

Articulatory phonetic errors and patterns in Thai BIPA speakers: A study at SWM School Thailand

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ABSTRACT

The tendency for *Bahasa Indonesia bagi Penutur Asing* (BIPA) or Indonesian as a Foreign Language (IFL) speakers' pronunciation errors makes specific patterns from an articulatory phonetic perspective. This approach is still limited, and the competence in pronouncing language is challenging. This study analyzes articulatory phonetic errors of vowels and consonants of BIPA Songserm Wittaya Mulniti (SWM) School Thailand speakers to find their reasons and patterns. This type of qualitative research used the listening-involved-conversation data collection technique as well as the equivalence and distributional analysis methods. The results showed 671 pronunciation errors; 184 vowels and 389 consonants. The majority of vowel errors are double vowels [u_wa], open front [a], and near-close near-back [ɯ] based on the proximity of the tongue positions, movements of the tongue, lip position, and English interference. The majority of consonant errors are apico-alveolar trill [r] and lateral [l], lamino-palatal [ɲ], and dorso-velar [ŋ] based on the articulator and points of articulation, the similarity of the air passages, movement of the vocal cords, interference of air currents, and the interference of another language. The patterns formed were tendencies based on most errors, replacements, omissions, additions, omissions-replacements, replacements-additions, cutting of syllables, and phoneme errors that change the morpheme. Therefore, many errors formed a series of similarities and structured patterns, especially for consonants that had different pronunciation rules from the mother tongue. Practically, this research can help BIPA teachers develop appropriate learning materials and strategies according to the error patterns and characteristics of learners when pronouncing the language.

Keywords: Articulatory phonetics; error patterns; Indonesian as a Foreign Language (BIPA); Thai BIPA speakers; vowels and consonants

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INTRODUCTION

Since 2012, the number of universities in Thailand offering *Bahasa Indonesia bagi Penutur Asing* (BIPA) or Indonesian as a Foreign Language (IFL) courses has been growing to around eight universities (Tawandorloh et al., 2021; Tiawati, 2016). Moreover, some junior and senior high schools in Thailand are also open to BIPA program which is a part of soft-diplomacy building programs (Salamah & Setiawati, 2023). However, Thai students as language users who tend to be

monolingual and use Thai characters instead of the alphabet show obstacles in BIPA learning. This has been proven by previous research which discusses errors in terms of both spoken and written language with various data and approaches that show a series of backgrounds with the greatest influence coming from the mother tongue (Adnyana & Suryaniadi, 2020; Hertiki, 2020; Maulida et al., 2019; Rosalina & Maspuroh, 2023; Wijayanti & Siroj, 2020).

Language is considered a system of sound symbols (Sitepu & Rita, 2017). Therefore,

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pronunciation becomes one of the most prioritized competencies among all language competencies because good pronunciation can support good communication that can lead to a better quality of language competence (Ambalegin, 2021). In practice, however, pronunciation errors caused by slips of the tongue or differences in sound with the mother tongue often occur. Most sound errors occur in groups of sounds that have close articulators or due to the influence of the natural classes. Speakers with many pronunciation errors have difficulty understanding the interlocutor. Realizing this, mastering good pronunciation is considered important for speakers. Thus, it can be concluded that the ability to sound a language should be prioritized over writing it.

The statement mentioned in the previous paragraph is also supported by the relevant government policies. In learning BIPA, Minister of Education and Culture Regulation Number 27 of 2017 stipulates using pronunciation or speaking skills as one of the mandatory competencies (Kementerian Pendidikan dan Kebudayaan, 2017). This regulation strengthens Law Number 24 of 2009 concerning the use of the Indonesian language as the lingua franca of the MEA (ASEAN Economic Community) (Andriyana et al., 2022). Therefore, this paper presents a study of Thai speakers' pronunciation errors in BIPA learning with more data, varieties, and an approach that has never been done before.

