enhancements, with 7 strongly agreed, 3 agreed, and 5 stayed neutral.

#### 3.2.1.6 Participants' Recommendations on the Use of Pronunciation Training Apps

The sixth set of statements has two statements asking participants if they would recommend the MAPT apps to their peers (see Table 13):

**Table 13**

*Statements from the Questionnaire asking If Participants Would Recommend the MAPT Apps and How They were Coded to Run in JASP*

| | | |
|---|---|---|
| **Statement 1** | I would recommend the pronunciation apps I use to my peers for improving English pronunciation. | ***Item 1*** |

| | | |
|---|---|---|
| **Statement 2** | I would not recommend practicing pronunciation using these apps because they are useless for pronunciation improvement | ***Item 2*** |

The descriptive statistics (see Table 14) assessed whether participants would recommend the two apps (*Mastering the American Accent* and *Speakometer*) to other people or not. As can be observed from the table, the mean statistics is M = 4.077 showing that participants would definitely recommend the apps to other people. The skewness statistics (see Figure 18) range was shifting to from 4 to 5, stating that the majority of participants showed agreements. Moreover, the standard deviation SD = 0.909 pointed that participants' answers were almost identical to these particular statements.

**Table 14**

*Descriptive Statistics to Assess Participants' Recommendations on the Use of Pronunciation Training Apps*

Descriptive Statistics

| | Item1 | Item2 | Section6 |
|---|---|---|---|
| Valid | 13 | 13 | 13 |
| Missing | 0 | 0 | 0 |
| Median | 4.000 | 4.000 | 4.000 |
| Mean | 4.077 | 4.077 | 4.077 |
| Std. Deviation | 0.954 | 1.256 | 0.909 |
| Skewness | −0.854 | −1.660 | −0.956 |
| Std. Error of Skewness | 0.616 | 0.616 | 0.616 |
| Kurtosis | 0.221 | 2.316 | 0.739 |
| Std. Error of Kurtosis | 1.191 | 1.191 | 1.191 |
| Minimum | 2.000 | 1.000 | 2.000 |
| Maximum | 5.000 | 5.000 | 5.000 |

**Figure 18.**

*Histogram Assessing Participants' Recommendations on the Use of Pronunciation Training Apps*

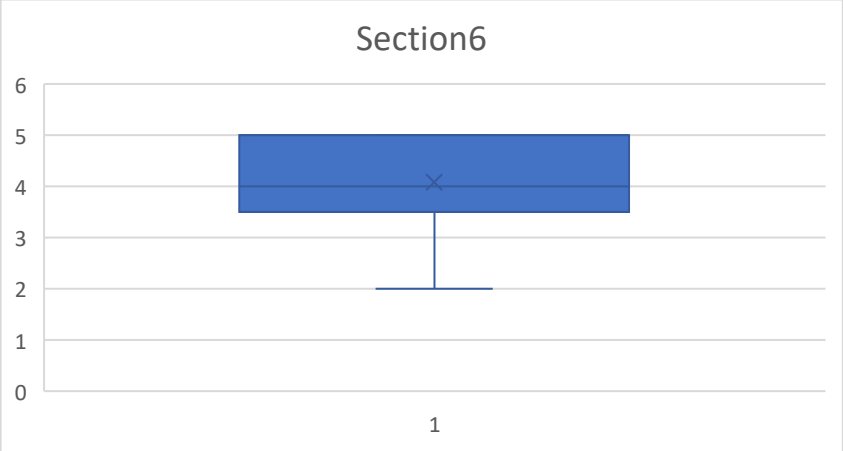
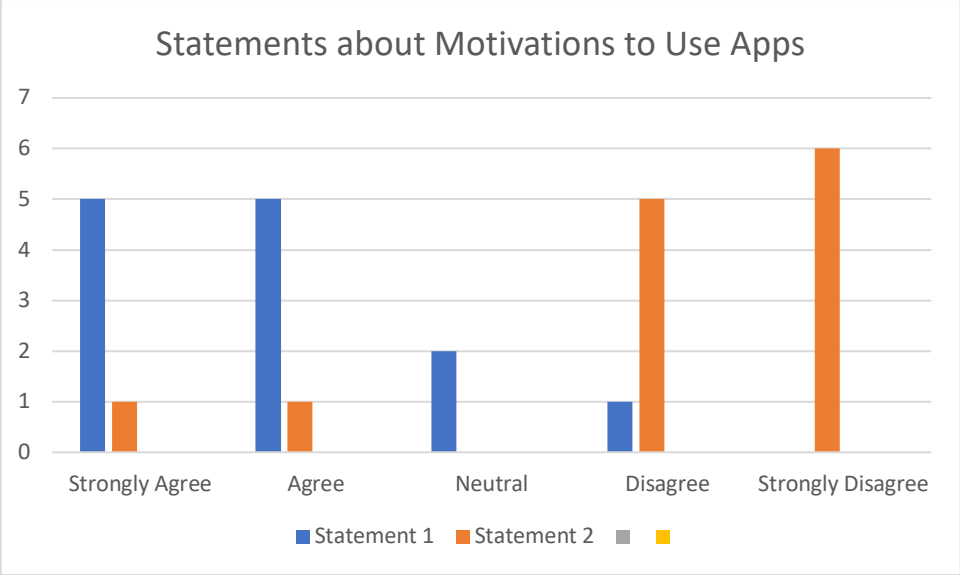



**Figure 19.**

*Responses for Statements from the Questionnaire asking about Recommendations*




The bar graph in Figure 19 gives information about the responses for statements asking about whether participants recommended the MAPT apps for their peers for further pronunciation improvement. Noticeably, in this section, the two statements are contradicted to guarantee the

validity of the questionnaire. The majority of responses was strongly agreed and agreed while 2 participants were neutral. There was only 1 participant that refused to recommend the apps to others. This was proved again by the number of responses in the second statement, which included no participants that would not recommend the apps.

#### 3.2.1.7 Participants' Conclusions

The seventh set of statements has two statements asking participants if they would recommend the MAPT apps to their peers (see Table 15):

**Table 15**

*Final Conclusions Statements from the Questionnaire and How They were Coded to Run in JASP*

| | | |
|---|---|---|
| **Statement 1** | Overall, my experience with free pronunciation apps has been positive. | ***Item 1*** |
| **Statement 2** | I will not continue using these free apps to improve my pronunciation. | ***Item 2*** |

The Table 16 and the histogram (see Figure 20) illustrate the final conclusions of participants towards the use of MAPT apps to enhance pronunciation ability. It is clear that the mean statistics (M = 4.077), the skewness statistics (ranging from 4 to 5), and the standard deviation (SD = 0.732) all pointed out that participants' experiences with apps were positive and that they would continue using the apps for further development.

**Table 16**

*Descriptive Statistics to Assess Participants' Recommendations on the Use of Pronunciation Training Apps*

Descriptive Statistics

| | Item1 | Item2 | Section7 |
|---|---|---|---|
| Valid | 13 | 13 | 13 |
| Missing | 0 | 0 | 0 |
| Median | 4.000 | 4.000 | 4.000 |
| Mean | 4.385 | 3.769 | 4.077 |
| Std. Deviation | 0.506 | 1.301 | 0.732 |
| Skewness | 0.539 | −1.109 | −0.311 |
| Std. Error of Skewness | 0.616 | 0.616 | 0.616 |
| Kurtosis | −2.056 | 0.290 | −0.906 |
| Std. Error of Kurtosis | 1.191 | 1.191 | 1.191 |
| Minimum | 4.000 | 1.000 | 3.000 |
| Maximum | 5.000 | 5.000 | 5.000 |

**Figure 20.**

*Histogram Showing Participants' Final Conclusions on the Use of Apps for Pronunciation Enhancement*

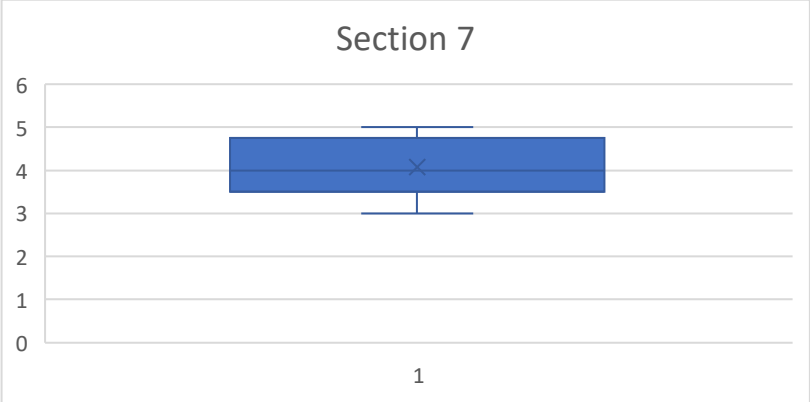



**Figure 21.**

*Responses for Statements from the Questionnaire asking about Recommendations*

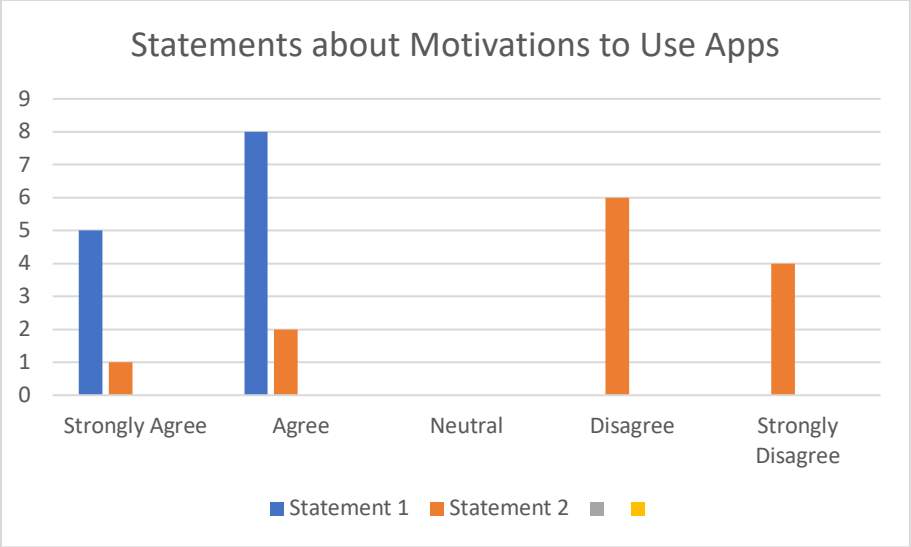



Figure 21 showcases the number of participants' final conclusions on the use of MAPT apps to improve their pronunciation. In statement 1, all participants' experiences with free apps were positive: 5 of them strongly agreed and up to 8 of them agreed. However, 3 out of 13 participants decided not to continue using those apps for further developments while the majority still used them (10 participants).

