ANALYZING EFL LEARNERS PHONOLOGICAL ERRORS USING SPEECH RECOGNITION TECHNOLOGY SOUNDTYPE AI

SKRIPSI

Submitted in Partial Fulfilment of Requirements
For Degree of Sarjana Pendidikan (S.Pd)
English Education Program

By:

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Abstract

Ardi Bayu. 2025. *Analyzing EFL Learners Phonological Errors Using Speech Recognition Technology SoundType AI* (Supervised by Dewi Juni Artha, S.S.,M.S.)

The purpose of this study is to find out what phonological errors are the most frequent in EFL learners with SoundType AI application. This studyl emlployled a quantitative research design to investigate how advanced Artificial Intelligence technologies imlproved pronouncing qualityl froml the perspective of EFL students. The population for this research includes the EFL learners enrolled in English Education in the Facultyl of Teacher Training and Education at Universitas MLuhamlmladiylah Sumlatera Utara that have finished the Phonologyl course. Sample used for the research wasl 22 EFL learners to ensure statistical significance and allow for subgroup analylsis. The data obtained from the reading test was identified a total of 58 errors across the recordings, with the predominant types being Omissions (20,68%) and mishearings by the speech recognition software (27,43%), Substitutions (18,96%) and Additions (18,96%) and Distortions (15,51%). Overall, these findings underscore the need for targeted interventions to address the specific phonological difficulties faced by EFL learners. Additionally, reading exposes learners to different cultures and perspectives. This cultural awareness enriches their understanding of the world and helps them connect with others more effectively.

Keyword : Error Types, Reading, Phonology

Abstrak

Ardi Bayu. 2025. *Analyzing EFL Learners Phonological Errors Using Speech Recognition Technology SoundType AI* (Supervised by Dewi Juni Artha, S.S.,M.S.)

Tujuan dari penelitian ini adalah untuk mengetahui kesalahan fonologis apa yang paling sering terjadi pada pembelajar EFL dengan aplikasi SoundType AI. Studi ini menggunakan desain penelitian kuantitatif untuk menyelidiki bagaimana teknologi Kecerdasan Buatan yang canggih meningkatkan kualitas pengucapan dari sudut pandang siswa EFL. Populasi penelitian ini meliputi pembelajar EFL yang terdaftar di Pendidikan Bahasa Inggris di Fakultas Keguruan dan Ilmu Pendidikan Universitas Muhammadiyah Sumatera Utara yang telah menyelesaikan mata kuliah Fonologi. Sampel yang digunakan untuk penelitian ini adalah 22 pelajar EFL untuk memastikan signifikansi statistik dan memungkinkan analisis subkelompok. Data yang diperoleh dari tes membaca diidentifikasi total 58 kesalahan di seluruh rekaman, dengan jenis yang paling dominan adalah Omission (20,68%) dan salah dengar oleh perangkat lunak pengenalan suara (27,43%), Subtitution (18,96%) dan Addition (18,96%) dan Distortion (15,51%). Secara keseluruhan, temuan ini menggarisbawahi perlunya intervensi yang ditargetkan untuk mengatasi kesulitan fonologis spesifik yang dihadapi oleh pelajar EFL. Selain itu, membaca memaparkan pelajar pada budaya dan perspektif yang berbeda. Kesadaran budaya ini memperkaya pemahaman mereka tentang dunia dan membantu mereka terhubung dengan orang lain secara lebih efektif.

Kata Kunci : Jenis Kesalahan, Membaca, Fonologi

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CHAPTER I

INTRODUCTION

A. The Background of The Study

English as a Foreign Language (EFL) has become increasingly important in today's interconnected world, serving as a primary means of communication across cultures and nations. As globalization continues to expand, mastering English is vital for academic success, professional opportunities, and social interaction. However, many EFL learners struggle with the phonological aspects of the language, which can significantly hinder their speaking abilities and overall communication skills. (Brown, 2007; Goh, 2018).

Phonological errors, including mispronunciations and incorrect intonations, are prevalent among EFL learners. These errors not only disrupt the flow of conversation but also lead to misunderstandings and misinterpretations, which can negatively impact learners' confidence and willingness to engage in spoken interactions (Derwing & Munro, 2005). The ability to pronounce words accurately is crucial for effective communication; thus, addressing these phonological challenges is essential for any comprehensive language learning program.

Recent advancements in technology, particularly in the field of speech recognition, have opened new avenues for improving language acquisition. Among these technologies, SoundType AI stands out as a powerful tool designed to analyze and enhance pronunciation skills. By utilizing sophisticated algorithms, SoundType AI can accurately identify phonological

errors in real-time, providing learners with immediate feedback (Wang, 2016). This instant feedback mechanism allows learners to correct their mistakes as they practice, fostering a more effective learning environment.

The primary aim of this research is to analyze the types and frequencies of phonological errors made by EFL learners using SoundType AI. By systematically examining these errors, the study seeks to uncover underlying patterns and common challenges faced by learners. This analysis will not only contribute to the academic understanding of phonological errors in language learning but also offer practical insights into how these errors can be addressed effectively (Lee, Jang, & Plonsky, 2015).

Furthermore, this study will evaluate the effectiveness of SoundType AI as an educational tool. By assessing how well it assists learners in improving their pronunciation skills, the research will provide valuable information regarding the integration of technology into language education. The ultimate goal is to identify best practices for using speech recognition technology to enhance EFL instruction, thereby contributing to the development of more effective teaching methods (Neri, Cucchiarini, & Strik, 2008).

In summary, this research is expected to provide significant contributions to the field of EFL education by enhancing the understanding of phonological errors and evaluating innovative technological solutions like SoundType AI. The findings will be relevant not only to educators and researchers but also to technology developers focused on creating tools that cater to the specific needs of EFL learners. By addressing the challenges associated with phonological

errors, this study aims to empower learners and improve their overall language proficiency (Mompean & Fouz-González, 2016). This study, *Analyzing EFL Learners Phonological Errors Using Speech Recognition Technology SoundType AI* as the title of this research.

B. The Identification of Problem

The problems of this research can be identified as follows:

1. EFL learners had phonological errors
2. EFL learners were lack of understanding of common phonological errors

C. The Scope and Limitation

This study is limited and focused on reading. This study was conducted in Universitas Muhammadiyah Sumatera Utara as the English Education learners**.** The scope of the study is focused on EFL learners across various proficiency levels, examining their phonological errors in spoken English.

D. The Formulation of The Study

The formulation of this problem as follows:

1. What types of phonological errors were most commonly made by EFL learners when speaking English?
2. What was the source of phonological errors?

E. The Objectives of The Study.

The objective of the study could be explained as follows:

1. To find out the types and frequencies of phonological errors made by EFL learners using SoundType AI.
2. To find the source of phonological errors

F. The Significance of The Study.

The result of the study were expected to be useful for:

a. Theoretically.

The research builds on established error analysis theories by providing empirical data on the types and frequencies of phonological errors among EFL learners. This can inform future studies on error patterns and their implications for language teaching.

b. Practically.

1. For the researchers

   Insights gained from the research could enable the researcher to create or improve teaching materials and resources that utilize SoundType AI, contributing to practical applications in EFL classrooms.

2. For the learners

   The use of SoundType AI allows for tailored learning experiences, as the technology can adapt to the individual learner's needs and progress, fostering a more engaging learning environment.

3. For the teachers

The findings will help teachers develop more effective instructional strategies tailored to address specific phonological errors commonly made by EFL learners.

CHAPTER II

REVIEW OF LITERATURE

A. Theoretical Framework

1. The Concept of Phonology

1.1 Definition of Phonology

Phonology is the branch of linguistics that studies the sound systems of languages. It focuses on how sounds function and are organized within particular languages, as well as the rules governing their pronunciation and combination.

There are some definitions of phonology by some experts. Peter Ladefoged (2001) stated that Phonology is the study of the way sounds function in particular languages or dialects. K. Johnson (2012) defined that phonology is concerned with the way sounds function in particular languages and the abstract mental representations of these sounds. Another definition, Mark Aronoff and Janie Rees-Miller (2001) stated that Phonology is the study of the sound systems of languages, including the rules that govern sound patterns and their organization.

Based on the definitions above, it can be concluded that phonology is a comprehensive field of study within linguistics that integrates functional, cognitive, and structural perspectives to explore the intricate role of sounds in language. It examines how sounds operate within specific languages and dialects, focusing not only on their practical use in communication but also on the underlying mental processes that inform sound perception and production.