Language learning in contextual and interactional settings is an essential individual socialization process to master linguistic conventions (Lu et al., 2021). In teaching BIPA to Thai speakers, students in each level of formal education generally do not know Indonesian at all (Jati, 2016), while the core of all multilingual acquisition disciplines is the concept of cross-linguistic transfer (Zen, 2020). In this condition, language transfer can occur, in which speakers use the linguistic elements of their first language when pronouncing a word (Pariyanto et al., 2019). Hence, cultural background, including mother tongue interference and speakers' lack of understanding, significantly influence language learning (Jannah & Khaerunnisa, 2022).

The limited Indonesian language skills of BIPA learners can influence the performance of language use (Kusuma & Kayati, 2023). The common language error among novice foreign speakers is at the phonological or pronunciation level, where the phonological differences between the mother tongue and the target language become an obstacle for learners (Fadly, 2022; Maharani et al., 2021). On the other hand, Prihatiningtyas and Mardikarno (2015) argued that if the pronunciation is not well mastered, native speakers can have difficulty understanding what foreign speakers mean. Thus, it is possible that there is also a

misunderstanding regarding the assumption that mistakes are truths arising out of habit (Sa'diyah & Izhatullaihi, 2017).

For more than a century, articulatory phonetics, as part of the study of phonology, has been considered an applied linguistics discipline for practical purposes, including language teaching (Xiaonong & Wright, 2015). What sets this approach apart from other approaches to spoken language is the aim of integrating the cognitive and physical aspects of speech into one unified theory (Browman & Goldstein, 1986, 1989; Byrd & Saltzman, 2003; Fowler et al., 1980; Iskarous & Pouplier, 2022; Saltzman & Munhall, 1989; Tilsen, 2019). In the study of articulatory phonetics, the place and manner of articulation indicate the settings and actions of the articulator or speech organs during the production of speech sounds (Ji et al., 2017).

A previous study that can support this research is the research of Maulida et al. (2019), which examined the mispronunciation of Thai-speaking Indonesian vocabulary at IAIN Tulungagung. The difference between the previous research above and this research is the method of data analysis and data variations. Maulida et al. (2019) carried out analysis through the process of composing syllables and marking the wrong parts without providing further phonological explanation. Then, the background of pronunciation errors tends to highlight internal and external factors of the speaker instead of taking a linguistic point of view. The data and patterns produced are also still quite limited. In this research, more data and variations were taken to obtain an accurate pattern. Thus, the main difference lies in the analytical theory used, namely an articulatory phonetic review to reveal the phenomenon of language pronunciation errors from the perspective of the language itself or that of linguistics.

There are also other BIPA Thailand research, the majority of which focus on writing competency errors, for example, research on written language errors of BIPA students at UIN Sunan Kalijaga (Herniti, 2017), Yale University USA (Siagian, 2017), Southern Thailand (Pariyanto et al., 2019), Muhammadiyah University of Sukabumi (Jovita et al., 2019), Maejo University of Thailand (Hertiki, 2020), Polytechnic State of Bali (Adnyana & Suryaniadi, 2020), Yogyakarta Language Center (Wijayanti & Siroj, 2020), and Singaperbangsa Karawang University (Rosalina & Maspuroh, 2023). Most of the studies above do not analyze the errors linguistically such as morphological or syntactic errors, but tend to highlight errors in general, for example spelling errors compared to dictionaries. Therefore, this research is intended to analyze the pronunciation errors of Thai learners of BIPA based on an articulatory phonetic review and the tendency of errors that occur in its structured patterns.

Investigating and mapping articulatory phonetic errors and patterns in Thai BIPA speakers becomes important to identify the tendencies of pronunciation errors more precisely down to the most accurate and basic level, namely the influence of the articulatory organs. Further, the study of articulatory phonetic errors may significantly help teachers understand which errors require more intensive learning practice, and prepare more appropriate and accurate learning materials because pronunciation errors need to be corrected as soon as possible before fossilization occurs (Naufalia et al., 2021). Naturalizing individual BIPA learners like native speakers is a challenge for BIPA teachers in their classes (Lindayani, 2020). Initial observations also show that according to their grades, Thai students do not seem to perform better when speaking in Indonesian language than when writing since they produce a wide range of errors and slips of the tongue, especially in pronouncing words.