## 3.3 Results of the Questionnaire (Open-ended Questions)

These following sub-sections provide the overall results for the qualitative analysis of the 6 open-ended questions in the questionnaire (see Table 17). The 6 open-ended questions were grouped into 7 variables (see Table 18); note that in the first open-ended questions, there are two small questions. Then a set of categories were identified and analyzed.

**Table 17**

*Open-ended Questions in the Questionnaire*

| No. | Questions |
|---|---|
| 1 | How frequently do you use free pronunciation apps? Which free app do you use more frequently and why? |

| | |
|---|---|
| 2 | How would you describe your overall experience using free pronunciation improvement apps? |
| 3 | Have you noticed any changes in your perception of English sounds since incorporating free pronunciation apps into your learning process? |
| 4 | Can you share specific instances where you found those apps helpful or challenging for pronunciation practice? |
| 5 | Have you noticed any improvement in your English pronunciation while and after using free apps? |
| 6 | In what ways do you think these free pronunciation apps have influenced your language learning process? |

**Table 18**

*Categories Identified in the Open-ended Questions*

| No | Categories Identified | Items |
|---|---|---|
| 1 | Participants' App(s) Preferences | 1 |
| 2 | Participants' Frequency of Use of the MAPT App(s) | 1 |
| 3 | Participants' Overall Experience Using the MAPT App(s) | 1 |
| 4 | Changes in Perception of English Sounds While/After Using the MAPT Apps | 1 |
| 5 | Usefulness or Difficulties of the MAPT Apps for Pronunciation Practice | 1 |
| 6 | Participants' Overall Improvements While/After Using the MAPT Apps | 1 |

| | | |
|---|---|---|
| 7 | Influence of the MAPT Apps on Participants' Language Learning Process | 1 |
| **Total Questionnaire** | | **7** |

### 3.3.1 Participants' App(s) Preferences

The following bar chart (see Figure 22) demonstrates the number of responses on the participants' MAPT app preferences. Their specific responses were recorded under question 1 in Appendix D.

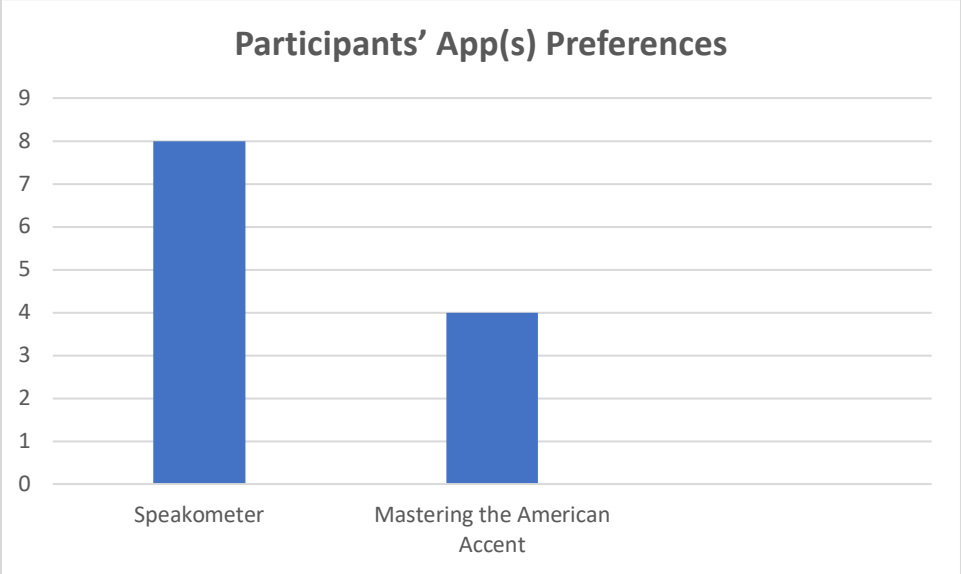
It is clear that participants preferred using *Speakometer* over *Mastering the American Accent*, 8 participants (A, B, D, F, G, I, J, and L) compared to 4 participants (B, C, D, and E), respectively. To be more specific, participants A, I, and J favored the *Speakometer* app because of the instant and detailed feedback provided by the AI speech recognition function. Also preferring the *Speakometer* app, participants E, F, and G said that this particular app was easy to use and follow. Participant L liked *Speakometer* because he thought that the *Mastering the American Accent* app was boring because it was "*a bit theoretical*."

On the other hand, participant B and D did not specify why they liked using the *Mastering the American Accent* while participant C directly stated that this app helped him/her fixing incorrect pronunciation errors. Participant E preferred the *Mastering the American Accent* because it was "*easy to follow*." It is worth noting that participants H and M did not provide any responses on app preferences.

Overall, despite the differences between both apps, the majority of participants highly valued the usefulness of both apps to improve their pronunciation and sound perception of L2.

**Figure 22.**

*Participants' App Preferences*




### 3.3.2 Participants' Frequency of Use of the MAPT App(s)

The bar chart down below (see Figure 23) presents information about how frequently participants from the experimental group used *Mastering the American Accent* and *Speakometer* to practice their pronunciation after class. Their specific responses were recorded under question 1 in Appendix D.

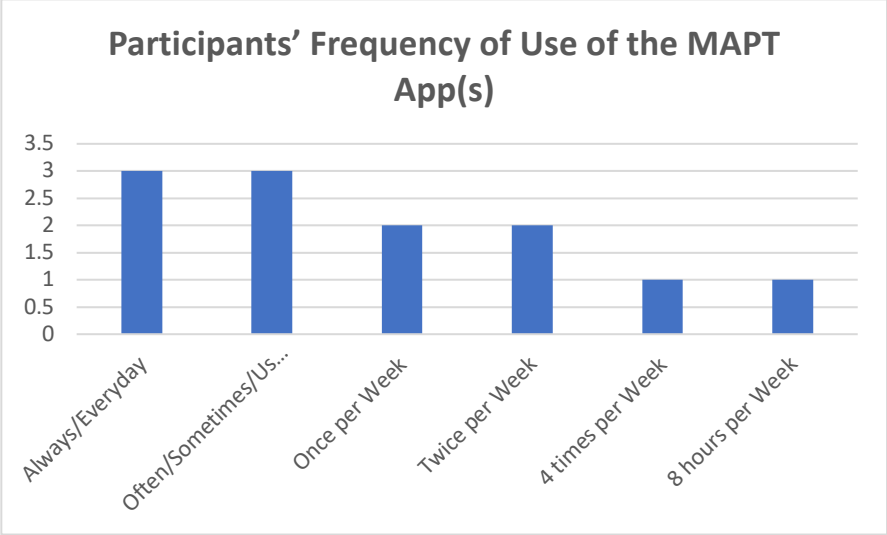
Participants A, B, and G said that they always used the MAPT apps to practice pronunciation or used those apps on a daily basis. Explaining for his/her response, participant A stated that he/she practiced and received instant feedback. Adding to this response, participant G preferred *Speakometer* over *Mastering the American Accent* because he/she was not interrupted by advertisements while using the app.

Similarly, participants J, K, L said that they often used those apps. Participant J agreed with what participant A stated on the instant feedback provided by the AI speech recognition of the *Speakometer* app. He/she also mentioned that practice activities from *Speakometer* were "*short*

*and practical*." Although participant L argued that it did not take him/her much time to practice on *Speakometer*, he commented that he found the *Mastering the American Accent* app was boring because it was "*a bit theoretical*." While participants E and H used the apps once a week, participants I and M used those apps twice a week. In other words, the number of participants who used those apps once or twice per week was identical. Participant C used the MAPT apps 4 times per week while participant F used up to 8 hours per week. It can be inferred that participant C and F had a more consistent practice compared to others.

**Figure 23.**

*Participants' App Use Frequency*

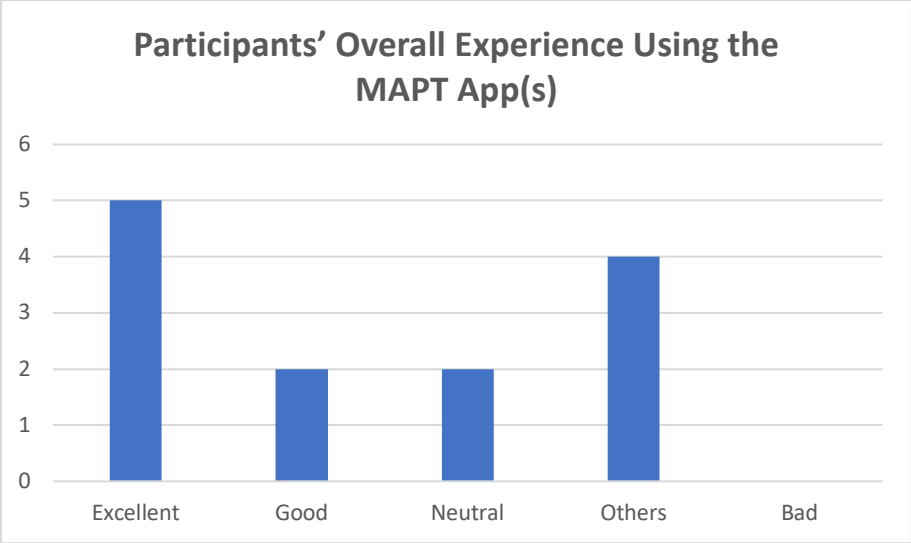



### 3.3.3 Participants' Overall Experience Using the MAPT App(s)

The bar graph (see Figure 24) shows the participants' overall experiences using the *Mastering the American Accent* and *Speakometer* apps for their pronunciation learning journey. Their specific responses were recorded under question 2 in Appendix D.

**Figure 24.**

*Participants' Overall Experience Using the MAPT Apps*




Obviously, there were 5 participants (Participants A, B, C, D, and L) who said that their experience was excellent. They also used other adjectives to describe their experience with the MAPT apps such as "*fantastic*", "*very useful*", and "*effective*." Interestingly, participants E and F said that the use of the MAPT apps had motivated them to practice their pronunciation. Participant F described his/her overall experience using the MAPT apps as "*positive because I now am more confident to speak in English than before. I can pronounce more clearly.*" In addition to this, there were 2 participants (Participants G and J) saying their experience with the MAPT apps was good thanks to the "detailed explanations from the *Mastering the American Accent* app" and the opportunities to revise and practice on *Speakometer*. This data was as same as those who stayed neutral (Participants H and K) and these participants did not specify the reasons behind their responses. Interestingly, none of the participants stated that their experience with the MAPT apps was bad.