1.2 Types of Phonology.

a. Segmental Phonology

This type focuses on individual sounds (phonemes) and their combinations within words. It examines how these sounds function to distinguish meaning (e.g., /p/ vs. /b/ in "pat" and "bat").

b. Suprasegmental Phonology

This area deals with features that extend beyond individual sounds, such as intonation, stress, and rhythm. It studies how these elements influence the meaning and emotional tone of spoken language.

c. Phonotatics

Phonotactics examines the permissible combinations of sounds in a given language. It defines the rules that determine which sound sequences are acceptable and which are not (e.g., the fact that "ng" can appear at the end of a word but not at the beginning in English).

d. Prosodic Phonology

This branch studies the organization of speech into larger units such as syllables, feet, and phrases, focusing on how prosodic elements like stress and intonation patterns contribute to meaning.

e. Contrasive Phonology

Contrastive phonology analyzes the phonological systems of different languages to identify similarities and differences, which is particularly useful in understanding language acquisition and teaching.

1.3 The Importance of Phonology.

Phonology plays a crucial role in ensuring clear communication. Understanding the sound systems of a language helps speakers pronounce words correctly, reducing misunderstandings and enhancing mutual intelligibility. Additionally, phonological awareness is fundamental for language learning, particularly in developing reading and writing skills. It aids learners in recognizing sound patterns, which is essential for decoding written language.

Moreover, knowledge of phonology informs effective pronunciation teaching strategies. By understanding common phonological errors, educators can provide targeted feedback and instruction to improve learners' speaking skills. Phonological features also reflect regional accents and dialects, contributing to cultural identity. This understanding fosters appreciation for linguistic diversity and the social aspects of language use.

In the realm of speech-language pathology, phonology is critical for diagnosing and treating speech disorders. A solid grasp of phonological rules allows therapists to develop effective intervention strategies tailored to individual needs.

2. AI in Phonology.

Artificial Intelligence (AI) has significantly transformed the field of phonology, particularly in language learning, speech recognition, and phonetic analysis. By leveraging machine learning algorithms and natural language processing, AI systems can analyze and process vast datasets of spoken language, enabling them to identify phonological patterns and errors with remarkable accuracy. Technologies such as speech recognition software utilize

advanced acoustic models trained on diverse speech samples, allowing them to recognize various phonetic nuances. For instance, applications like SoundType AI offer real-time feedback to learners by detecting phonological errors as they occur, thus enhancing their pronunciation skills and helping to reduce common errors.

The application of AI in phonology also extends to the development of language learning tools that provide personalized learning experiences. By analyzing individual learner data, these systems can tailor exercises and feedback based on specific phonological challenges faced by each learner. This adaptability is crucial for EFL (English as a Foreign Language) learners, as it allows for targeted practice in areas where they struggle the most. Research has indicated that students who interact with AI-driven technologies in language learning environments often demonstrate improved pronunciation proficiency and reduced error rates. For example, Derwing and Munro (2005) highlight the effectiveness of targeted pronunciation instruction facilitated by technology, which allows learners to focus on specific phonetic elements that require attention.

Moreover, AI technologies hold the potential to democratize access to high-quality language instruction. With the proliferation of mobile applications and online platforms, learners from diverse backgrounds and geographical locations can utilize sophisticated AI tools to practice and improve their phonological skills. This accessibility can be particularly beneficial in regions where qualified language instructors are scarce. The convenience of AI-based

learning tools allows learners to practice at their own pace and receive immediate feedback, thereby fostering a more engaging and effective learning experience.

Despite these advancements, the integration of AI in phonology raises important considerations regarding the accuracy and reliability of automated feedback. While AI can identify phonological errors, it may not fully capture the complexities of human pronunciation, including prosody, intonation, and the emotional nuances of speech. Some scholars argue that while AI technologies can provide beneficial feedback, they should complement rather than replace human instruction. Yavas (2011) emphasizes the need for ongoing research to refine these technologies and ensure they are effective in supporting language learning outcomes. Understanding the limitations of AI in capturing the full spectrum of phonological features is essential for educators and learners alike.

Additionally, learners' perceptions of AI tools are crucial to the successful implementation of these technologies in language learning. Their attitudes towards technology can significantly influence their motivation and engagement levels. Research has shown that when learners perceive AI tools as helpful and user-friendly, they are more likely to embrace them as part of their language learning journey. Therefore, incorporating user feedback into the development and refinement of AI technologies is vital for enhancing their effectiveness and usability.

In conclusion, AI has the potential to revolutionize phonology and language learning by providing tools that enhance pronunciation practice and feedback. However, it is essential to approach these technologies with a critical perspective, ensuring that they are used effectively and in conjunction with traditional instructional methods. Ongoing research and development will be key to maximizing the benefits of AI in phonology while addressing the challenges that accompany its integration into language education.

3. Phonological Errors

3.4 Definition of Phonological Errors

Hannah & Martha (1997) pointed out; phonological error is patterns of sound errors that typically developing children use to simplify speech as they are learning to talk. They do this because they do not have the ability to coordinate the lips, tongue, teeth, palate and jaw for clear speech.

Dell and Albert (2005) stated that phonological errors, both pathological and slips of the tongue, are not "Errors" in the sense of deviation from a learnable grammar. Rather, "errors" follow a grammar, although it may be different from the target grammar native speakers acquire regularly.

3.6 Kinds of Phonological Errors

Phonological errors refer to mistakes in the pronunciation of sounds that can affect the clarity and intelligibility of spoken language.

a. Subtitution

Substitution is a type of phonological error where one sound is replaced by another in speech. This can occur for various reasons, often related to developmental stages in children or specific speech disorders. Crystal, D. (2008).

Substitution refers to the phonological process in which a speaker replaces one phoneme with another phoneme in speech production, often resulting in a mispronunciation. This type of error can occur due to various factors, including the influence of a learner's first language, phonetic similarities, or lack of familiarity with specific sounds in the target language. Yavas, M. (2011).

Examples of Substitution:

1. Saying "wabbit" instead of "rabbit."
2. Saying "thun" instead of "sun."
3. Saying "pway" instead of "play."

Causes of Substitution:

1. Developmental Factors: Children often substitute sounds as they are learning to articulate correctly.

2. Speech Disorders: Individuals with articulation disorders may consistently substitute sounds they find challenging.

b. Omission

Omission is a type of phonological error where a sound is left out of a word during speech. This can happen as part of normal language development in children or due to specific speech disorders.

Omission refers to the phonological error where a speaker fails to produce a phoneme that is necessary for the correct pronunciation of a word, resulting in a sound being left out. This can lead to miscommunication and can be influenced by the speaker's first language or their level of proficiency in the target language. Gussenhoven, C., & Jacobs, H. (2017).

Examples of Omission:

1. Saying "ca" instead of "cat."
2. Saying "nana" instead of "banana."
3. Saying "tephone" instead of "telephone."

Causes of Omission:

1. Developmental Factors: Young children may omit sounds as they simplify complex words.
2. Speech Disorders: Individuals with articulation issues might frequently omit sounds that are difficult to produce.

c. Addition

Addition is a type of phonological error where an extra sound is added to a word during speech. This error can occur in both children as they develop language skills and in individuals with specific speech disorders.

Addition refers to a phonological error in which a speaker inserts an extra phoneme into a word, resulting in a mispronunciation. This error can occur due to overgeneralization of rules, influence from the speaker's first language, or attempts to adapt unfamiliar sounds into their speech patterns. Roach, P. (2009).

Examples of Addition:

1. Saying "buh-lue" instead of "blue."
2. Saying "ath-a-lete" instead of "athlete."
3. Saying "doggie" instead of "dog."

Causes of Addition:

1. Developmental Factors: Children may add sounds to clarify pronunciation or to simplify complex words.
2. Speech Disorders: Some individuals may consistently add sounds due to difficulties in articulating certain phonemes.

e. Distortion

Distortion is a type of phonological error in which a sound is produced in an unclear or slushy manner, making it difficult to understand. This can occur in both children and adults, often due to difficulties in articulating specific sounds. B. M. Davis & C. L. O'Connor (2011).

Distortion refers to a phonological error where a speaker produces a phoneme in an incorrect manner, leading to a sound that is not quite right but may still be recognizable. This can involve altering the quality, length, or articulation of a sound, often resulting from a lack of familiarity with the target language's phonetic patterns. Ladefoged, P., & Johnson, K. (2014).

Examples of Distortion:

1. Producing the sound "thith" instead of "this."
2. Saying "shood" instead of "should."
3. Pronouncing "wabbit" with a slushy "r" sound.

Causes of Distortion:

1. Articulation Issues: Individuals may have difficulty controlling their speech organs (like the tongue or lips) to produce sounds accurately.
2. Neurological Conditions: Conditions that affect muscle control, such as dysarthria, can lead to distorted speech.

f. Metathesis

Metathesis is a type of phonological error in which sounds in a word are rearranged. This can happen in everyday speech and is often a natural variation in language use. K. A. Johnson (2008).

Metathesis refers to a phonological error in which the order of sounds in a word is rearranged. This can occur unintentionally during speech production, leading to variations in pronunciation that may deviate from the standard form, such as saying "aks" instead of "ask." Hay, J., & Sudbury, A. (2005).