Based on the explanation above, therefore, this research focuses more on pronunciation rather than writing characters because it is considered more challenging for Thai speakers. Practically, this research may help BIPA teachers develop appropriate learning materials and strategies according to learner characteristics, especially as a matter of fact that SWM School is still hampered by the lack of availability of BIPA learning materials (Fatahillah, 2020). Theoretically, this research has a great opportunity to encourage the success of Indonesian language internationalization efforts. BIPA can be used as capital to strengthen Indonesia's image, media diplomacy, and soft power (Darma et al., 2018). Moreover, the study of articulatory phonetics within the scope of Indonesian language learning is still limited, and the competence in pronouncing language sounds is challenging for both teachers and learners. The selection of pronunciation errors in this study is based on the most basic and common errors that can be found in beginner to intermediate-level BIPA speakers. Hence, this study is oriented to three aspects; articulatory phonetic errors in vowels; those errors in consonants; and the mapping of patterns based on pronunciation errors.

METHOD

Research Designs

This research was descriptive research using the articulatory phonetics approach. The qualitative type refers to the nature of the research since sounds is the central phenomena being the data (Creswell, 2012; Asdar, 2018). The articulatory phonetics approach examines the sounds of language, the formation process, and their changes (Lafamane, 2020), that also connect with the physical mechanisms (Huffman, 2016; Mücke et al., 2020).

Data Collection

This research was a field study that took place at โรงเรียนสงเสริมวิทยามูลนิธิ (Songserm Wittaya Mulniti School), Hat Yai, Thailand. This study was conducted for 27 days. The data in this study were audio recordings of the pronunciation of Thai BIPA speakers at SWM School, the transcriptions of speech texts based on audio recordings, as well as the interview transcripts and ethnographic notes obtained directly from the involvement of researchers with data sources.

The method of collecting data in this study was the listen-involved-talk method (Sudaryanto, 2015). This method refers to the researchers' involvement in the conversations or communications through data sources. The researchers had a role as a communication participant, both actively and passively, as a teacher in the classroom, and as a friend on the outside. This study focused on the academic community, particularly junior and senior high school students at Songserm Wittaya Mulniti School, with a total of 714 students involved. The data collection process was carried out in 3 to 4 meetings for each student. Then, each student had about 4 minutes to record the data. The age range of the students involved in this study was between 13-18 years old. Hence, the recordings were not only limited to the classroom interactions and tasks, but also activities outside the classroom such as in the canteen or prayer room.

To obtain more varied data, interviews were conducted with teachers as emic people to gain more perspectives on the students' language learning habits. The interviewees selected to support the analysis were adjusted to background and research objectives (Lenaini, 2021). The collected data underwent series of reduction processes to identify the main patterns that match the research focus (Miles & Huberman, 2014). Hence, up to 671 pronunciation errors were identified, consisting of 184 vowel errors and 389 consonant errors. Thus, the phonetic transcript, which is the final data of this study, can be accessed at the following link <https://bit.ly/DataFA-SWM23>.

Figure 1

QR Code to Access Phonetic Transcript Data



Data Analysis

The data analysis method used in this study was matching and distribution method (Sudaryanto, 2015). One of the branches of the equivalent method

is the articulatory phonetic equivalent in which the determining device refers to the speech organ. Regarding the formation of specific lingual units, the speech organs could differ in activating their parts. The sorting power possessed by researchers was used to distinguish it. The distributional method determining tool was the language in question. The basic technique applied was the dividing technique for direct elements with advanced techniques in the form of replacement techniques by replacing elements of a lingual unit with other elements outside the lingual unit to test the accuracy of the sound of pronunciation. Furthermore, to strengthen the analysis results, there were a series of references to relevant literature sources (Zed, 2018). Hence, the

data validity test used the techniques of increasing persistence, triangulation, peer review, and expert validation (Mekarisce, 2020).