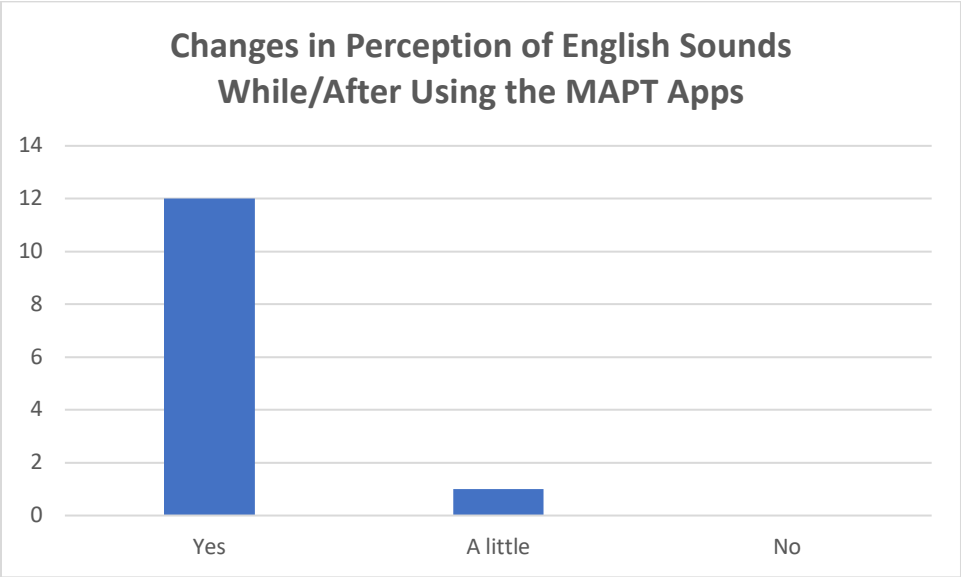
### 3.3.4 Changes in Perception of English Sounds While/After Using the MAPT Apps

The following bar chart (see Figure 25) demonstrates the changes in students' perceptions of the use of MAPT apps for pronunciation improvement while and after using two apps

*Mastering the American Accent* and *Speakometer*. Their specific responses were recorded under question 3 in Appendix D.

**Figure 25.**

*Changes in Participants' Perceptions*




This data set aligns with what was found in participants' responses about their overall experience while using the MAPT apps. Most of the participants argued that their perceptions had completely changed (up to 12 participants saying yes to the question), and they agreed that more attention should be paid to learning and improving pronunciation abilities (see Appendix D, question 3). Participant B explained that "*Before I didn't know what are vowels and consonants in English but now I know. I can also improve my pronunciation of words that were mispronounced before such as thought, math, basic, massage, etc.*" On the other hand, participants E and L said that after using the MAPT apps to practice they were able to distinguish and/or identify the sounds more easily. In a different scenario, participants F, G, I, and J commented that they were be able to improve common mistakes in English such as consonant clusters, ending sounds, vowel sounds, and some particular sounds including /θ/, /dʒ/, /s/, /ʃ/, /tʃ/, and /r/. However, only participant H

argued that only a small change was noticeable in his/her perception change. None of the participants denied the effectiveness of the MAPT apps contributing to their pronunciation learning journey.

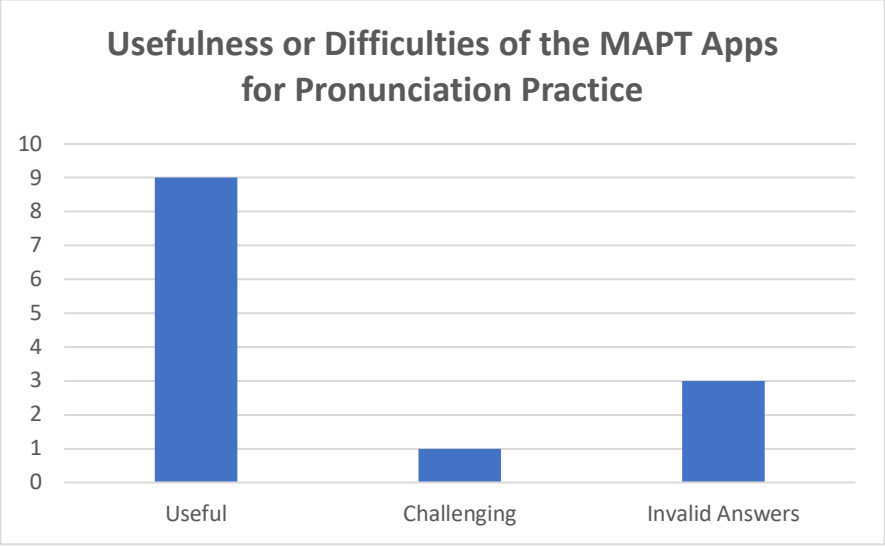
### 3.3.5 Usefulness or Difficulties of the MAPT Apps for Pronunciation Practice

The bar chart in Figure 26 indicates that a group of 9 out of 13 participants (Participants A, B, C, E, F, G, H, I, J, L) found the apps, *Mastering the American Accent* and *Speakometer*, were useful for them, especially in providing in-depth knowledge about English phonetic systems as well as serving as a tool to detect their pronunciation errors (see Appendix D, question 4). Participant B emphasized the use of AI in color-coding their pronunciation errors which helped him/her to improve. Both participants J and L complimented the combination of the learning theoretical content from the *Mastering the American Accent* app and the opportunities to practice what they had learned through the *Speakometer* app.

Notably, participant F found that the use of two apps were challenging due to the instruction and practice activities for consonant clusters.

**Figure 26.**

*Participants' Experience Using the Apps*



Unfortunately, there were three so-called invalid answers which the participants did not answer the given questions (see Table 19).

**Table 19**

*Participants' Responses that were Considered Invalid*

| **Question** | **Can you share specific instances where you found those apps helpful or challenging for pronunciation practice?** |
|---|---|
| Participant D | *Yes I can.* |
| Participant K | *Not now.* |
| Participant M | *Linking sounds.* |

In the case of participant D, he/she said that he/she could share specific instances, yet mentioned nothing. On the other hand, participant K did not provide any valid answer. Similarly, participant N mentioned "*linking sounds*", yet it is hard to know if he/she tried to categorize it as useful or challenging factors that the apps provided. Therefore, in this case, only 10 responses were valid to be analyzed.

### 3.3.6 Participants' Overall Improvements While/After Using the MAPT Apps

The sixth question asked participants whether they had noticed any improvements after they used the apps throughout their pronunciation training (see Figure 27). Their specific responses were recorded under question 5 in Appendix D.

Most of the participants shared that their pronunciation had improved. Specifically, participants B, F, L said that their intonation had improved significantly, which were no longer too high or too low. They also added that their pronunciation was more intelligible and produced with control (see Appendix D, question 5). Additionally, participant A said that he/she "*speak*

*clearer and more accurate*" while participant G received compliments on his/her pronunciation from his/her students. However, there was only 1 participant (Participant H) who argued that his/her improvement was not significant.

**Figure 27.**

*Participants' Improvements after Using Apps*

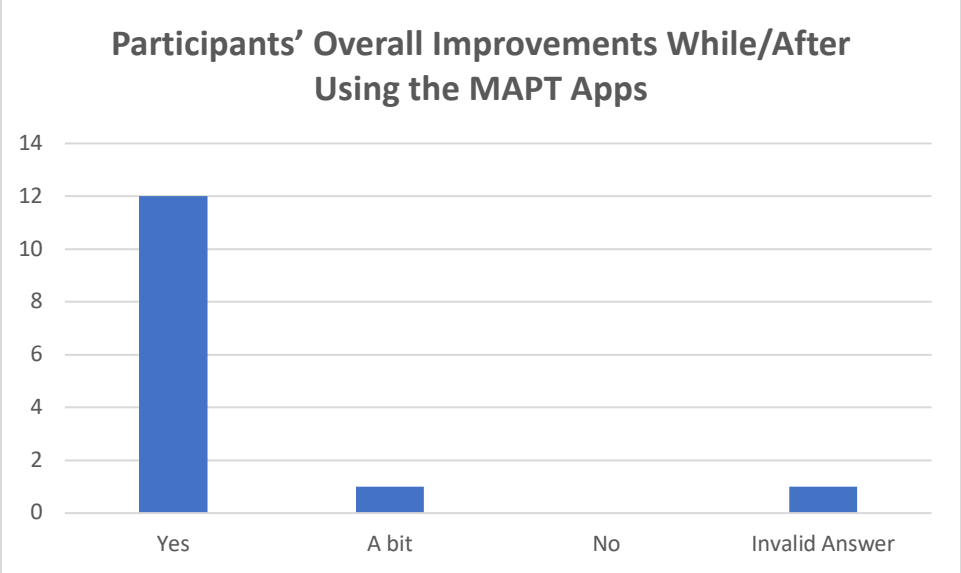



**Table 20**

*Participants' Responses that Were Considered Invalid*

| **Question** | **Have you noticed any improvement in your English pronunciation while and after using free apps?** |
|---|---|
| Participant F | *The way to show closed sounds when pronoun any English words. (Revised sentence: The way to produce closed sounds when pronouncing any English words.)* |

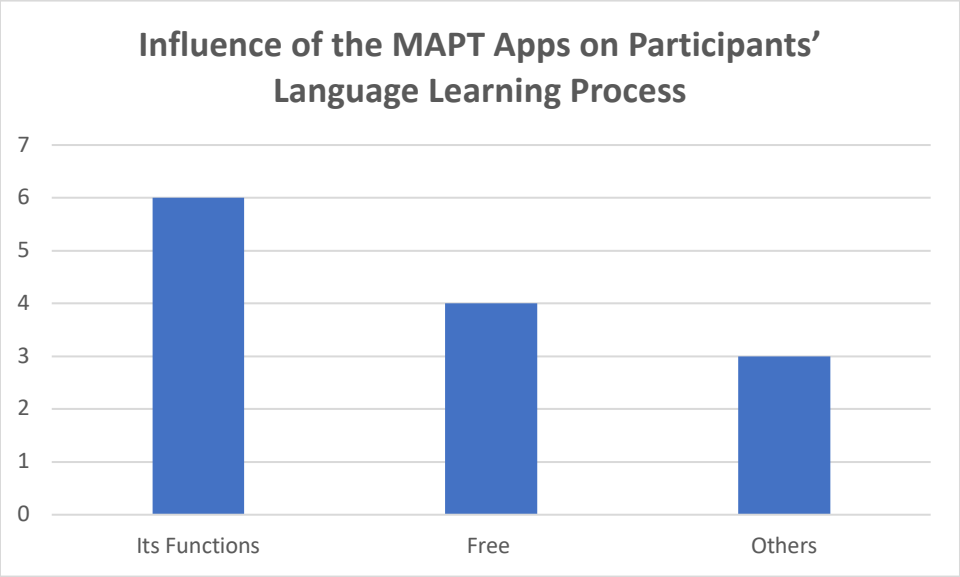
Also, there was 1 participant whose answer was not clear, so only 12 responses were counted.