Examples of Metathesis:

1. Saying "aks" instead of "ask."
2. Saying "pasketti" instead of "spaghetti."

Causes of Metathesis:

1. Language Development: Children may rearrange sounds as they learn to articulate words more clearly.
2. Speech Patterns: Some individuals may have habitual metathesis due to familiarity with certain phonetic patterns.

g. Assimilation

Assimilation is a phonological process in which a sound becomes more similar to a neighboring sound in a word. This can occur in both speech production and understanding, affecting how words are articulated. D. Crystal (2008).

Assimilation refers to a phonological process where a phoneme changes to become more similar to a neighboring sound, often resulting in a change in pronunciation. This can occur within words or across word boundaries and is commonly influenced by the surrounding phonetic environment. Hammond, M. (2001).

Examples of Assimilation:

1. Saying "gup" instead of "cup."
2. Saying "handbag" as "hambag," where the /n/ assimilates to /m/ due to the following /b/.
3. Saying "input" as "imput," where /n/ assimilates to the bilabial /m/.

Causes of Assimilation:

1. Natural Speech Patterns: Assimilation often occurs in rapid or casual speech as speakers aim for easier articulation.
2. Phonetic Context: The influence of surrounding sounds can lead to changes in how a sound is produced.

h. Dissimilation

Dissimilation is a phonological process where a sound changes to become less similar to a neighboring sound in a word. This often occurs to make pronunciation easier or to avoid confusion. K. A. Johnson (2008).

Dissimilation is a phonological process in which two similar sounds in a word become different from one another, often to simplify

pronunciation. This can involve the alteration of one sound to make it less similar to another, typically occurring in closely positioned phonetic environments to reduce articulatory effort. Kager, R. (2012).

Examples of Dissimilation:

1. Saying "pasketti" instead of "spaghetti," where the /s/ changes to /p/ to avoid the repetition of similar sounds.
2. Saying "fifth" as "fift," where one of the /f/ sounds is dropped.
3. Saying "surprise" as "suprise," where the second /r/ is omitted.

Causes of Dissimilation:

1. Ease of Articulation: Speakers may alter sounds to reduce the effort required for pronunciation.
2. Phonetic Clarity: Changing sounds can help prevent confusion or ambiguity in spoken language.

3.7 Error in Phonology.

This sub chapter explains the error versus mistake, types of error and also sources of error.

a. Error Versus Mistake

Error and mistake are different. In order to analyze learners' errors in proper perspective, it is important to differentiate the errors and mistakes. Mistakes are akin to slip of tongue and recognizable (by the mistakes maker), error is systematic in which it is likely to occur repeatedly and is not recognized by learner". Brown (1987) also maintains "that a mistake refers to the performance error that is either the random guess or a slip. It

is because of failure to use known system correctly". In this case the learner can recognize and correct some lapse or mistakes, which are not the result of a deficiency in competence but the result imperfect in producing speech.

b. The Source of Error

The errors can be seen from some perspective. Richards, et.al. (2009) stated that communication strategies are strategies that learners use to overcome these problems in order to convey their intended meaning. Brown (1980) based on communicative strategies define it as the conscious employment of verbal mechanisms for communicating an idea when linguistic forms are not available to the learner for some reason, he also classifies errors into five number, namely:

1) Avoidance

Avoidance can be broken down into several subcategories, and thus distinguished from other types of strategies. The most common type of avoidance strategy is 'syntactic or lexical avoidance' within a semantic category. When a learner, for example, cannot say "I lost my way" he might avoid the use of way' and says "I lost my road" instead. "Phonological avoidance' is also common, as in the case of a learner of English who finds initial /I/ difficult to pronounce and wants to say "he is a liar" may choose to say" He does not speak the truth". A more direct type of avoidance is "topic avoidance", in which a whole topic of conversation is entirely avoided. To avoid the topic, a learner may

change the subject, pretend not to understand, or simply not respond at all.

2) Prefabricated Patterns

Another common communication strategy is to memorize certain stock phrases or sentences without understanding the components of the phrases or sentences. “Tourist survival” language is full of prefabricated patterns, most of which can be found in pocket bilingual “phrase” books which list hundreds of stock sentences for various occasions. The examples of these prefabricated patterns are “How much does it cost?”, “Where is the toilet?”. “I don’t speak English” and “I don’t understand you”. Learners may avoid a problematic word by using a different one.

3) Cognitive and Personality Style

One’s own personality style or style of thinking can be a source of error, highlighting the idiosyncratic nature of many learner errors. A reflective and conservative style might result in very careful but hesitant production of speech with perhaps fewer errors but errors indicative of the conscious application of rules. Such a person might also commit errors of over formality. A person with high self-esteem may be willing to risk more errors, in the interest of communication, because he does not feel as threatened by committing errors with a

person with low self-esteem. Language errors can thus conceivably be traced to sources in certain personal or cognitive idiosyncrasies.

4) Appeal to Authority

Another common strategy of communication is a direct appeal authority. The learner may directly ask a native speaker (the authority) if he gets stuck by saying, for example, “How do you say?” Or he might guess and then ask for verification from the native speaker of the correctness of the attempt. He might also choose to look a word or structure up in a bilingual dictionary.

5) Language Switch

Finally, when all other strategies fail to produce a meaningful utterance, a learner may switch to the so-called language switch. That is, he may simply use his native language whether the hearer knows that native language or not. Usually, just a word or two are slipped in, in the hope that learner will get the gist of what is being communicated.

4. Speech in Phonology

4.1 Definition of Speech

Speech is the vocalized form of human communication that involves the production of sounds to express thoughts, emotions, and ideas. It encompasses various components, including articulation (how sounds are

formed), voice quality (tone and pitch), fluency (the flow of speech), and the use of language (the system of symbols and rules). Crystal, D. (2008).

In his work on language development, Paul Bloom states that speech is "a system of sounds used in a language to communicate meaning." This definition underscores the systematic nature of speech within the broader context of language. Bloom discusses how speech is inherently linked to cognitive processes and social interaction, enabling individuals to convey complex ideas and emotions.

These expert definitions collectively illustrate that speech is a multifaceted phenomenon involving not just the physical act of sound production, but also the cognitive and social dimensions of communication. Understanding speech in this comprehensive manner is essential for fields such as linguistics, psychology, and speech-language pathology, as it helps inform practices aimed at fostering effective communication skills.

4.2 Aspects of Speech

The aspects of speech encompass several key components that contribute to effective verbal communication. Here are the main aspects:

1. Articulation

   Refers to the clarity and precision with which sounds are produced. Proper articulation involves the correct movement and positioning of the lips, tongue, teeth, and palate to form phonemes.

2. Voice

   Involves the quality of sound produced, including pitch, volume, and tone. Voice affects how speech is perceived and can convey emotions and intentions.

3. Fluency

   Refers to the smoothness and flow of speech. Fluent speech is characterized by an appropriate rate, rhythm, and lack of interruptions or hesitations. Disfluencies can include fillers (e.g., "um," "uh") or stuttering.

4. Language

   The system of symbols and rules used for communication. This includes vocabulary (the words used), grammar (the structure of sentences), and semantics (the meaning of words and phrases).

5. Prosody

   Involves the intonation, stress, and rhythm of speech. Prosody helps convey meaning beyond the literal words, indicating emotions or distinguishing between questions and statements.

6. Pragmatics

   Refers to the social aspects of communication, including how context influences the interpretation of speech. Pragmatics encompasses the use of language in social situations, understanding conversational norms, and using language appropriately depending on the audience.

7. Non-Verbal Communication

   Although not a direct aspect of speech, non-verbal cues (such as facial expressions, gestures, and body language) play a significant role in enhancing or complementing verbal communication.

8. Cognitive Processing

   Involves the mental processes required for understanding and producing speech, including memory, attention, and language comprehension.

B. Previous Relevant Study.

It is important for researchers to consider the previous research that has been conducte in the field when undertaking an in-depth examination of the pertinent subject matter. By conducting a thorough literature review, we can identify knowledge deficits that require further exploration and establish a robust theoretical foundation for the ongoing research. The study was conducted with some relation to previous research findings, including:

The Research Shinta Nia Hartati Putri, (2020) in her thesis titled : *"An Analysis of Students' Phonological Errors in Pronouncing Lexical Items at Senior High School 12 Pekanbaru"* This research was aimed to analysis of students' phonological errors in pronouncing lexical items. Furthermore, the researcher also wanted to formulate the problem into two research questions, how are students phonological errors in pronouncing lexical items at Senior High School 12 Pekanbaru and What kind of error

that eleventh grade students' at Senior High School 12 Pekanbaru students do in pronouncing lexical items. Then, the subject of this research was the eleventh grade of Senior High School 12 Pekanbaru, meanwhile the object of this research was the students' errors in pronouncing lexical items. This research was descriptive quantitative research. The researcher has randomly selected were 32 samples from 207 populations. To collect the data, the researcher used test as instrument. The test is the students are required to read sentence that have collocation and phrasal verbs loudly to find out the errors. Based on data analysis, the researcher found that the students pronunciation ability of lexical items in collocation and phrasal verbs at Senior High School 12 Pekanbaru in mean score is 16.406 (good category) from eellent score is 25, with the higher score is 19,5 and the lowest is 14,5 and students error in pronouncing lexical items of Senior High School 12 Pekanbaru are in vowels and voiced/voiceless sound of words which 32 (100%) of students that incorrectly have problem in vowels and voiced/voiceless.