FINDINGS

Articulatory phonetic studies are broadly related to consonants and vowels (segments) as well as types of tones and phonations (Xiaonong & Wright, 2015). In this study, the pronunciation errors of BIPA SWM School Thailand speakers were mapped based on the types of vowel errors and consonant errors. As mentioned previously, the findings in this study show a total of 671 pronunciation errors

Table1
Vowels Articulatory Phonetic Errors

Phoneme	Changes	Amount
Open front unrounded [a]	[ə],[ɔ],[u],[ε],[a ^h],[^d a]	27
Close front unrounded [i]	[u],[ε],[a _y],[l],[ə],[a]	15
Close back rounded [u]	[a],[y _u],[ε]	10
Mid front unrounded [e]	[ə]	2
Mid central unrounded [ə]	[i],[ε],[a],[o]	15
Open-mid front unrounded [ε]	[ə],[e],[a]	3
Open-mid back rounded [ɔ]	[u],[a]	4
Near-close near-back rounded [ɔ]	[a],[ə],[ε],[ɔ],[o]	18
Double vowels [aa]	[a]	1
Double vowels /ai/[a _y i]	[ε],[a],[ai]	13
Double vowels /au/[a _w u]	[aa],[u _w a],[au]	9
Double vowels /eu/[ε _y u]	[i]	1
Double vowels /ia/[i _y a]	[a _y i],[i],[ia]	16
Double vowels /ua/[u _w a]	[a _w u],[u _w o],[uu],[u],[a]	32
Double vowels /ui/[u _w i]	[a _y i],[a _w u],[u _w ai],[u]	4
Diphthong /ai/[a _y]	[i],[a]	2
Diphthong /au/[a _w]	[u-a],[ə],[i],[u _w a],[a],[u],[t],[a [?]]	12
Total		184

Table 2
Consonants Articulatory Phonetic Errors

Phoneme	Changes	of Errors
Bilabial [b]	[p],[m],[d],[k]	17
Bilabial [m]	[b],[p],[r],[-]	5
Bilabial [p]	[b],[m],[d],[t],[h]	25
Apico-dental [d]	[t]	1
Apico-dental [t]	[d],[l],[r],[s],[b],[p],[k],[ŋ],[ʔ]	18
Apico-alveolar [d]	[b],[l],[r],[s],[t],[k]	12
Apico-alveolar [l]	[w],[:],[n],[r],[t],[b],[j],[-]	35
Apico-alveolar [n]	[w],[l],[ŋ],[t],[m],[ʔ],[-]	25
Apico-alveolar [r]	[l],[t],[:],[s],[h],[ŋ],[k],[n],[y],[-]	83
Apico-alveolar [s]	[t],[h],[l],[f],[k],[:]	13
Apico-alveolar [z]	[s]	2
Lamino-palatal [c]	[k],[h],[f],[s],[g]	11
Lamino-palatal [j]	[y],[c],[s],[ʃ]	8
Lamino-palatal [ŋ]	[j],[y],[n],[ŋ],[ʔ],[l],[-]	31
Lamino-palatal [y]	[j],[ŋ]	6
Dorso-velar [g]	[j],[k],[ŋ],[d]	24
Dorso-velar [k]	[h],[g],[t],[j],[c],[l],[-]	15
Dorso-velar [ŋ]	[n],[k],[g],[ʔ],[t]	30
Glottal fricative [h]	[n],[b],[ʔ],[n],[t],[m],[-]	26
Glottal stop [ʔ]	[ŋ],[h]	2
Total		389

Based on the findings above, it can be identified that the most articulatory phonetic errors involve the apex and alveolum organs that are likely due to differences in language articulation rules. In addition to double letters which are rarely heard, there are also many errors found. Then, common vowel pronunciation errors occur in the double vowels [u.wa] (32), open front unrounded vowel [a] (27), near-close near-back rounded vowel [ɔ] (18), and double vowels [ia] (16) based on the proximity of the tongue positions, tongue movements, lip position, and English language interference. In contrast, consonant errors are common in apico-

alveolar [r] and [l] (35), lamino-palatal [ɲ] (31), and dorso-velar [ŋ] (30) based on the articulator and points of articulation, similarity of air passage, movement of vocal cords, interference of air currents, as well as the interference of mother tongue and English. Referring to the two tables above, to facilitate the process of identifying patterns of pronunciation error tendencies based on the number of frequencies, the frequency range markers are made on the International Phonetic Alphabet (IPA) chart which are given color levels according to the number of errors.