### 3.3.7 Influence of the MAPT Apps on Participants' Language Learning Process

Finally, the bar chart below (see Figure 28) points out how language learning apps have actually influenced participants' overall learning process. Their specific responses were recorded under question 6 in Appendix D.

**Figure 28.**

*How Pronunciation Apps Influence Participants' Learning Process*




As indicated, 6 out of 13 participants (Participants A, B, C, E, G, L, specifically) stated that the functions of the two apps helped them to improve their pronunciation. These functions included the use of AI for pronunciation feedback in *Speakometer*, new vocabulary acquisition, the ease to follow instructions, and the possibility to practice anytime and anywhere. Interestingly, participant A mentioned that being able to practice pronunciation at home helps him/her to avoid being humiliated by other classmates. Meanwhile, participant B added that he/she could practice pronunciation with his/her children after class. There were 4 participants (Participants F, H, I, J) who claimed that they had used the apps because they are free.

Again, participant D did not answer the question (stated: speaking), making the response invalid for this particular question. However, it is possible to infer that maybe he/she found the MAPT apps had influenced him/her positively, especially on the speaking skill. Similarly, according to participant K, the pronunciation apps had influenced his/her learning process positively. This could be due to the benefits mentioned above. On the other hand, participant M stated that he/she could "*speak better English*" thanks to the MAPT apps. This statement is noteworthy because it shows that the MAPT apps not only help users to improve their sound perception of the L2 pronunciation but also has a significant impact on their production.

# Chapter 4: Discussion

In this chapter, the results obtained from the pre and posttest and the questionnaire are interpreted in relation to the two research questions and hypotheses posed in this study. Quantitative and qualitative results were triangulated to provide an understanding of participants' experiences with MAPT apps. Besides, the findings were also compared and related to similar studies discussed in the literature review, to show similarities and differences.

## 4.1 Important Findings

The purpose of the study is twofold. On the one hand, it aims to find out if the use of the apps *Mastering the American Accent* & *Speakometer* can help Vietnamese future teachers/students improves their L2 sound perception after using them for a certain period of time. On the other hand, this study also explores the students' own perception of their improvement after using those apps and their general experience using them. The research questions posed were:

RQ1: What is the impact of free MAPT apps (*Mastering the American Accent* & *Speakometer)* on the L2 sound perception of Vietnamese learners?

RQ2: To what extent do Vietnamese students perceive the use of free MAPT apps designed for American English pronunciation training as effective to improve their overall pronunciation?

### 4.1.1 RQ1 – Impact of MAPT Apps on L2 Sound Perception of Vietnamese Learners

This section discusses the most important findings in relation to research question 1 on the impact of using the MAPT apps to improve the L2 sound perception of Vietnamese learners. This section discusses the results obtained in the experimental group and compares them with the results of the control group. To answer research question 1, a discussion of quantitative and qualitative results in the experimental group is also presented.

#### 4.1.1.1 Quantitative Results: Pre and Posttest Results

The difference between the results of the pretest and posttest shows that the students in the experimental group significantly improved their L2 sound perception at the end of the treatment, which included specific training online using content from the two MAPT apps and students' own practice with the apps. The students in the control group also improved their sound perception a little bit. However, the results of the pretest and posttest in the control group were not so relevant despite the improvement. Therefore, the significant results obtained in the experimental group demonstrate the effectiveness of the MAPT apps (*Mastering the American Accent* and *Speakometer*) used in the study and their content to teach American pronunciation to Vietnamese learners. The results of the pre and posttest clearly support Hypothesis 1, which stated that the use of free MAPT apps would significantly improve the L2 sound perception of Vietnamese learners compared to the traditional instructional methods used in Vietnamese classrooms where little attention is paid to pronunciation.

#### 4.1.1.2 Qualitative Results: Open-Ended Questions

Some of the qualitative results obtained from the questionnaire administered to the experimental group also support Hypothesis 1. It can be inferred that the integration of the MAPT apps played a significant role in improving participants' pronunciation competency. This could be explained by the frequency of apps use during the intervention (question 29). Along with the online course taught on pronunciation using the apps, most of the participants spent their time practicing pronunciation on a daily basis proving that the apps' contents were effective for them to improve not only their perception but also their production in English. Even though there were participants using the apps only once or twice a week, the effectiveness of the apps still was felt in their overall performances in the posttest.

The MAPT apps truly made a positive influence on participants' learning process (questions 31, 33, and 34). As mentioned in their responses, it was the functions of the two apps that greatly helped them to improve their pronunciation. After comprehending the theoretical knowledge from *Mastering the American Accent*, participants turned to *Speakometer* for practice and the AI detected their pronunciation errors. Moreover, they also stated that they acquired new vocabulary sets thanks to the practice activities in both apps. Additionally, instructions in both apps were easy to follow, and participants had the possibility to practice anytime and anywhere. To sum up, the use of the MAPT apps (*Mastering the American Accent* and *Speakometer*) played a crucial role in improving not only the participants' perception of English pronunciation training but also their production of correct sounds, leading to a higher level of intelligibility.

### 4.1.2 RQ2 – Students' Perception and Attitudes Towards Pronunciation Training Using MAPT Apps

The section discusses the most important findings in relation to research question 2 on students' perceptions and attitudes towards pronunciation training using the MAPT apps and the contents of the apps for that training. This section discusses the results obtained in the questionnaire that the experimental group completed at the end of the treatment. To answer question 2, a discussion of the quantitative and qualitative results obtained from the questionnaire is presented.

#### 4.1.2.1 Quantitative Results: The Questionnaire

The statements about participants' perceptions and attitudes towards the MAPT training apps were mixed with negative and positive statements to ensure the validity and reliability of the questionnaire as well as the consistency in their responses. The majority of them strongly agreed that *Mastering the American Accent* and *Speakometer* are beneficial for pronunciation

improvement. Particularly, they agreed that they understood spoken English better and were able to focus on specific sounds to practice (statements 7-16). This was proven true in the next statement asking if they found any specific features of the pronunciation apps that were not helpful for improvement in sound perception. Most of them disagreed. In other words, there was a consistency in their responses about the benefits brought by the two apps. Participants also confirmed that the two apps made a great contribution to their overall pronunciation improvement, which was in line with the results in the posttest of the experimental group. They all said that they were satisfied with the progress they made in improving pronunciation (statements 9, 12, and 27), which allowed them to see the correlation between improving sound perception and increasing confidence in speaking (statement 14). Furthermore, according to the participants' responses in the open-ended questions 32 and 34, the majority of participants agreed that they enjoyed using the apps because these apps are free but still provided valuable feedback, which motivated them for further practice in the future. The responses collected from the questionnaire support Hypothesis 2 which states that Vietnamese students perceived the use of the MAPT apps as highly effective for their pronunciation training.

#### 4.1.2.2 Qualitative Results: Open-ended Questions

According to the participants' responses, their perceptions on L2 pronunciation training had changed significantly. After the treatment, they realized the importance of English pronunciation training, particularly in their jobs as teachers. They were also able to identify frequent errors in their own pronunciation and correct them using the theoretical aspects provided by the online course on pronunciation using *Mastering the American Accent* and the practical aspects from *Speakometer*. In other words, the use of MAPT apps did make a significant impact on changing the perception of Vietnamese learners in L2 pronunciation training. This change in

perception also contributed to the improvement of participants' pronunciation competency, according to their responses in question 31. Besides the enhancement of linguistic segmental aspects, participants' performances in suprasegmental features also had positive results. Particularly, their intonation had improved with more control, which was no longer too high or too low and had become more intelligible.

The majority of participants saying that they enjoyed using the apps for their pronunciation (question 30) improvement due to their functions, with the most votes belong to *Speakometer*, which is consistent with what they chose in the Questionnaire Likert-scale statements. The reason behind their choice is that *Speakometer* is easy to use. It was also equipped the instant color-coded feedback provided by AI feature in the *Speakometer* app. Although some people stated that they encountered some difficulties while listening and recording themselves using *Speakometer*, their experience with the app was still positive. Similarly, participants needed to watch a 30-ads on *Mastering the American Accent*, which was thought to be a bit annoying, however, most of the participants said that their overall experience with the app was still fine. Besides, both apps offer a myriad of practice exercises accompanied by native-speaker audio, allowing participants to review what they have learned and improve their pronunciation competency. Adding to this, the use of the MAPT apps in pronunciation training fostered autonomous learning as participants shared that they could practice their pronunciation whenever they want and they could even practice with their children. It is important to mention that the two apps used for this study also made an impact on participants' attitudes, which made them feel much more confident to practice pronunciation without being humiliated by their teachers or classmates. At the end, almost all participants said that they were motivated to know their errors detected by the apps and would definitely continue using these apps for further improvements. These responses to open-ended

questions (from 29-34) were in line with what the majority of responses to the statements in the Likert-scale questionnaire asking about app usage (statements 2-6), perceptions and attitudes (statements 7-16), motivations (statements 21-24), and conclusions (statements 27-28).

### 4.1.3 Triangulation of Quantitative and Qualitative Results

The impact of the MAPT apps used in the study has been positive for most participants in the experimental group. This has been reinforced by the final results of the experimental and control groups. The experimental group, which used the customized instructional materials excerpting from the *Mastering the American Accent* app, found that these resources saved them times and made the theoretical aspects of pronunciation easier to comprehend. The use of the *Speakometer* app, which granted pronunciation practice and feedback from the AI, also showed very positive results for the experimental when compared to those seen in the control group. Besides, in the questionnaire, participants from the experimental group reported that they were also able to identify their common pronunciation mistakes thanks to the AI feedback in the *Speakometer* app and correct them through the frequent practice on apps. They felt motivated because they did not have to pay anything to access the apps' contents. Most importantly, they felt much more confident in practicing pronunciation with the MAPT apps, particularly *Speakometer*, because they received instant feedback from the app without feeling judged by others.

The topic of incorporating MAPT apps in pronunciation training has gained widespread popularity among researchers and educators in order to come up with the so-called best apps for English learners to improve their pronunciation competency. Firstly, the results from this study align with what Nurwahida (2020), Fatimah (2021), Tan (2021), Haryadi and Aprianoto (2020), Rahmania (2021), and Zakiyyah et al. (2022) found in their experiments on the use of different

MAPT apps to improve students' pronunciation. Most participants in those studies showed an improvement in their pronunciation competency. While there were some issues related to technical issues, most participants agreed that the MAPT apps were still very reliable for learning and practicing pronunciation at their own pace. The results in previous studies also reinforce the findings in this study about the use of the two specific MAPT apps to foster autonomous learning.