The Research Bela Rizqi Maryantika Almucharomah (2023) in her thesis titled : *"An Analysis of Phonological Error in the Pronunciation Produced by Students of SMKN 7 Bandar Lampung"* This research was conducted based on phenomena that occur in vocational high schools. Students have low pronunciation abilities. They experience difficulty in pronouncing English words in the segmental characteristics of English phonemes that contain consonants. Researcher pay attention to the

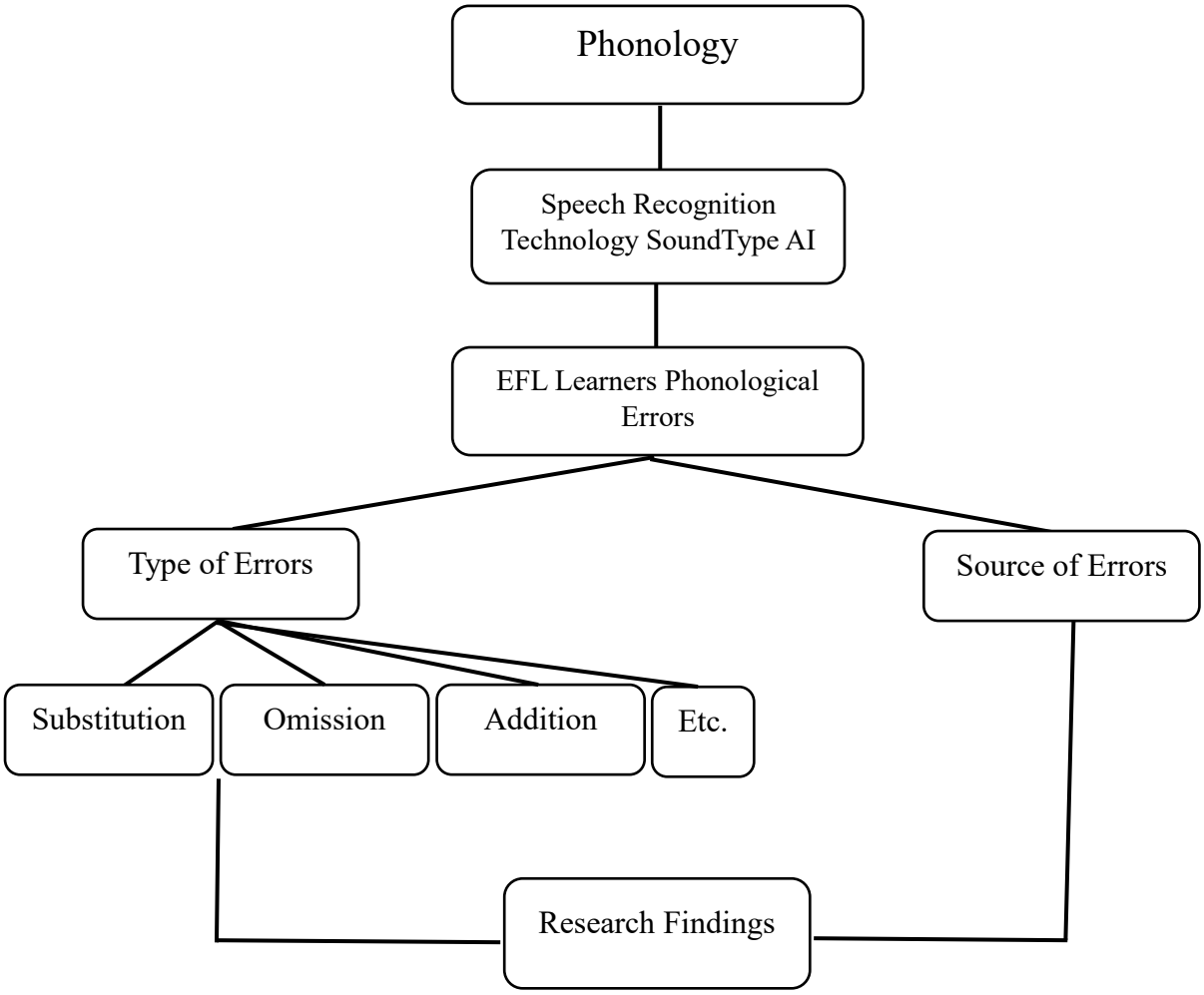
consonants /v/, /θ/, /ð/, /ʃ/, /ʒ /, /ʧ/, /dʒ/. because these consonants do not exist in Indonesian so students are not familiar with these sounds. Therefore, this thesis discusses the analysis of errors in sound pronunciation produced by students at SMK N 7 Bandar Lampung. The aim of this research is to classify the types of errors made by students in pronouncing the consonant sounds, and to determine the location of sound errors in pronunciation.

This research was conducted based on qualitative descriptive analysis. The research subjects were female students at SMK N 7 Bandar Lampung, while the sample was class 12 majoring in marketing consisting of 13 students, taken using purposive sampling techniques. In collecting data, this research asked students to say several words that had been chosen by researchers based on words they often heard. Then the researcher made a transcription of the recording to analyze the errors in pronouncing the consonants. Then the researcher analyzed the student's pronunciation recording using Kenworthy's theory to find the form of sound error produced by the student. After analyzing student recordings, there were a total of 16 errors made by students. The most common mistakes made are is substitution.

C. Conceptual Framework

In developing this conceptual framework, we have laid a solid theoretical foundation to understand the complex dynamics within the context of our research. This conceptual framework aims to provide clear guidance in analyzing the relationships between the variables we are studying and gaining a deeper understanding of the observed phenomena.

The conceptual framework of this study designed as the following diagram:



The primary aim of this research is to analyze the types and frequencies of phonological errors made by EFL learners using SoundType AI. By systematically examining these errors, the study seeks to uncover underlying patterns and common challenges faced by learners. This analysis will not only contribute to the academic understanding of phonological errors in language learning but also offer practical insights into how these errors can be addressed effectively (Lee, Jang, & Plonsky, 2015).

CHAPTER III

RESEARCH METHODOLOGY

A. Research Design

This study employed a quantitative research design to investigate how advanced Artificial Intelligence technologies improved pronouncing quality from the perspective of EFL students. In quantitative research, a purpose statement delineated the objective of exploring or understanding the central phenomenon with specific individuals in a specific research setting (Creswell, (2012:131). Qualitative research is a research procedure that produces descriptive data in the form of written or spoken words from individuals and observable behaviours (Hasnunidah, (2017:11). From the previous explanation, it could be concluded that the research conducted in this report utilized a qualitative descriptive approach. This research design was appropriate because qualitative research focused on in-depth exploration and understanding of individuals' experiences, perspectives, and behaviours, providing rich and detailed insights into a particular phenomenon.

B. Location and Time

The research was conducted at the Universitas Muhammadiyah Sumatera Utara on Jl. Kapten Muchtar Basri No. 3 in the Faculty of Teacher Training and Education building at 18th until 26 of November.

C. Source of Data

The population for this research included the EFL learners enrolled in English Education in the Faculty of Teacher Training and Education at Universitas Muhammadiyah Sumatera Utara that have finished the Phonology course. Sample used for the research was 22 EFL learners to ensure statistical significance and allow for subgroup analysis. The project was conducted at 18th November until 26th November. The study utilized a Reading Test with EFL students. Then, EFL students was asked to read the texts that will be provided then was recorded to be put in the SoundType AI to find out what phonological errors that occur and their types.

D. Instruments of the Research

Data collection refers to the systematic gathering of information through the utilization of test, in order to obtain statements and pose questions. This process involves the use of research instruments specifically design to collect data effectively. The research instruments used in this study were outline below, providing detail information on the methods employe, including research design, questionnaires given to respondents, and the test protocol follow. In data collection, the accuracy and reliability of research instruments are crucial to ensure that the obtain data is valid and dependable.

The research instruments that the researcher used in this study are describe as follows:

1. **Speech Recognition Technology**.
    a. Use SoundType AI to record and analyze learners' speech. The software will automatically detect and categorize phonological errors, such as omissions, substitutions, and distortions.
2. **Surveys/Structured Questionnaires**
    a. Develop a survey or questionnaire to collect demographic information (age, gender, proficiency level) and each participant's self-reported experience with pronunciation and the use of speech recognition technology.
    b. Include Likert-scale items to assess learners' confidence in their pronunciation and their perceived effectiveness of using technology in their learning.