Figure 2
Vowels Phoneme Error Frequency

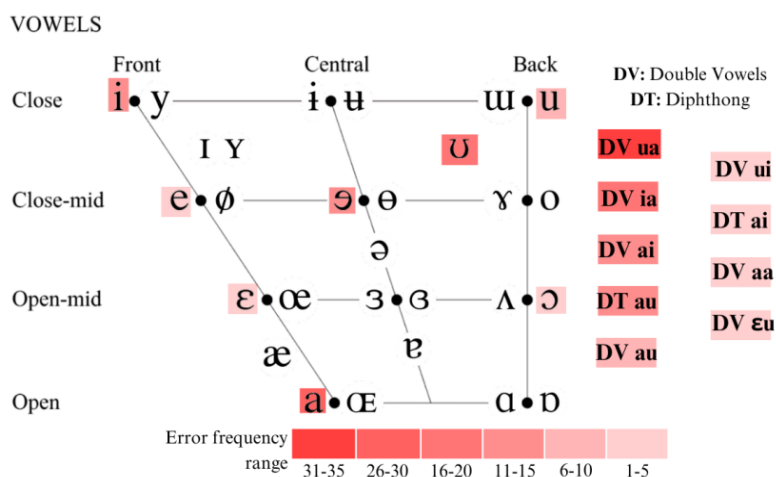
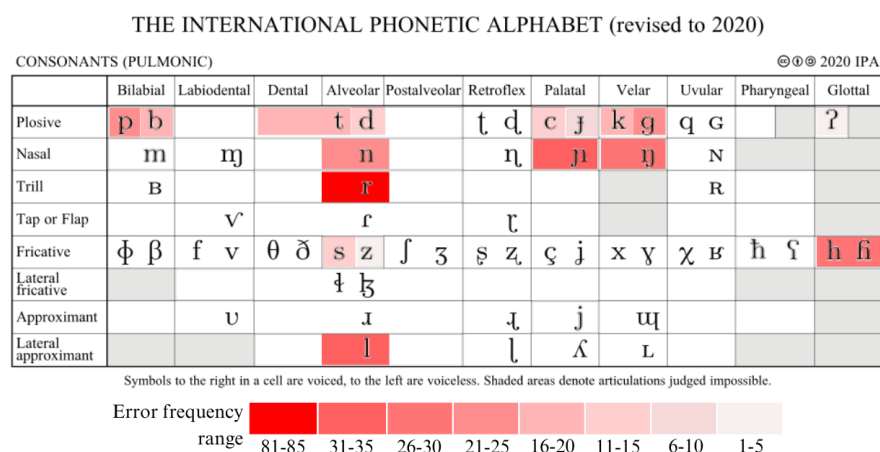


Figure 3
Consonant Phoneme Error Frequency



DISCUSSION
Vowels Articulatory Phonetic Errors of Thai BIPA Speakers at SWM School Thailand
Open Front Unrounded [a]

The change in the sound of the phoneme [a] to [ɛ] and [ɔ] can be due to the similarity in the height of the tongue, between the low vocoid and slightly lower vocoid sound groups where the pronunciation is both formed when the lower jaw is pushed back as far as possible. Then, the [ɛ] phoneme also has a

similarity in the sound produced based on the ups and downs of the front of the tongue. The background of the change of the sound of the phoneme [a] to sound [ɛ] could be due to interference from English which sounds the phoneme /a/ like the sound of the phoneme [ɛ]. The change of phoneme [a] into another sound could be due to the influence of the speaker's unfamiliarity with the alphabetic script itself, considering that speakers use Thai script more in

their daily lives, or could also be due to the appearance of the aspirate sound out of place resulting in unnecessary shadow sounds. This claim aligns with Jazeri (2013), which states that before learning Indonesian, BIPA learners had learned Thai as their mother tongue and English as another foreign language studied so that the language system they had mastered can affect the one they have just learned.