Participants' generally positive attitudes towards the use of MAPT apps found in this study confirm previous findings by Miqawati (2020), Nurwahida (2020), Wongsuriya (2020), Rahmania (2021), Aratusa el al. (2022), and Salim (2023). All participants in this study agreed that they would continue using the apps and recommend them to others due to the use of authentic materials provided by the apps. Moreover, the inclusion of AI speech recognition (ASR) to detect learners' pronunciation errors, accompanied by various exercises for further practice, was highly appreciated by participants. Most importantly, learners felt confident making mistakes and correcting them without the fear of being humiliated by others.

The MAPT apps had made such a significant and positive impact on participants' performances. Participants in the studies of Nurwahida (2020), Rahmania (2021) and Salim (2023) stated that they all got to know more in-depth about their pronunciation errors and received proper training to understand different pronunciation features in American English. Improvements in those studies were reflected not only in participants' sound production but also in their perception of pronunciation training using the MAPT apps after the intervention. They all recognized the importance to enhance pronunciation for more intelligible sounds in speaking. These results aligned with the findings in this study, where the majority of participants in the experimental group stating that the apps' functions allowed them to strengthen their previous

knowledge about American English pronunciation as well as improve their pronunciation competency.

# Chapter 5: Conclusions

This study was inspired by the need to help Vietnamese teachers of English improve their pronunciation of American English and in turn help their own young learners. This is meant to create a knock-on effect that is believed to be beneficial for all Vietnamese learners While most studies on pronunciation improvement involved tertiary-level participants, this project focused mainly on Vietnamese English teachers working at primary, secondary, and high schools in Hanoi, Vietnam. This study posits that to improve Vietnamese students' overall pronunciation competencies, it is of utmost importance to first enhance their teachers' pronunciation abilities. The use of free MAPT apps like *Mastering the American Accent* and *Speakometer* was considered a possible solution to help English learners improve their L2 pronunciation with a focus on perception. It is expected that thanks to the use of these free MAPT apps, Vietnamese teachers will know exactly what and how to instruct their students to improve their pronunciation at no cost at all.

## 5.1 The Effectiveness of Apps for Pronunciation Training and Students' Perceptions on Them

The results from this study show that almost all participants acknowledged the urge to improve their pronunciation in certain aspects, usually identified in the literature as sound omission, sound confusion and sound redundancy (Ha, 2005), intonation and consonant cluster reduction (Nguyen & Dang, 2022).

Throughout this study, the use of MAPT apps in the experimental group has proven useful for learners to improve not only their L2 perception in pronunciation training but also their production up to a certain extent. Particularly, after participating in the online training course using the contents from the apps and using those apps on their own for practice, participants' overall

performances increased significantly. The difference between the pre and posttest demonstrate both the improvement and the impact MAPT apps have had on students' performances, therefore, confirming hypothesis 1 in this study. Similarly, the results of the questionnaire and the open-ended questions on students' perception of their improvement and attitude towards MAPT apps after using them, also confirmed hypothesis 2 in this study. Based on the responses collected from the questionnaire, the majority of participants praised these two apps, finding them useful and beneficial for them in their learning journey. Despite some challenges faced while using the MAPT apps, such as the Internet interruption or difficult lessons, participants still enjoyed using the apps thanks to a wide array of benefits they provided. These benefits include detailed explanations from the *Mastering the American Accent* app as well as from the instructor, the inclusion of AI errors detection from the *Speakometer* app, and the diversity of practice activities. These features foster autonomous learning and instill a sense of confidence in practicing American English pronunciation without fear of judgement from others. Notably, participants were able to observe their own improvements after the intervention, which eventually became one of their biggest motivations for further practice in the future, along with the free services of the apps. According to their responses from the open-ended questions in the questionnaire, participants stated that they would definitely recommend the use of MAPT apps, *Mastering the American Accent* and *Speakometer*, to others due to the positive experiences they had. This aligns with the results of Nurwahida (2020), Fatimah (2021), Tan (2021), Haryadi and Aprianoto (2020), Rahmania (2021), and Zakiyyah et al. (2022), who also reported the efficacy of the MAPT apps in improving learners' perceptions about English pronunciation as well as increasing the level of engagement in learning.

Moreover, the results support the notion that the main focus of pronunciation training with Vietnamese teachers/students should be on improving learners' perception first rather than focusing solely on production. After training the experimental group with the use of MAPT apps, participants have the tools to tackle the problem of fossilization of sounds and improve the pronunciation problems Vietnamese learners usually have. Thanks to the apps used in the experiment, they also stated that they now know how to produce sounds in more accurately and understand the exact positions of their tongues while producing American English sounds. This finding is in line with the results of similar experiments stated in previous studies, including Flege, John, and Jang (1997); Catford & Pisoni (2013); Lee, Plonsky, and Saito (2020); and Cibelli (2022). Focusing on sound perception can help learners discriminate and internalize new sounds, thereby avoiding L1 interference and leading to the noticeable improvements in all aspects of English pronunciation.

Lastly, the *Mastering the American Accent* and *Speakometer* apps are highly recommended in this study because they meet many of the criteria that make MAPT apps useful for pronunciation training. Firstly, they both contain high-quality contents that are detailed and helpful for learners to double-check theoretical contents and practice their pronunciation. Secondly, the design of both apps is user- friendly, with little or no difficulty in navigation. Thirdly, users can interact with AI speech recognition functions by recording and checking their pronunciation, which is believed to increase the level of engagement and ultimately their own production. Also, the practice section in *Speakometer* is personalized for users, providing practice activities based on the target sound(s) that learners want to improve. Besides, the *Speakometer* app also provides instant and personalized color-coded feedback, allowing learners to detect their errors and check with the instructions from the *Mastering the American Accent* app to correct them. Lastly, both of these apps are free, offering

learners lifelong pronunciation practice at no cost despite the presence of 30-second commercials in *Mastering the American Accent*, which students accept as a minor issue.

In conclusion, the use of MAPT apps is beneficial for Vietnamese teachers/students because it helps them improve their American English sound perception, leading to significant improvements in production. To optimize the functions of MAPT apps, Vietnamese teachers should provide knowledge and instructions in the form of pronunciation training that incorporates the contents of the apps to help students understand how sounds are produced in English and then encourage them to practice sound perception and production using the apps. Additionally, they should help students see the difference between Vietnamese and English sounds so that students can position their tongues correctly to produce accurate sounds. After that teachers can assign specific practice activities from the apps for students to practice at home and share their results from the *Speakometer* app. This will help teachers track students' learning progress and provide timely solutions when needed.

## 5.2 Limitations of the Study

Apart from the duration of the experiment, one of the biggest limitations of this research is the overall performance of the experimental group with the use of free MAPT applications. All of the participants are English teachers working in primary, secondary, or even high school; therefore, they skipped some online classes on pronunciation using the content of the apps. However, none of them dropped out from the course. Moreover, the amount of time spent on self-studying and practicing pronunciation with the two MAPT apps was considered insufficient because the participants had to work on lesson plans or prepare tests for their classes as well as other assigned tasks from their schools. Consequently, this affected their overall performance in the posttest even if it showed positive results. In addition to this, some participants did not finish

and/or do the questionnaire leading to the significant decrease in the number of responses collected, which was from 20 to 13 in total. Although reminder had been sent out twice to participants who did not finish and/or do the questionnaire, only 13 responses were collected.

## 5.3 Implications for Further Research

Additional research that could be conducted includes comparisons between other free MAPT applications available on the market. Currently, there has been a significant increase in the number of applications designed for learning English, particularly pronunciation. While there are some free applications, further research could examine applications that are affordable for users and still beneficial for them, such as *Cambly*, which provide learners many opportunities to interact with certified teachers. Additionally, more research could be devoted to investigate apps that provide platforms for learners to enhance both their perception in pronunciation training and self-study, incorporating a variety of gamifications to boost their understanding and memory.

Another area that could be considered for further research is the development of applications that not only focus on pronunciation perception but also incorporate the cultural and social factors. This study could delve into finding the best applications that enhance learners' basic perception of pronunciation training and provide authentic exposure to various pronunciation features, such as accent or dialects, from English speakers worldwide.

A third area requiring further study is the need for teacher training when incorporating MAPT apps to their classrooms. Although technology has been integrated in the teaching and learning classroom, teachers should be given more opportunities to access and receive instructions on how to use applications, whether free or paid by schools, to improve their teaching quality.

Last but not least, further studies could be carried out on the use of MAPT apps that incorporate cutting-edge technology such as the use of ultrasounds or MRI (Magnetic Resonance

Imaging) to help students, particularly Vietnamese, enhance their perceptions of pronunciation training. By doing this, Vietnamese students could be able to compare the sound productions between two languages leading to the improved production of English pronunciation.

# References


Akhmad, N. W., & Munawir, A. (2022). Improving the Students' Pronunciation Ability by Using Elsa Speak App. *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature*, *10*(1), 846-857. Retrieved from https://ejournal.iainpalopo.ac.id/index.php/ideas/article/view/2868

Anggraini, A. (2022). Improving Students' Pronunciation Skill Using Elsa Speak Application. *Journey: Journal of English Language and Pedagogy*, *5*(1), 135-141. **DOI:** https://doi.org/10.33503/journey.v5i1.1840

Aratusa, Z. C., Suriaman, A., Darmawan, D., Marhum, M., Rofiqoh, R., & Nurdin, N. (2022). Students' Perceptions on the Use of Mobile-Assisted Language Learning (MALL) in Learning Pronunciation. *International Journal of Current Science Research and Review*, *5*(7), 2652-2660. https://doi.org/10.47191/ijcsrr/V5-i7-50

Babekir, A. H. S. (2023). Speech Recognition and Pronunciation Apps and EFL Learners: A Study of Efficacy in Developing Speaking Skills. *Migration Letters*, *20*(S2), 883-893.

Burri, M. S. (2016). "*It's been a real eye opener": learning to teach English pronunciation from a teacher cognition perspective* [University of Wollongong]. https://ro.uow.edu.au/theses/4764

Catelly, Y. M. (2012). Towards Interlanguage Defossilizing-A Language Learning and Using Strategy Based Model. *Synergy*, (1), 7-20. https://doi.org/10.1016/j.system.2019.102185

Fatimah, S. (2021). The use of mobile-assisted language learning application in pronunciation training. *UG Journal*, *15*(4).

Flege, J. E., Bohn, O. S., & Jang, S. (1997). Effects of experience on non-native speakers' production and perception of English vowels. *Journal of phonetics*, *25*(4), 437-470. https://doi.org/10.1006/jpho.1997.0052

Haryadi Haryadi, S., & Aprianoto, A. (2020). Integrating "English pronunciation" app into pronunciation teaching: How it affects students' participation and learning. *Journal of Languages and Language Teaching*, *8*(2), 202-212. DOI: https://doi.org/10.33394/jollt.v%vi%i.2551

Jackson, J. L. (2016). The Importance Of Teaching Pronunciation. *Journal of Research and Pedagogy*, *2*, 121-129.