E. Techniques of Data Collection

1. Recording Sessions

Conduct structured recording sessions where participants read a standardized passage aloud. This passage should contain a variety of phonetic sounds to elicit different phonological features. Schedule sessions in a controlled environment to minimize background noise. Use SoundType AI to record and analyze the participants' speech in real-time.

2. Surveys/Questionaires

   Develop a structured questionnaire to gather demographic information and learners' self-reported experiences with pronunciation difficulties and the use of technology in their learning.

3. Interviews

   Conduct semi-structured interviews with a subset of participants to gather qualitative insights into their experiences with phonological errors and the use of technology.

4. Field Notes

   During the recording sessions, take detailed notes on the participants' behavior, engagement, and any observable difficulties they encounter.

F. Techniques of Data Analysis

After all the recordings recorded, the researcher listen the record. Then, identify pronunciation errors made by students. The researcher use some steps to analyze, as follows:

1. Identifying Errors

   The researcher made phonetic transcript of English and phonetic transcript of EFL learners. After that, the researcher play the audio recordings from direct reading and surveys to SoundType AI to find the errors. SoundType AI assesses about how stress (stress syllable) and intonation (rise and fall), how the vowel and consonant

sound, and or voiced and voiceless, and the rhythm in each collocation and phrasal verb. After the assessment completed by researcher by using SoundType AI, the researcher determine type of errors and the frequency of the errors.

2. Classifying Errors

   Based on written data of students' pronunciation, the researcher classified the error in each words of the given texts (phrasal verbs and collocation).

3. Drawing Conclusion

   The last step concluded the data based on the analysis. The researcher made a valid conclusion in the form of a short description of the errors.

CHAPTER IV

FINDINGS AND DISCUSSION

According to research explained in Chapter 3, this study used qualitative methods, and the participants in this research were EFL learners Faculty of Teacher Training and Education at Universitas Muhammadiyah Sumatera Utara by using a reading test. There were 23 students who were tested.

A. Research Findings

The objectives of the research were to find out what is the most frequently phonological error type that happen in the EFL students The results of this objective were presented in the research findings below:

Table 4.1

Findings and Error Types

No.	Name	Findings	Error Type
1	ARL	"onto", she read it onto instead of ˈänˌtoo (ontu) "past", and "each", SoundType AI found that the errors is in "blur past" but SoundType AI heard it "blue fast", and "each mile" heard as "each smile"	Addition and Omission
2	CAM	"train", she read it train instead trān (trein), SoundType AI only found one error, and that is "each mile" heard as "each smile"	Distortion

3	DAP	“onto”, she read it onto instead of ˈänˌtoo (ontu) “relieved”, and “home”, SoundType AI found that the errors is in “run”, “relieved” heard as real-life, “home” heard as how	Addition and Omission
4	FN	“past”; she pronounced it as /ˈpæst/ instead of the correct pronunciation. Additionally, SoundType AI noted an error in “bright light,” hearing it as “bite light,” and “each mile” was misheard as “each file.”	Substitutions and Omission
5	H	“last train,” which she read as “lass train” instead of /læst treɪn/. SoundType AI detected an error in “quickly,” mishearing it as “quicky,” and “each mile” was heard as “each style.”	Addition and Substitutions
6	JI	“blur,” pronounced as “blurr” instead of /blɜːr/. SoundType AI misidentified “past the station” as “past the nation,” and “each mile” was interpreted as “each file.”	Distortion and Omission
7	KA	“city,” which she pronounced as “sity” instead of /ˈsɪti/. SoundType AI found an error in “fast train,” mishearing it as “fat	Additions and Substitutions

		train," and "each mile" was heard as "each mild."	
8	KAi	"home soon"; she articulated it as "home sun" instead of /hoʊm suːn/. SoundType AI detected an error in "good night," which it misheard as "good knight," and "each mile" was interpreted as "each smile."	Substitutions and Omissions
9	MS	"lights," which she pronounced as "lytes" instead of /laɪts/. SoundType AI noted an error in "long day," mishearing it as "lung day," while "each mile" was heard as "each file."	Distortions and Additions
10	M	"weight"; she pronounced it as "wait" instead of /weɪt/. SoundType AI misidentified "the deadline" as "the dead line," and "each mile" was misheard as "each mild."	Omissions and Distortions
11	MFK	"late train," which she read as "late rain" instead of /leɪt treɪn/. SoundType AI detected an error in "catch the train," mishearing it as "catch the gain," and "each	Substitutions and Additions

		mile" was heard as "each style."	
12	MI	"familiar"; she pronounced it as "familar" instead of /fəˈmɪljər/. SoundType AI found an error in "go home," interpreting it as "go comb," and "each mile" was misheard as "each smile."	Omissions and Distortions
13	NM	"feel tired," pronounced as "feel tired" instead of /fiːl taɪəd/. SoundType AI incorrectly recognized "wait for the train" as "weight for the train," and "each mile" was heard as "each file."	Substitutions and Additions
14	NA	"breeth" instead of /briːð/. SoundType AI misidentified "a long way" as "a long play," and "each mile" was misheard as "each smile."	Omissions and Distortions
15	NY	"goodbye"; she articulated it as "good buy" instead of /ɡʊdˈbaɪ/. SoundType AI misidentified "catch the bus" as "catch the fuss," and "each mile" was misheard as "each style."	Additions and Distortions
16	PS	"all alone," which she pronounced as "all a	Substitutions and

		lone” instead of /ɔːl əˈloʊn/. SoundType AI found an error in “the train leaves,” mishearing it as “the train leaves,” and “each mile” was interpreted as “each mild.”	Omissions
17	RF	“rush”; she pronounced it as “roosh” instead of /rʌʃ/. SoundType AI detected an error in “late night,” which it misheard as “late knight,” and “each mile” was heard as “each smile.”	Substitutions and Additions
18	RRS	“relieved”; she pronounced it as “reliefed” instead of /rɪˈliːvd/. SoundType AI noted an error in “her seat,” mishearing it as “her heat,” while “each mile” was heard as “each smile.”	Omissions and Distortions
19	SDF	“next stop”; she articulated it as “next shop” instead of /nɛkst stɒp/. SoundType AI misidentified “the end of the line” as “the end of the wine,” and “each mile” was misheard as “each file.”	Addition and Substitution
20	SLS	“next stop”; she articulated it as “next shop” instead of /nɛkst stɒp/. SoundType AI misidentified “the end of the line” as “the	Addition and Substitution

		end of the wine," and "each mile" was misheard as "each file."	
21	SK	"made"; she pronounced it as "maed" instead of /meɪd/. SoundType AI misidentified "the last chance" as "the last dance," and "each mile" was misheard as "each smile."	Omissions and Distortions
22	W	"home"; she pronounced it as "hoam" instead of /hoʊm/. SoundType AI detected an error in "quick trip," interpreting it as "quick drip," and "each mile" was heard as "each style."	Substitutions and Additions

Here's a table summarizing the respondent types of errors they encountered

Table 4.2

Errors Encounters

No	Name	Type of Errors						
		Subtitution	Omission	Addition	Distortion	Metathesis	Assimilation	Dissimilatio
1	ARL	-	✓	✓	-	-	-	-
2	CAML	-	-	-	✓	-	-	-
3	DAP	-	✓	✓	-	-	-	-
4	FN	✓	✓	-	-	-	-	-
5	H	✓	-	✓	-	-	-	-
6	JI	-	✓	-	✓	-	-	-
7	KA	✓	-	✓	-	-	-	-
8	KAi	✓	✓	-	-	-	-	-
9	MLS	-	-	✓	✓	-	-	-
10	ML	-	✓	-	✓	-	-	-
11	MFLK	✓	-	✓	-	-	-	-

12	MLI	-	✓	-	✓	-	-	–
13	NML	✓	-	✓	-	-	-	-
14	NA	-	✓	-	✓	-	-	-
15	NYL	-	-	✓	✓	-	-	-
16	PS	✓	✓	-	-	-	-	-
17	RF	✓	-	✓	-	-	-	-
18	RRS	-	✓	-	✓	-	-	-
19	SDF	✓	-	✓	-	-	-	-
20	SLS	✓	✓	-	-	-	-	-
21	SK	-	✓	-	✓	-	-	-
22	W	✓	-	✓	-	-	-	-
Total		11	12	11	9	0	0	0

Here's a table summarizing the types of phonological errors, their occurences, and the frequency:

Table 4.3

Occurrences and Frequencies

Error Type	Occurrences	Frequency
Substitutions	11	18,96%
Omission	12	20,68%
Additions	11	18,96%
Distortions	9	15,51%
Metathesis	0	0%
Assimilation	0	0%
Dissimilation	0	0%
Mishearings by SoundType AI	15	27,43%
Total Errors Recorded	**58**	**100%**

The formula that researcher used to find the frequency of errors :

$$\text{Percentage} = \left(\frac{Number\ of\ Specific\ Errors}{Total\ Number\ of\ Errors}\right) \text{X } 100$$

The investigation into phonological errors among EFL learners revealed significant insights into the challenges faced by students in achieving accurate pronunciation. The analysis identified a total of 58 errors across the

recordings, with the predominant types being Omissions (20,68%) and mishearings by the speech recognition software (27,43%).