Close Front Unrounded [i]

The mistake of the phoneme [i] to become [a_y] can also be caused by interference from English which sounds the letter /i/ to become [a_y]. The change to the phonemes [ɛ] and [a] is because of the similarity in the movement of the ups and downs of the front of the tongue, and based on the position of the lips, the lips are in stretched, not rounded shape. The change to [u] could be due to the similarity as a high vocoid sound where the pronunciation is formed when the lower jaw is close to the upper jaw. Then, the change to [ə] is because of the proximity in the high and low of the tongue, between the class of high position (close) vocoid and mid-high vocoid (close-mid). On the other hand, the change to phoneme [l] is probably because of the shape of the letter /i/ when written with a capital letter /I/; it has a similar shape to the shape of the letter /l/.

Close Back Rounded [u]

The mistake in pronouncing the sound of the phoneme [u] to the phoneme [y_u] is probably because of the interference in the English language, which pronounces the letter /u/ as [y_u]. That also applies to changes in the sound of the phoneme [u] to [a] when it is in a closed syllable, for example, in the word /but/ pronunciation as [bat]. The change in the sound of the phoneme [u] to the sound of the phoneme [ɛ] found in one error data could affect by the speaker's unfamiliarity with the letters of the alphabet, so they replaced it with another phoneme sound. Thus, it can be concluded that errors in the pronunciation of the phoneme sound [u] of Thai BIPA speakers are because of English interference and the speakers' unfamiliarity with the alphabet.

Mid Front Unrounded [e]

The mistake in pronouncing the sound of the phoneme [e] into phoneme sound [ə] is because of the similarity in the movement of the high and low tongue, the middle vocoid sound class where the pronunciation is forming when the lower jaw moves away slightly from the upper jaw and if based on the position of the lips, the lips are in an open form, not rounded. Hence, the difference between the two sounds is the ups and downs of the tongue. The phoneme [e] emphasizes moving up and down the front of the tongue, while the phoneme [ə] emphasizes moving up and down the middle of the tongue. Thus, the pronunciation error of the

phoneme [e] can be caused by the similarity of the tongue's high and low movements and the lips' position.

Mid Central Unrounded [ə]

The mistake in pronouncing the phoneme sound [ə] into the phoneme sound [ɛ] is because Thai BIPA speakers have difficulty distinguishing variations of the letter /e/. It is because the letter /e/ in the Thai script has different variations. Furthermore, the pronunciation of the sound of the phoneme [ə] to become the sound of the phoneme [o] could be because there is a similarity in the height and low of the tongue, the class of middle vocoid sounds where the pronunciation is forming when the lower jaw moves away slightly from the upper jaw. Then, the error in becoming phoneme [i] may be due to the background English interference that pronounces the letter /e/ with the letter /i/ with a sound similar to the phoneme [i]. Finally, the change in the sound of the phoneme [ə] to phoneme [a] in the word [pəɾəmpu_wan] changed to [pəɾəmpu_wan] is probably because of difficulties in pronouncing words consisting of four syllables.

Open-Mid Front Unrounded [ɛ]

The mistake in pronouncing the phoneme sound [ɛ] into the phoneme sound [ə] or [e] is also because Thai BIPA speakers have difficulty distinguishing variations of the letter /e/ in Indonesian, which consists of [e], [ə], [ɛ]. Furthermore, the change in the sound of the phoneme [ɛ] to the sound of the phoneme [a] is because of the similarity in the movement of the ups and downs of the front of the tongue and based on the position of the lips, the lips are in an open shape, not rounded. Hence, it can be concluded that the pronunciation errors in the phoneme sound [ɛ] can be caused by the similarity of the up and down movement of the tongue and the position of the lips as well as the difficulty of Thai BIPA speakers in distinguishing the variations of the letter /e/.