Kholis, A. (2021). Elsa speak app: automatic speech recognition (ASR) for supplementing English pronunciation skills. *Pedagogy: Journal of English Language Teaching*, *9*(1), 01-14. **DOI:** https://doi.org/10.32332/joelt.v9i1.2723

Lee, B., Plonsky, L., & Saito, K. (2020). The effects of perception-vs. production-based pronunciation instruction. *System*, *88*, 102185.

Luu, T. K. N. (2010). A brief comparison of Vietnamese intonation and English intonation and its implications for teaching English intonation to Vietnamese EFL learners. *VNU Journal of Foreign Studies*, *26*(3).

Mahmudah, L. (2015). An analysis of pronunciation exercises in duolingo application and its contribution as English learning media. *Unpublished. Retrieved from http://eprints. walisongo. ac. id/5059/1/113411023. pdf*.

Miqawati, A. H. (2020). Pronunciation Learning, Participation, and Attitude Enhancement through Mobile Assisted Language Learning (MALL). *English Review: Journal of English Education, 8*(2), 211-218. doi: 10.25134/erjee.v8i2.2118.

Nguyen, L. T., Hung, B. P., Duong, U. T. T., & Le, T. T. (2021). Teachers' and learners' beliefs about pronunciation instruction in tertiary English as a foreign language education. *Frontiers in Psychology*, *12*, 739842.

Nguyen, N. H., & Dang, N. V. (2022). Common Mistakes in English Speaking Affected by Vietnamese of Master of Business Administration at Tay Do University, in Vietnam. DOI: 10.47191/ijsshr/v5-i5-31

Nguyen, Q., & Duong, T. (2020, August 28). *Vietnamese students perform worst in English in national high school exam*. https://en.vcci.com.vn/vietnamese-students-perform-worst-in-english-in-national-high-school-exam

Nurwahida, N. (2020). Students' perceptions of mobile apps: A needs analysis of EFL learners. *International Journal in Applied Linguistics of Parahikma*, 54-67.

Pennington, M. C. (2021). Teaching pronunciation: The state-of-the-art 2021. *RELC Journal*, *52*(1), 3-21.

Phan, H. L. T. (2020). Vietnamese Learners' Attitudes Towards American and British Accents. *European Journal of English Language Teaching*, *6*(2).

Rahmadini, F., & Ramadhani, S. (2024). The Effectiveness of FluentU Application on Students' Vocabulary Mastery. *Journal of English Language Teaching*, *13*(1), 241-251.

Rahmania, A. H., & Mandasari, B. (2021). Students' Perception Towards The Use of JOOX Application to Improve Students' Pronunciation. *Journal of English Language Teaching and Learning*, *2*(1), 39-44.

Rifqiyah, A., Ardini, S. N., & Kusumo, A. B. P. (2021). "English pronunciation application" as a media to improve students' pronunciation: the effectiveness. *Linguistics and Education Journal*, *1*(1).

Robertson, P. (2003). Teaching English pronunciation skills to the Asian learner. A cultural complexity or subsumed piece of cake. *Asian EFL Journal*, *5*(2), 1-26.

Sholekhah, M. F., & Fakhrurriana, R. (2023). The Use of ELSA Speak as a Mobile-Assisted Language Learning (MALL) towards EFL Students Pronunciation. *JELITA: Journal of Education, Language Innovation, and Applied Linguistics*, *2*(2), 93-100. DOI: 10.37058/jelita.v2i2.7596

Tan, A. (2021). Study Intonation: A mobile-assisted pronunciation training application. *Teaching English as a Second Language Electronic Journal (TESL-EJ)*, *25*(3).

Van Van, H. (2010). The current situation and issues of the teaching of English in Vietnam. *立命館言語文化研究*, *22*(1), 7-18.

Wongsuriya, P. (2020). Improving the Thai Students' Ability in English Pronunciation through Mobile Application. *Educational Research and Reviews*, *15*(4), 175-185. DOI: 10.5897/ERR2020.3904

Zakiyyah, F., Setyaji, A., & Ardini, S. N. (2022, July). The analysis of pronunciation application based on the concept of Artificial Intelligence. In *UNCLLE (Undergraduate Conference on Language, Literature, and Culture)* (Vol. 2, No. 01, pp. 559-569).

# Appendices

## Appendix A

*Pretest and Posttest Used in the Study*

The purpose of this research is to gather relevant information about Vietnamese students' pronunciation of American English.

All participants in the experiment will have to complete this test on pronunciation in 60 minutes. The test is made up of 3 parts and 31 questions.

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**Task 1: Choose the correct phonetic transcription for the underlined letters below:**

1. b**ea**ch
   a. /iː/ b. /ɪ/ c. /e/ d. /ea/

2. abilit**y**
   a. /iː/ b. /ɪ/ c. /e/ d. /ea/

3. w**o**men
   a. /iː/ b. /ɪ/ c. /ʊ/ d. /u/

4. **A**pril
   a. /ai/ b. /e/ c. /ei/ d. /ea/

5. g**e**t
   a. /iː/ b. /ɪ/ c. /e/ d. /ae/

6. m**ea**sure
   a. /ea/ b. /e/ c. /e/ d. /iː/

7. **a**pple
   a. /e/ b. /a/ c. /ei/ d. /ae/

8. m**o**rning
   a. /ɑː/ b. /ʊ/ c. /o/ d. /ʌ/

9. l**ove**
   a. /o/ b. /u/ c. /ʌ/ d. /ʊ/

10. d**au**ghter
    a. /ɑː/ b. /ʊ/ c. /o/ d. /ʌ/

**Task 2: Listen to the following words and choose the one you hear in each audio:**

11. [boat]
    a. both b. boots c. boat d. bot

12. [pull]
a. pull b. pun c. put d. Paul

13. [wool]
a. world b. won c. wool d. wound

14. [swift]
a. sweet b. swift c. Swiss d. cannot identify

15. [third]
a. thirst b. thus c. third d. cannot identify

16. [five]
a. five b. find c. fine d. cannot identify

17. [join]
a. join b. joint c. joy d. cannot identify

18. [will]
a. win b. will c. whirl d. cannot identify

19. [island]
a. Ireland b. island c. highland d. cannot identify

20. [meant]
a. meant b. men c. man d. cannot identify

**Task 3: Listen to the following words. What sound do they all have in common: /θ/, /t/ or /d/ *?***
21. Think / Birthday / North
22. Thin / Author / South
23. Thank / Method / Teeth
24. Thief / Anything / Fourth
25. Thumb / Kathy / Bath

**Task 4: Choose the word you hear:**

| | | | |
|---|---|---|---|
| 26. lead | laid | led | lad |
| 27. beat | bait | bet | bat |
| 28. seal | sail | sell | Sal |
| 29. dean | Dane | den | Dan |

**Task 5: You will hear 2 words. Choose the one you hear:**

| | |
|---|---|
| pig / pick | bet / bed |
| back / bag | got / God |
| crow / grow | bolt / bold |
| class / glass | seat / seed |
| great / crate | ten / den |
| great / rate | heart / hard |
| rich / ridge | Fred /friend |
| choke / joke | met / meant |
| choice / Joyce | lad / land |

sad / sand
only / lonely
car / card
ask / asked
sitter / sister
foam / form
moaning / morning
pat / part
tone / torn
cone / corn

**Task 6: Listen to the following pairs of words. Are they the same (S) or different (D)?**

thin / sin
faith / faith
bath / bath
thing / sing
force / force
use / youth
thaw / saw
throw / throw
three / three
some / thumb
boat / boat
tick / thick
math / math
low / law
woke / walk
bought/bought
sell / sale
pen / pain
tell / tale
knees / needs

**Task 7: You will hear 2 words. Which one has the /θ/ sound, Word 1 or Word 2?**

think / sink
moss / moth
truth / truce
thin / sin
thank / sank
sought / thought
thick / sick
face / faith
worth / worse
force / forth
saw / thaw
bath / bass
use / youth
bath / bat
thank / tank
mat / math
boat / both
breath / breathe
team / theme
threw / true

**Task 8: Choose the one that has the /æ/ sound.**

flash / flesh
mean / man
salary / celery
ex / axe
taxes / Texas
send / sand

**Task 9: You will hear 2 words. Which one has the /d/ sound, Word 1 or Word 2?**

breathe / breed
their / dare
dose / those
day / they
worthy / wordy

**Task 10: You will hear 2 words. Choose the one you hear:**

place / plays
prize / price
loss / laws
sink / zinc
razor / racer
fan / van
save / safe
proof / prove
invest / infest
leaf / leave
fines / finds
cars / cards
fees / feeds
rise / rides
lens / lends
bills / builds

**Appendix B**

*Questionnaire Used in the Study*

| | Strongly Disagree 1 | Disagree 2 | Neutral 3 | Agree 4 | Strongly Agree 5 |
|---|---|---|---|---|---|
| **General Statements on Pronunciation Training** | | | | | |
| 1. I need to improve my English pronunciation. | | | | | |
| **App Usage** | | | | | |
| 2. I currently use mobile apps for improving my English pronunciation. | | | | | |
| 3. Pronunciation practice through free apps is a regular part of my language study routine. | | | | | |
| 4. I use free pronunciation apps at least 4 hours per week. | | | | | |
| 5. *Mastering the American Accent* is the app I use more frequently. | | | | | |
| 6. *Speakometer* is the app I use more frequently. | | | | | |
| **Perceptions and Attitudes** | | | | | |
| 7. The free pronunciation apps I use are beneficial for improving my pronunciation. | | | | | |
| 8. I find the specific features of these pronunciation apps not very helpful for improvement in sound perception. | | | | | |
| 9. The pronunciation apps I use have significantly contributed to my overall pronunciation improvement. | | | | | |
| 10. After using these apps, I find it easier to understand spoken English. | | | | | |
| 11. I enjoy practicing pronunciation using free language apps. | | | | | |
| 12. I am not satisfied with the progress I have made in improving my pronunciation using free apps. | | | | | |
| 13. Using these pronunciation apps helps me focus on specific sounds. | | | | | |
| 14. I see correlation between improved sound perception in English and increased confidence in speaking. | | | | | |
| 15. Both feedback and the explanations from pronunciation apps are valuable for my improvement. | | | | | |
| 16. I am motivated to correct pronunciation errors when identified. | | | | | |
| **Challenges and Barriers** | | | | | |
| 17. The explanations on sound differences in *Mastering the American Accent* were not clear enough. | | | | | |
| 18. There are specific aspects of sound perception that I find difficult to improve using these pronunciation apps. | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 19. Listening to the pronunciation of a native speaker and recording my pronunciation on *Speakometer* was difficult. | | | | | |
| 20. Despite advertisements, I find free apps for pronunciation training worth using. | | | | | |
| **Motivations** | | | | | |
| 21. I am not motivated to use pronunciation apps for improvement. | | | | | |
| 22. I am motivated to enhance my pronunciation skills using free apps. | | | | | |
| 23. I feel motivated to continue working on my pronunciation using free apps. | | | | | |
| 24. Using pronunciation training apps that are free is a huge motivation to use them. | | | | | |
| **Recommendations** | | | | | |
| 25. I would recommend the pronunciation apps I use to my peers for improving English pronunciation. | | | | | |
| 26. I would not recommend practicing pronunciation using these apps because they are useless for pronunciation improvement. | | | | | |
| **Conclusions** | | | | | |
| 27. Overall, my experience with free pronunciation apps has been positive. | | | | | |
| 28. I will not continue using these free apps to improve my pronunciation. | | | | | |
| **OPEN-ENDED QUESTIONS** | | | | | |
| 29. How frequently do you use free pronunciation apps? Which free apps do you use more frequently and why? | | | | | |
| 30. How would you describe your overall experience using free pronunciation improvement apps? | | | | | |
| 31. Have you noticed any changes in your perception of English sounds since incorporating free pronunciation apps into your learning process? | | | | | |
| 32. Can you share specific instances where you found those apps helpful or challenging for pronunciation practice? | | | | | |
| 33. Have you noticed any improvement in your English pronunciation while and after using free apps? | | | | | |
| 34. In what ways do you think these pronunciation free apps have influenced your language learning process? | | | | | |