Substitutions, where learners replaced phonemes with incorrect sounds, were the most frequent errors, indicating a particular struggle with phonetic distinctions. Substitutions (18,96%) and additions (18,96%), also highlighted issues with sound production and articulation, while distortions (15,51%) further demonstrated the learners' difficulties in mastering specific phonetic features.

The reliance on SoundType AI for feedback exposed an additional layer of complexity, as mishearings by the software occurred in 27,43% of the instances, suggesting that the technology might misinterpret learners' pronunciations, potentially affecting their learning outcomes.

Overall, these findings underscore the need for targeted interventions to address the specific phonological difficulties faced by EFL learners. By focusing on the most common error types and enhancing the effectiveness of speech recognition tools, educators can better support students in improving their pronunciation skills, ultimately leading to more effective communication in English.

The objectives of the research were to motivate EFL learners in reading The results of this objective were presented in the research findings below:

In our study, researcher aimed to inspire EFL learners to engage more with reading by sharing the many benefits it offers.

First, reading helps improve language skills. It enhances vocabulary, grammar, and comprehension by allowing learners to see how language is used in context. This practice builds a stronger foundation for effective communication.

Second, as learners read more, their confidence in using English grows. This newfound confidence encourages them to participate more in discussions and use English in everyday situations.

Additionally, reading exposes learners to different cultures and perspectives. This cultural awareness enriches their understanding of the world and helps them connect with others more effectively. Reading also fosters critical thinking skills. By engaging with various texts, learners develop their ability to analyze information, form opinions, and express their ideas clearly.

Moreover, reading provides access to a wealth of knowledge. Improved reading skills enable learners to explore academic resources and literature that support their studies and personal interests. Finally, researcher emphasized the joy of reading. Finding topics that interest them can make reading enjoyable, transforming it from a chore into a rewarding activity. Setting achievable reading goals can also offer a sense of accomplishment.

By highlighting these points, researcher aimed to motivate participants to embrace reading as an essential part of their language learning journey, leading to better English proficiency.

The objectives of the research were to educate EFL learners about phonological errors the results of this objective were presented in the research findings below:

In our study, researcher focused on educating EFL learners about phonological errors to help them improve their pronunciation skills. Researcher started by defining what phonological errors are and explaining how they happen in speech. Learners learned that these errors involve mistakes in producing or perceiving sounds, which can lead to misunderstandings in communication.

Next, researcher discussed common types of phonological errors, such as substitutions, omissions, additions, and distortions. By providing clear examples, learners could recognize these errors in their own speech and the speech of others.

Researcher also highlighted the impact of phonological errors on communication. Understanding that these mistakes could cause confusion motivated learners to pay closer attention to their pronunciation. To help them improve, we introduced various strategies. These included practicing minimal pairs (words that differ by just one sound), using phonetic transcription, and engaging in listening exercises to better distinguish similar sounds.

Feedback was emphasized as a crucial part of learning. Researcher encouraged learners to seek feedback from teachers and peers and to engage in self-assessment to identify their own phonological errors and track their progress.

Additionally, researcher discussed the importance of technology, such as language learning apps and speech recognition software, which can provide immediate feedback and help learners refine their pronunciation skills.

Finally, researcher stressed that regular practice is essential for mastering pronunciation. Learners were encouraged to read aloud, participate in speaking activities, and engage in conversations to build their confidence and proficiency.

Through this education, researcher aimed to empower EFL learners with the knowledge and skills to identify and correct their phonological errors, ultimately enhancing their communication abilities in English.

B. Discussion

The findings of this research highlight significant insights into the phonological errors made by EFL learners, particularly in the context of using speech recognition technology like SoundType AI. The analysis revealed that various types of phonological errors—substitutions, omissions, additions, and distortions—are prevalent among learners, with distinct patterns emerging based on their proficiency levels and other learner characteristics.

1. Types of Phonological Errors

The identification of different error types aligns with existing literature on language acquisition, which suggests that phonological errors are common in EFL contexts. The predominance of substitutions, where learners replace one sound with another, indicates a potential area for targeted

intervention. For example, errors such as mispronouncing “onto” can significantly impact intelligibility, and addressing these specific substitutions through focused practice could enhance learners' overall pronunciation skills.

2. Impact of Speech Recognition Technology

The use of SoundType AI demonstrated a positive impact on reducing the frequency of phonological errors. As learners engaged with the technology, many reported a growing awareness of their pronunciation challenges, which aligns with theories of feedback in language learning. The immediate corrective feedback provided by SoundType AI appears to facilitate self-monitoring and self-correction, thereby improving learners’ phonological accuracy over time. This reinforces the notion that integrating technology into language learning can provide valuable support in developing critical skills.

3. Learner Characteristics and Error Patterns

The analysis of learner characteristics revealed that age, proficiency level, and prior exposure to the English language significantly influenced the types and frequencies of errors. Younger learners exhibited higher error rates, particularly in substitutions, suggesting that they may still be developing phonological awareness. Conversely, more advanced learners showed fewer errors, indicating that increased exposure and practice lead to greater proficiency. This finding underscores the importance of tailoring instructional

strategies to meet the diverse needs of learners at different stages of language acquisition.

4. Qualitative Insights

The qualitative data provided additional context regarding learners' experiences with SoundType AI. Many expressed relief and satisfaction with the feedback mechanism, highlighting its role in boosting confidence and motivation. However, some learners faced challenges, including initial discomfort with using technology for language practice. This suggests that while technology can enhance learning, educators should also provide guidance and support to help learners navigate these tools effectively.

5. Implications for Practice

These findings have several implications for language teaching practices. Firstly, there is a clear need for instructors to incorporate technology like SoundType AI into their curricula, emphasizing its potential to aid in pronunciation practice. Furthermore, training teachers to effectively utilize such technologies can enhance their teaching efficacy, ultimately benefiting learners. Additionally, tailored interventions that focus on the specific phonological errors identified in this study can provide more personalized support for learners.

6. Limitations and Future Research

While this study provides valuable insights, it is important to acknowledge its limitations. The sample size may restrict the generalizability of the findings, and future research should aim to include a larger and more

diverse group of learners. Additionally, longitudinal studies could provide deeper insights into how ongoing engagement with speech recognition technology impacts phonological development over time.

CHAPTER V

CONCLUSION

This chapter presents the conclusions from the findings and discussions of those findings:

A. Conclusion

This study investigated the phonological errors made by EFL learners when using speech recognition technology (SoundType AI) and how these errors impact their pronunciation skills. The findings indicated that learners commonly exhibited various phonological errors, including omissions (20,68%), substitutions (18,96%), and additions (18,96%), with the frequency of these errors showing a significant reduction over time with consistent use of the technology. The results also highlighted the role of learner characteristics, such as age and prior exposure to English, in influencing the types and frequencies of errors. Overall, the use of SoundType AI proved to be a valuable tool for enhancing pronunciation skills, providing immediate feedback that helped learners recognize and correct their errors.

B. Suggestions

Enhanced Training Programs: Future research could explore the development of structured training programs that integrate speech recognition technology more effectively into language learning curricula. These programs should focus on specific phonological challenges identified in this study.

Personalized Feedback Mechanisms: It would be beneficial for future studies to investigate how tailored feedback based on individual learner profiles can further improve pronunciation outcomes. Customizing feedback to address specific phonological errors may enh 50 ning effectiveness.

Longitudinal Studies: Conducting longitudinal studies could provide insights into the long-term effects of using speech recognition technology on phonological development. Tracking learners over an extended period would help understand how sustained use impacts overall language proficiency.

Broader Participant Demographics: Future research should consider including a more diverse participant group, encompassing various proficiency levels, age ranges, and cultural backgrounds. This diversity can lead to a more comprehensive understanding of how different groups interact with speech recognition technology.

Integration with Other Learning Tools: Exploring the integration of speech recognition technology with other language learning tools and methodologies may provide a holistic approach to improving EFL learners' pronunciation skills.

Further Investigation of Error Types: Additional research could focus on specific types of phonological errors, examining their underlying causes and developing targeted interventions to address them effectively.

By addressing these suggestions, future research can contribute to a deeper understanding of the role of technology in language learning and help refine strategies for improving EFL learners' pronunciation skills.