## Appendix C

*Participants' Performances in the Pretest and Posttest*

| Participants | ExPre | ExPost | Participants | ControlPre | ControlPost |
|---|---|---|---|---|---|
| 1 | 58 | 73 | 21 | 76 | 74 |
| 2 | 68 | 74 | 22 | 50 | 58 |
| 3 | 70 | 79 | 23 | 59 | 59 |
| 4 | 67 | 77 | 24 | 61 | 69 |
| 5 | 59 | 64 | 25 | 60 | 64 |
| 6 | 80 | 82 | 26 | 62 | 69 |
| 7 | 68 | 75 | 27 | 58 | 64 |
| 8 | 72 | 76 | 28 | 71 | 71 |
| 9 | 71 | 80 | 29 | 64 | 67 |
| 10 | 72 | 78 | 30 | 40 | 45 |
| 11 | 65 | 78 | 31 | 57 | 59 |
| 12 | 64 | 70 | 32 | 57 | 56 |
| 13 | 58 | 69 | 33 | 69 | 72 |
| 14 | 45 | 47 | 34 | 61 | 64 |
| 15 | 80 | 78 | 35 | 65 | 65 |
| 16 | 80 | 82 | 36 | 68 | 57 |
| 17 | 67 | 76 | 37 | 35 | 40 |
| 18 | 59 | 64 | 38 | 63 | 68 |
| 19 | 56 | 55 | 39 | 54 | 57 |
| 20 | 64 | 81 | 40 | 72 | 75 |

**Appendix D**

*Participants' Responses for the Open-ended Questions from the Questionnaire*

*Question 1*

| **Question 1** | **How frequently do you use free pronunciation apps? Which free app do you use more frequently and why?** |
|---|---|
| Participant A | *I use it almost every day after work. Personally, I like Speakometer because I can practice and receive instant feedback, which I think is very useful* |
| Participant B | *I always use Mastering of American Accent and Speakometer to improve my English pronunciation, especially after I take classes with Sang* |
| Participant C | *4 times per week, mater english ... because it helps me to fix my wrong pronunciation* |
| Participant D | *Wonderful. Two free apps are Mastering the American Accent and Speakometer* |
| Participant E | *Maybe Once a week. They are Mastering the American Accent and Doulingo because they are easy to follow* |
| Participant F | *About 8 hours a week because I have classes to teach. But I try to practice after every lesson. Personally I prefer Speakometer to American Mastering Accent because it is easier to use* |
| Participant G | *I use free pronunciation free apps every day with my sons. I like Speakometer because it is easy to use. There is no advertisement so it easy to use* |
| Participant H | *once a week* |
| Participant I | *I use apps twice a week. I favor Speakometer because it gives me feedback. However, most of the functions are not free.* |
| Participant J | *I often use them. Personally, I like speakometer because it gives me detailed feedback. The practice activities or short and practical.* |
| Participant K | *sometimes/ dualingo* |

| | |
|---|---|
| Participant L | *I usually use Speakometer because it doesnt take a lot of time to use. Another app is american accent is a bit theoretical so sometimes i feel a bit boring* |
| Participant M | *Twice a week* |

*Question 2*

| **Question 2** | **How would you describe your overall experience using free pronunciation improvement apps?** |
|---|---|
| Participant A | *My learning experience using apps is fantastic. I can have a better idea of my pronunciation errors and can practice to improve it* |
| Participant B | *It's very useful to me because it provides me an insightful knowledge to understand how to produce a certain sound. Sometimes the advertisements are bit annoying but overall it was good* |
| Participant C | *i pronounced and recorded it, these apps would give me score which helped me realize my fault and fix it* |
| Participant D | *excerlent* |
| Participant E | *They have motivated me a lot.* |
| Participant F | *It is positive because I now am more confident to speak in English than before. I can pronounce more clearly* |
| Participant G | *My overall experience using free pronunciation improvement apps is good. The instruction from the american app is very clear and detailed. I can practice what I learn on Speakometer* |
| Participant H | *quite normal , it asked me to say the words and give me the points* |
| Participant I | *I feel motivated because I can practice by myself and get feedback.* |
| Participant J | *It is good because I can improve my pronunciation which I have better understanding in English sounds.* |
| Participant K | *neutral* |
| Participant L | *I think I should use it more because it is effective and actually helps improve my pronunciation. I can learn how to produce sounds from the american app and practice on speakometer* |
| Participant M | *Better* |

*Question 3*

| **Question 3** | **Have you noticed any changes in your perception of English sounds since incorporating free pronunciation apps into your learning process?** |
|---|---|
| Participant A | *Yes* |
| Participant B | *Yes. Before I didn't know what are vowels and consonants in English but now I know. I can also improve my pronunciation of words that were mispronounced before such as thought, math, basic, massage, etc.* |
| Participant C | *yes i have* |
| Participant D | *yes i have* |
| Participant E | *It helped me distinguish the sounds more clearly* |
| Participant F | *Yes, I have. I need to practice some intonation and improve my common mistakes such as consonant clusters, ending sounds* |
| Participant G | *Yes, I pay attention to ending sounds and some vowel sounds. I didnt learn about it before so I mispronounced most of them* |
| Participant H | *a little* |
| Participant I | *Absolutely. I've noticed significant improvements in my pronunciation. I had problems with th, dg, s, sh, ch sounds because we dont have in vietnamese. From the apps I can distinguish them better.* |
| Participant J | *Yes, because I understand English sounds better, particularly th, s, r, j and minimal pairs* |
| Participant K | *yes* |
| Participant L | *I have because I can identify sounds and be able to pronounce it better* |
| Participant M | *yes* |

*Question 4*

| **Question 4** | **Can you share specific instances where you found those apps helpful or challenging for pronunciation practice?** |
|---|---|
| Participant A | *Useful: instant feedback from the Speakometer app and the detailed explanations from Mastering of American Accent* |
| Participant B | *I think AI feedback is very useful because I can practice by myself. Thanks to the color-coded, I know what and how to improve my mistakes* |
| Participant C | *i can know that what is actually my fault in order to fix* |
| Participant D | *yes, I can* |
| Participant E | *I can practice the sounds in single, before practising in whole sentences, especially sound /ð? and sound/θ/und* |
| Participant F | *I think some consonant sounds are hard for me* |
| Participant G | *The feedback from the app called speakometer is helpful. However, sometimes i read the word correct but it said i was wrong* |
| Participant H | *useful, because it separate specific sounds* |
| Participant I | *useful because i can check my errors and use american accent app to look for the way to articulate the sounds more correctly* |
| Participant J | *The apps are useful because the theory sections have a lot of practice to improve my pronunciation.* |
| Participant K | *not now* |
| Participant L | *i think two apps are useful because I can read and learn it at home. american app provides detailed information. Speakometer gives a lot of practice (20 words each time I login)* |
| Participant M | *Linking sounds* |

*Question 5*

| **Question 5** | **Have you noticed any improvement in your English pronunciation while and after using free apps?** |
|---|---|
| Participant A | *Yes, while I use the app, I speak clearer and more accurate. After I use the app for a while, I can hear and understand what my American co-teachers say in our meetings* |
| Participant B | *Yes. I think I speak more clearly without rising the intonation too high or too low as before* |
| Participant C | *yes i have* |
| Participant D | *yes i have* |
| Participant E | *the way to show closed sounds when pronoun any English words* |
| Participant F | *Yes, I have. I think I pronounce more clearly. My teacher said that my intonation is better and easier to understand* |
| Participant G | *Yes, my students said that I pronounce nicer than before* |
| Participant H | *yeh, a bit* |
| Participant I | *Certainly. I think I need to use it more frequently for better results.* |
| Participant J | *Yes. I produce sounds more controllably.* |
| Participant K | *Yes* |
| Participant L | *Yes because I feel like my intonation is no longer going too high or too low like in Vietnamese. I can also identify minimal pairs as well as be able to pronounce consonant clusters even though I still need more practice* |
| Participant M | *Yes* |

*Question 6*

| **Question 6** | **In what ways do you think these pronunciation free apps have influenced your language learning process?** |
|---|---|
| Participant A | *I think it helps me to be more independent. Because the apps are free so I can practice at home without worrying about making mistakes or being humiliated* |
| Participant B | *I think due to the convenience of the apps. Most importantly, both of the apps are free so I can learn it with my kids.* |
| Participant C | *i can know exactly how to pronounce a large number of words* |
| Participant D | *speaking* |
| Participant E | *They are convinient, short and simple knowledge for any learner to be able to follow and self study* |
| Participant F | *I think free apps help me to practice english pronunciation and help me detect my errors* |
| Participant G | *I think it is because of the convenience because i can practice everywhere and i can use it to my students nd my children* |
| Participant H | *Students can learn without paying money, it should be used out of the class.* |
| Participant I | *Because it is free so everyone can use it. Not many people are willing to pay for apps to learn English or pronunciation, so this is good.* |
| Participant J | *Because it's free and usefull.* |
| Participant K | *positive* |
| Participant L | *I think because of the AI and free so I have more motivation to use it* |
| Participant M | *Speak English better* |

## Appendix E

*Pronunciation Teaching Materials Used for the Experimental Group*

*Introduction - Session 1*

**PRONUNCIATION TRAINING**

**Instructor**: Nguyễn Xuân Phú Sang
**Outcomes**:

- Assess Vietnamese English teachers' perceptions about pronunciation training in Vietnam;
- Improve Vietnamese English teachers' pronunciation using MAPT apps (*Mastering American Accent* and *Speakometer*);
- Introduction to IPA and phonetic transcriptions;

**Course Description**:
This course is specifically designed for Vietnamese English teachers who work in primary, secondary, and high schools in Hanoi and have no experience in pronunciation training. Comprising a total of 8 sessions, each session is dedicated to addressing a particular aspect of pronunciation. These sessions are primarily target common mistakes made by Vietnamese English learners.

***Session 1: The Vowel Sounds***

- Introduction to American English Pronunciation
- Essential materials
- /i/ vs /I/
- /eɪ/ vs /ɛ/

***Session 2: The Vowel Sounds (Cont.)***

- /ɑ/ vs /ɔ/
- /æ/ vs /ə/
- /ʊ/ vs /u/

***Session 3: The Vowel Sounds (Cont.)***

- Diphthongs: /oʊ/, /ɚ/, /aɪ/, /aʊ/, /ɔɪ/

***Session 4: The Consonant Sounds + Syllable Stress***

- Consonant Sounds
- Syllable Stress
- How to improve your intonation?

***Session 5: Casual versus Formal Speech***

- Contractions
- Shortened Sentences and Simplified Grammar
- Words with Dropped Syllables

***Session 6: Consonant Clusters***

- Consonant Clusters
- Final Consonants

***Session 7: Remember Exceptions***

***Session 8: The Schwa Sound***

**Materials**:

- *Mastering of American Accent by Lisa Mojsin*
- *Mastering of American Accent* applications
- *Speakometer* applications
- PPT
- Practice Worksheet
- Pre-Posttest
- Questionnaire at the end of the course

## *Lesson Excerpted from the Course - Session 6*

***Session 6: Consonant Clusters***

- Consonant Clusters

What is **consonant clusters**?

Two or more consonant sounds together are called "consonant clusters." Many languages do not have any words with consonant clusters. Therefore, when native speakers of these languages speak English, they tend to skip one or more of the consonants.
➔ Make sure you pronounce every consonant sound!

Look at these common words with consonant clusters

### *Common Words with Consonant Clusters*

| *say:* | *don't say:* |
|---|---|
| instantly | instan...ly |
| hopefully | ho...fully |
| apartment | apar...ment |
| worked (sounds like "workt") | wor… |
| textbook (sounds like "tekstbook") | tes...book |
| extra (sounds like "ekstra") | estra |
| vodka | vo...ka |
| strength | stren...th |
| recognize | reco...nize |

**1/ Different Sounds for /x/**
**Activity 1**: Read these following words out loud and pay attention to the consonant clusters with /x/:

| | | | |
|---|---|---|---|
| e**xtr**eme /**str**eam | e**xtr**a | e**xtr**a**ct** | exactly |
| acce**pt** >< asset | su**cc**ess | context | e**xp**ect |
| next | a**cc**ident | e**xt**in**gu**ish | exa**mpl**e |

**Activity 2**: Now, look at these minimal pairs below. Pay attention to the differences of given consonant clusters:

| **/s/** | **/ks/** | **/s/** | **/ks/** |
|---|---|---|---|
| nest | next | aspect | expect |
| test | text | contest | context |
| se**ss**ion | se**c**tion | mass | Max |

**Activity 3**: Level the game by reading this following passage. Remember to pay attention to the consonant clu**st**ers as well as other segmental/suprasegmental factors we have learned:

In the next session // of the class, students // will be tested // on their understanding // of aspect /e/// and context in literature /lidərture/. The teacher // expects them // to demonstrate their knowledge // by analyzing various texts // and participating in a lively /laifly/ contest of ideas. Each student will /wil/ have a designated section of the room where they can focus on the task at hand. Max, the top student in the class, is known for his exceptional performance in these sessions. He always exceeds expectations and sets a high standard for his peers to follow.

**2/ Different Sounds for /-ts-/**

**Activity 1**: Read these following words out loud and pay attention to the consonant clusters with /-ts-/:

| /s/ or /z/ | /ts/ | /s/ or /z/ | /ts/ |
|---|---|---|---|
| is | its | was | What's |
| stays | states | pains | paints |
| less | lets | knees | needs |
| fax | facts | lies | lights |

**Activity 2**: Read these following sentences out loud and pay attention to the consonant clusters with /-ts-/:

1. She is happy with its new design.
2. He was wondering, "What's for dinner?"
3. The cat stays indoors // while the dog // states its territory.
4. After the accident, she felt pains in her chest.
5. He paints beautiful landscapes with vibrant colors.
6. It costs less than I expected.
7. She lets her children play outside in the afternoon.
8. Her knees hurt after running for miles.
9. The company needs to improve its customer service.
10. Please send the fax with all the necessary documents.
11. These are the facts you need to consider before making a decision.
12. He lies about his age to get into the club.
13. She turns on the lights before entering the room.

**3/ Different Sounds for /-dz-/**

**Activity 1**: Read these following words out loud and pay attention to the consonant clusters with /-dz-/:

| /z/ | /dz/ | /z/ | /dz/ |
|---|---|---|---|
| fines | finds | rise | rides |
| cars | cards | lens | lends |
| fees | feeds | bills | builds |

**Activity 2**: Read these following sentences out loud and pay attention to the consonant clusters with /-dz-/:

1. David's and Ed's kids are friends.
2. She feeds the cats and cleans the yards. → Đúng **dz**ị / dzậy /dạ → /y/
3. The brides got diamonds from their husbands.
4. He accepts rides from friends.
5. He needs the facts about the debts.

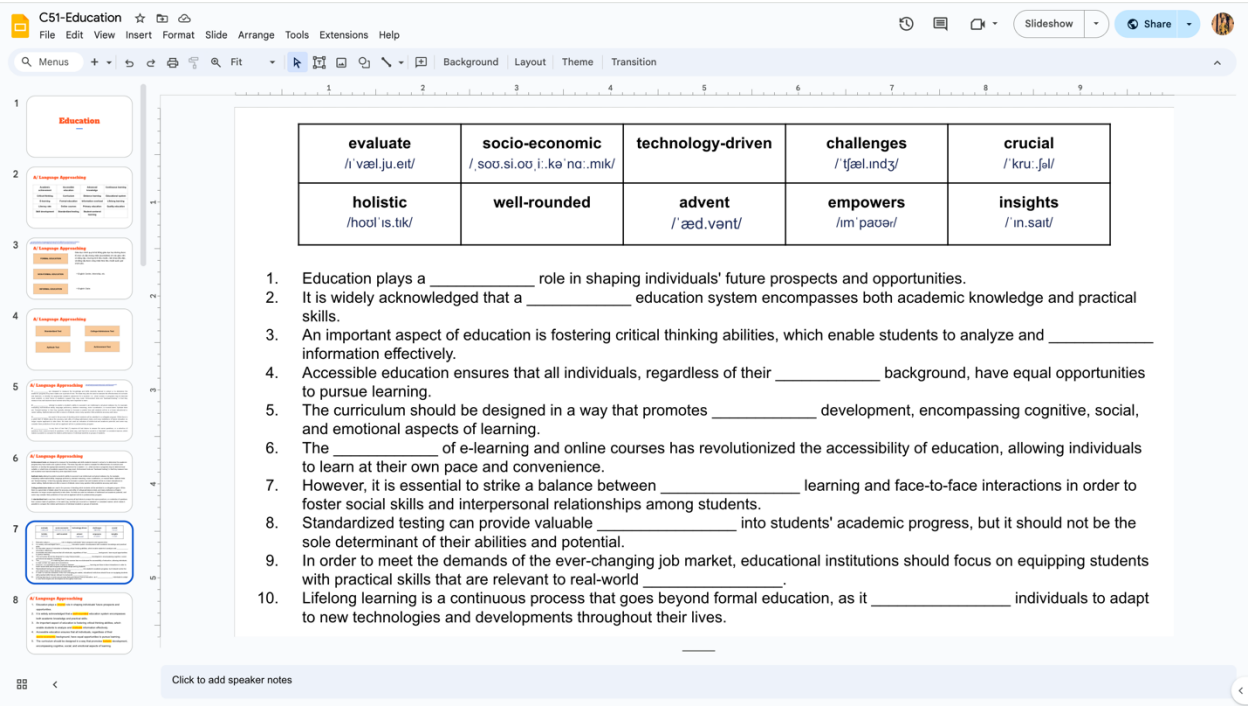
**4/ Tongue Twisters**

1. She sells seashells by the seashore.

2. Peter Piper // picked a peck of pickled peppers.
3. Betty Botter // bought some butter // but she said // the butter's bitter.
4. How much wood // would a woodchuck // chuck // if a woodchuck // could chuck wood?
5. Fuzzy Wuzzy was a bear, Fuzzy Wuzzy had no hair, Fuzzy Wuzzy wasn't very fuzzy, was he?
6. Black bugs blood.
7. Six slippery snails slid slowly seaward.
8. Red lorry, yellow lorry.
9. Crisp crusts crackle and crunch.
10. Fred fed Ted bread, and Ted fed Fred bread.

## Appendix F

*Pronunciation Teaching Materials Used for the Control Group*



C51-Education

| | | | | |
|---|---|---|---|---|
| **evaluate** /ɪˈvæl.juˌeɪt/ | **socio-economic** /ˌsoʊ.si.oʊˌiː.kəˈnɑː.mɪk/ | **technology-driven** | **challenges** /ˈtʃæl.ɪndʒ/ | **crucial** /ˈkruːʃəl/ |
| **holistic** /hoʊlˈɪs.tɪk/ | **well-rounded** | **advent** /ˈæd.vənt/ | **empowers** /ɪmˈpaʊər/ | **insights** /ˈɪn.saɪt/ |

1. Education plays a _____ role in shaping individuals' future prospects and opportunities.
2. It is widely acknowledged that a _____ education system encompasses both academic knowledge and practical skills.
3. An important aspect of education is fostering critical thinking abilities, which enable students to analyze and _____ information effectively.
4. Accessible education ensures that all individuals, regardless of their _____ background, have equal opportunities to pursue learning.
5. The curriculum should be designed in a way that promotes _____ development, encompassing cognitive, social, and emotional aspects of learning.
6. The _____ of e-learning and online courses has revolutionized the accessibility of education, allowing individuals to learn at their own pace and convenience.
7. However, it is essential to strike a balance between _____ learning and face-to-face interactions in order to foster social skills and interpersonal relationships among students.
8. Standardized testing can provide valuable _____ into students' academic progress, but it should not be the sole determinant of their abilities and potential.
9. In order to meet the demands of the ever-changing job market, educational institutions should focus on equipping students with practical skills that are relevant to real-world _____.
10. Lifelong learning is a continuous process that goes beyond formal education, as it _____ individuals to adapt to new technologies and developments throughout their lives.

Click to add speaker notes