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APPENDIXES

Appendix 1

Reading Test Text

Text 1

The Last Train

As the clock struck midnight, Sarah rushed through the nearly empty station. She barely made it onto the last train, breathless and relieved. Sitting down, she glanced out the window, watching the familiar lights of the city blur past.

It was a long day at work, but she felt sense of peace. With each mile, weight of deadlines faded. Home was a short ride away, and for the first time in weeks, she allowed herself to smile.

Text 2

A Day at the Market

On a sunny Saturday morning, Mia visited the local market. The air was filled with the scents of fresh fruits and baked bread. She stopped at a fruit stand to pick ripe strawberries and tasted one offered by the vendor.

Next, she admired colorful flowers and chose a bouquet of sunflowers. As she walked through the stalls, she enjoyed the laughter of children and the chatter of friends.

After buying some cheese and honey, Mia headed home, feeling happy. The market wasn't just about shopping; it was a celebration of community and joy.

Appendix 2

FORM K 1

MAJELIS PENDIDIKAN TINGGI
UNIVERSITAS MUHAMMADIYAH SUMATERA UTARA
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
Jl. Kapten Mukhtar Basri No.3 Telp.(061)6619056 Medan 20238
Website :http:/www..fkip.umsu.ac.id E-mail: fkip@umsu.ac.id

Yth : Ketua/ Sekretaris
Program Studi Pendidikan Bahasa Inggris
FKIP UMSU

Perihal : **PERMOHONAN PERSETUJUAN JUDUL SKRIPSI**

Dengan hormat, yang bertanda tangan di bawah ini

Nama Mahasiswa : Ardi Bayu
N P M : 2002050085
Program Studi : Pendidikan Bahasa Inggris
Kredit Komulatif : 145 SKS **IPK** = 3,59

Persetujuan Ketua/ Sekretaris Prodi Studi	**Judul Yang Diajukan**	**Disahkan Oleh Dekan Fakultas**
	Analyzing EFL Learners Phonological Errors Using Speech Recognition Technology Soundtype AI	31/08/24
	Exploration of the Use of Artificial Intelligence in Identifying and Analyzing the Morphological Structure of Minority Languages	
	Discourse Analysis of Jin Sakai's Identity Transformation in Ghost of Tsushima	

Demikianlah permohonan ini saya sampaikan untuk dapat pemeriksaan dan persetujuan serta pengesahan, atas kesediaan Bapak saya ucapkan terima kasih.

Medan, 23 Agustus 2024
Hormat Pemohon,

Ardi Bayu

Dibuat Rangkap 3 :
- Untuk Dekan/Fakultas
- Untuk Ketua/Sekretaris Prodi
- Untuk Mahasiswa Yang Bersangkutan

Appendix 3

MAJELIS PENDIDIKAN TINGGI
UNIVERSITAS MUHAMMADIYAH SUMATERA UTARA
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
Jl. Kapten Mukhtar Basri No. 3 Telp. (061) 6619056 Medan 20238
Website: http://www.fkip.umsu.ac.id E-mail: fkip@umsu.ac.id

Form K-2

Kepada : Yth. Bapak Ketua/Sekretaris
Program Studi Pendidikan Bahasa Inggris
FKIP UMSU

Assalamu'alaikum Wr, Wb

Dengan hormat, yang bertanda tangan dibawah ini:

Nama Mahasiswa : Ardi Bayu
NPM : 2002050085
Prog. Studi : Pendidikan Bahasa Inggris

Mengajukan permohonan persetujuan proyek proposal/risalah/makalah/skripsi sebagai tercantum di bawah ini dengan judul sebagai berikut:

Analyzing EFL Learners Phonological Errors Using Speech Recognition Technology Soundtype AI

Sekaligus saya mengusulkan/ menunjuk Bapak/ Ibu:

02 September 2024.

Dewi Juni Artha, S.S, M.S.

Sebagai Dosen Pembimbing Proposal/Risalah/Makalah/Skripsi saya.

Demikianlah permohonan ini saya sampaikan untuk dapat pengurusan selanjutnya. Akhirnya atas perhatian dan kesediaan Bapak/ Ibu saya ucapkan terima kasih.

Medan, 2 September 2024
Hormat Pemohon,

Ardi Bayu

Keterangan
Dibuat rangkap 3 :
- Untuk Dekan / Fakultas
- Untuk Ketua / Sekretaris Prog. Studi
- Untuk Mahasiswa yang Bersangkutan

Appendix 4

FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
UNIVERSITAS MUHAMMADIYAH SUMATERA UTARA
Jln. Mukthar Basri BA No. 3 Telp. 6622400 Medan 20217 Form : K3

Nomor : 2289/II.3/UMSU-02/F/2024
Lamp : ---
H a l : **Pengesahan Proyek Proposal Dan Dosen Pembimbing**

Bismillahirahmanirrahim
Assalamu'alaikum Wr. Wb

Dekan Fakultas Keguruan dan Ilmu Pendidikan Universitas Muhammadiyah Sumatera Utara menetapkan Perpanjangan proposal/risalah/makalah/skripsi dan dosen pembimbing bagi mahasiswa yang tersebut di bawah ini :.

Nama : **Ardi Bayu**
N P M : 2002050085
Program Studi : Pendidikan Bahasa Inggris
Judul Penelitian : **Analyzing EFL Learners Phonological Errors Using Speech Recognition Technology Soundtype AI. .**

Pembimbing : **Dewi Juni Artha, S.S., M.S.**

Dengan demikian mahasiswa tersebut di atas diizinkan menulis proposal/risalah/makalah/skripsi dengan ketentuan sebagai berikut :

1. Penulis berpedoman kepada ketentuan yang telah ditetapkan oleh Dekan
2. Proyek proposal/risalah/makalah/skripsi dinyatakan **BATAL** apabila tidak selesai pada waktu yang telah ditentukan.
3. Masa kadaluwarsa tanggal **:31** Agustus **2025**

Medan 26 Shafar 1446 H
31 Agustus 2024 M

Wassalam
Dekan

Dra. Hj. Syamsuyurnita,MPd.
NIDN : 0004066701

Dibuat rangkap 5 (lima) :
1. Fakultas (Dekan)
2. Ketua Program Studi
3. Pembimbing Materi dan Teknis
4. Pembimbing Riset
5. Mahasiswa yang bersangkutan :

WAJIBMENGIKUTISEMINAR

Appendix 5

MAJELIS PENDIDIKAN TINGGI
UNIVERSITAS MUHAMMADIYAH SUMATERA UTARA
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
Jl. Kapten Mukhtar Basri No. 3 Medan 20238 Telp.061-6619056 Ext, 22, 23, 30
Website: http:/www.fkip.umsu.ac.id E-mail: fkip@umsu.ac.id

بسم الله الرحمن الرحيم

SURAT KETERANGAN

Ketua Program Studi Pendidikan Bahasa Inggris, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Muhammadiyah Sumatera Utara, menerangkan di bawah ini:

Nama Lengkap	: Ardi Bayu
N.P.M	: 2002050085
Program Studi	: Pendidikan Bahasa Inggris
Judul Proposal	: Analyzing EFL Learners Phonological Errors Using Speech Recognition Technology Soundtype AI

benar telah melakukan seminar proposal skripsi pada hari Sabtu, tanggal 26, Bulan Oktober, Tahun 2024

Demikianlah surat keterangan ini dibuat untuk memperoleh surat izin riset dari Dekan Fakultas. Atas kesediaan dan kerjasama yang baik, kami ucapkan terima kasih.

Medan, 26 Oktober 2024

Ketua,

Dr. Pirman Ginting, S.Pd., M.Hum.

Appendix 6

MAJELIS PENDIDIKAN TINGGI
UNIVERSITAS MUHAMMADIYAH SUMATERA UTARA
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
Jl. Kapten Mukhtar Basri No. 3 Telp. (061) 6619056 Medan 20238
Website: http://www.fkip.umsu.ac.id E-mail: fkip@umsu.ac.id

بسم الله الرحمن الرحيم

BERITA ACARA BIMBINGAN PROPOSAL

Perguruan Tinggi : Universitas Muhammadiyah Sumatera Utara
Fakultas : Keguruan dan Ilmu Pendidikan
Jurusan/Prog. Studi : Pendidikan Bahasa Inggris
Nama Lengkap : Ardi Bayu
N.P.M : 2002050085
Program Studi : Pendidikan Bahasa Inggris
Judul Proposal : Analyzing Efl Learners Phonological Errors Using Speech Recognition Technology SoundType AI

Tanggal	Deskripsi Hasil Bimbingan Proposal	Tanda Tangan
5 - Okt - 2024	- Bab I : Identification and Formulation of Problems - Bab III : Scope of Datas	
10 - Okt - 2024	- Bab I : Identification and formulation, objective study. - Bab III : Source of Data.	
15 - Okt - 2024	- Bab I : Formulation and Objectof Study. - References	
16 - Okt - 2024	- References	
22 - Okt - 2024	ACC Seminar Proposal	

Medan, 22 Oktober 2024

Diketahui oleh:
Ketua Prodi

(Pirman Ginting, S.Pd., M.Hum)

Dosen Pembimbing

(Dewi Juni Artha, S.S., M.S.)

Appendix 7

MAJELIS PENDIDIKAN TINGGI
UNIVERSITAS MUHAMMADIYAH SUMATERA UTARA
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
Jl. Kapten Mukhtar Basri No. 3 Medan 20238 Telp. 061-6622400 Ext, 22, 23, 30
Website: http:/www.fkip.umsu.ac.id E-mail: fkip@umsu.ac.id

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

LEMBAR PENGESAHAN PROPOSAL

Proposal yang diajukan oleh mahasiswa di bawah ini:

Nama	: Ardi Bayu
NPM	: 2002050085
Program Studi	: Pendidikan Bahasa Inggris
Judul Artikel	: Analyzing EFL Learners Phonological Errors Using Speech Recognition Technology SoundType AI

Sudah layak diseminarkan.

Disetujui oleh: Ketua Program Studi Pendidikan Bahasa Inggris	Pembimbing
Dr. Pirman Ginting, S.Pd., M.Hum.	**Dewi Juni Artha, S.S., M.S.**

Appendix 8

MAJELIS PENDIDIKAN TINGGI
UNIVERSITAS MUHAMMADIYAH SUMATERA UTARA
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
Jl. Kapten Mukhtar Basri No. 3 Medan 20238 Telp. 061-6622400 Ext, 22, 23, 30
Website: http://www.fkip.umsu.ac.id E-mail: fkip@umsu.ac.id

BERITA ACARA SEMINAR PROPOSAL

Pada hari ini Sabtu Tanggal 26 Bulan Oktober Tahun 2024 diselenggarakan seminar prodi Pendidikan Bahasa Inggris menerangkan bahwa:

Nama Lengkap : Ardi Bayu
N.P.M : 2002050085
Program Studi : Pendidikan Bahasa Inggris
Judul Proposal : Analyzing EFL Learners Phonological Errors Using Speech Recognition Technology Soundtype AI

No	Masukan dan Saran
Judul	✓
Bab I	Background of study, formulation and objective of study
Bab II	Previous research, conceptual framework
Bab III	scope of study
Lainnya	References
Kesimpulan	[ ] Disetujui [ ] Ditolak [√] Disetujui Dengan Adanya Perbaikan

Dosen Pembahas

(Yayuk Hayulina Manurung, S.Pd., M.Pd.)

Dosen Pembimbing

(Dewi Juni Artha, S.S., M.S.)

Panitia Pelaksana

Ketua

(Dr. Pirman Ginting, S.Pd., M.Hum.)

Sekretaris

(Rita Harisma, S.Pd., M.Hum.)

Appendix 9

MAJELIS PENDIDIKAN TINGGI
UNIVERSITAS MUHAMMADIYAH SUMATERA UTARA
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
Jl. Kapten Mukhtar Basri No. 3 Medan 20238 Telp. 061-6622400 Ext, 22, 23, 30
Website: http:/www.fkip.umsu.ac.id E-mail: fkip@umsu.ac.id

بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

LEMBAR PENGESAHAN HASIL SEMINAR PROPOSAL

Proposal yang sudah diseminar oleh mahasiswa di bawah ini:

Nama Lengkap	: Ardi Bayu
N.P.M	: 2002050085
Program Studi	: Pendidikan Bahasa Inggris
Judul Proposal	: Analyzing EFL Learners Phonological Errors Using Speech Recognition Technology Soundtype AI

Pada hari Sabtu, tanggal 26 bulan Oktober, tahun 2024 sudah layak menjadi proposal skripsi.

Medan, 26 Oktober 2024

Disetujui oleh:

Dosen Pembahas	Dosen Pembimbing
(Yayuk Hayulina Manurung, S.Pd., M.Pd.)	**(Dewi Juni Artha, S.S., M.S.)**

Diketahui oleh
Ketua Program Studi,

(Dr. Pirman Ginting, S.Pd., M.Hum.)

Appendix 10

MAJELIS PENDIDIKAN TINGGI PENELITIAN & PENGEMBANGAN PIMPINAN PUSAT MUHAMMADIYAH
UNIVERSITAS MUHAMMADIYAH SUMATERA UTARA
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
UMSU Terakreditasi Unggul Berdasarkan Keputusan Badan Akreditasi Nasional Perguruan Tinggi No. 1913/SK/BAN-PT/Ak.KP/PT/XI/2022
Pusat Administrasi: Jalan Mukhtar Basri No. 3 Medan 20238 Telp. (061) 6622400 - 66224567 Fax. (061) 6625474 - 6631003
https://fkip.umsu.ac.id fkip@umsu.ac.id umsumedan umsumedan umsumedan umsumedan

UMSU
Unggul | Cerdas | Terpercaya
Bila menjawab surat ini agar disebutkan nomor dan tanggalnya

SURAT KETERANGAN

Nomor : 3508/SI/II.3-AU/UMSU-02/D/2024

Bismillahirrahmanirrahim
Assalamu'alaikum Wr. Wb

Dekan Fakultas Keguruan dan Ilmu Pendidikan Universitas Muhammadiyah Sumatera Utara, dengan ini memberikan Izin pelaksanaan Riset Penelitian di Fakultas Keguaruan dan Ilmu Pendidikan Universitas Muhammadiyah Sumatera Utara, tertanggal 04 September s.d. 30 Nopember 2024 kepada :

Nama Mahasiswa	:	Andi Bayu
N P M	:	2002050085
Program Studi	:	Pendidikan Bahasa Inggris
Judul Skripsi	:	Analyzing EFL Learners Phonological Errors Using Speech Recognition Technology Soundtype AI.

Adalah benar mahasiswa Fakultas Keguruan dan Ilmu Pendidikan Universitas Muhammadiyah Sumatera Utara, mahasiswa tersebut di atas aktif mengikuti perkuliahan,

Demikian surat keterangan ini dikeluarkan untuk dapat dipergunakan sebagaimana mestinya. Selamat sejahteralah kita semuanya, Amin.

Medan, 06 Jumadil Awal 1446 H
08 Nopember 2024 M

Wassalam
Dekan

Dr. Hj. Syamsuyurnita, M.Pd.
NIDN: 0004066701

** Pertinggal **

Appendix 11

MAJELIS PENDIDIKAN TINGGI
UNIVERSITAS MUHAMMADIYAH SUMATERA UTARA
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
Jl. Kapten Mukhtar Basri No. 3 Telp. (061) 6619056 Medan 20238
Website: http://www.fkip.umsu.ac.id E-mail: fkip@umsu.ac.id

بسم الله الرحمن الرحيم

BERITA ACARA BIMBINGAN SKRIPSI

Perguruan Tinggi : Universitas Muhammadiyah Sumatera Utara
Fakultas : Keguruan dan Ilmu Pendidikan
Jurusan/Prog. Studi : Pendidikan Bahasa Inggris
Nama : Ardi Bayu
NPM : 2002050085
Program Studi : Pendidikan Bahasa Inggris
Judul Skripsi : Analyzing EFL Learners Phonological Errors Using Speech Recognition Technology SoundType AI.

Tanggal	Deskripsi Hasil Bimbingan Skripsi	Tanda Tangan
20/12/24	Revision problems and objective of the study	
07/01/25	Revision theoritical framework	
15/01/25	Revision types of errors	
21/01/25	Chapter 3, 4 and 5	
07/02/25	Checking and Consulting chapter 3, 4 and 5	
17/02/25	checking and consulting grammatical errors, coherence, and appendixes	
26/02/25	Acceptance for thesis defense	

Diketahui oleh:
Ketua Prodi

(Dr. Pirman Ginting, S.Pd., M.Hum.)

Medan, 27 Februari 2025
Dosen Pembimbing

(Dewi Juni Artha, S.S., M.S.)

Appendix 12

Documentation


AULA

Appendix 13

CURRICULUM VITAE

Name	: Ardi Bayu
NPM	: 2002050085
Gender	: Male
Religion	: Islam
Place/Date of Birth	: Kutacane, 09 May 2002
Address	: Desa Kuta Lang-Lang
Email	: ardibayuuuq@gmail.com

Father's Name	: Ibrahim.B
Mother's Name	: Sumarni

Educational Backgrounds

Elementary School	: SD Swasta Muhammadiyah Kutacane
Junior High School	: SMPS IT Darul Azhar
Senior High School	: SMAN 1 Kutacane
University	: Universitas Muhammadiyah Sumatera Utara