Open-Mid Back Rounded [ɔ]

The mistake in pronouncing the sound of the phoneme [ɔ] into the sound of the phoneme [u] is due to the similarity in the ups and downs of the back of the tongue and the position of the lips in pursed or rounded lips. Furthermore, the change to phoneme [a] is due to the proximity in the height of the tongue, between the class of vocoid sounds in a slightly lower position (open mid) and low vocoid (open), where the pronunciation is both formed when the lower jaw set back far enough but not as far front vocoid sound. Hence, it can be concluded that the pronunciation errors in the phoneme sound [ɔ] can be caused by the similarity of the ups and downs of the tongue as well as the position of the lips and the proximity of the high and low tongues.

Near-Close Near-Back Rounded [ɔ̃]

The mistake in pronouncing the sound of the phoneme [ɔ̃] into phoneme [a] is caused by interference from English which pronounces the letter /u/ as [a] in closed syllables. Furthermore, changes in the phoneme [u] to [ɛ] and [ə] found in one error data could be due to the speaker's unfamiliarity with the alphabetical letters, so they replace them with other phoneme sounds. The change in the sound of the phoneme [ɔ̃] into phoneme sounds [ɔ] and [o] is due to the similarity in the ups and downs of the back of the tongue or the base of the tongue and the position of the lips rounded. Therefore, it can be concluded that pronunciation errors in the sound of the phoneme [ɔ̃] can be caused by the interference of English, similarities in tongue movements and lip positions, congenital sounds from the previous phoneme, and the speaker's unfamiliarity with the alphabetic script itself.

Double Vowels

Double vowel sounds are vowel sounds that are lined up but separated by segments or syllables. The separation of syllables distinguishes it from diphthongs, where in the double vowel sound between the first and second vowel phonemes are in separate syllables. One variation of the error is the omission of the accompanying sound in the double vowels [a_yi] and [a_wu]; for example, the word /naik/ [na_yik] becomes /na-ik/ [naik] and /berdaun [bərda_wun] becomes /berda-un/ [bərdaun], this is due to the inability of speakers to determine the accompaniment sound [y] or [w] when switching between segments or syllables from one to the next. Hence, it also applies to phoneme errors [i_ya] and [u_wa] which omit the accompanying sound [y] or [w] when switching segments.

The mispronunciation of the double vowel sound [ai] to the phoneme sound [ɛ] is probably due to interference from English, where words containing the phoneme /ai/ sound similar to [ɛ], for example, in the word /straight/. Likewise, the phoneme /eu/ [ɛ_yu] in the word [muse_yum] (Indonesia version), which gets interference from English, where the letter /e/ is pronounced similarly to the sound of the phoneme [i] becomes [musi_yum]. The speaker also replaces one phoneme to become another phoneme, for example, with a previous phoneme like [au] to [aa], with a phoneme after it like [u_wa] to [uu], or it can also change partially like [u_wa] to [u_wo]. Another mistake made is removing one of the phonemes without replacing it with another phoneme; for example, [a_yi] becomes [a], [i_ya] becomes [i], [u_wa], [u], et cetera, or it could be a pronunciation error due to phoneme exchange. For example, the phoneme [a_wu] becomes [u_wa], [i_ya] becomes [a_yi], [a_yi] becomes [i_ya], et cetera. These things can be caused by the speaker's unfamiliarity with the double letters in the alphabet.

Diphthong

The sound of a diphthong comes out in one slide without separate segments or syllables. Variations of errors that arise include removing one of the phonemes so that only one phoneme is left; for example, the phonemes /ai/ [a_y] become [i] and [a], /au/ [a_w] become [a] and [u]. Then, there are variations in errors in the form of substituting into other phonemes and variations in the form of phoneme reversals, such as [a_w] to [u_wa], and errors in cutting syllables out of place. In the first, second, and third variations of errors, the speakers may have difficulty pronouncing double letters as a background, so they are prone to making errors in removing, substituting, or changing font positions. Then, the fourth variation error may be because speakers are unable to determine segment pieces.

Based on all the explanations above, it can be concluded that the vocal pronunciation errors of BIPA SWM School Thailand speakers can be caused by similarities or proximities in the height and fall of the tongue, the movement of parts of the tongue when going up and down, to the position of the lips in pronouncing phonemes. In addition, there is also the influence of interference from English as another foreign language studied. This claim is in line with Nasution (2019), which states that variations in the form of BIPA errors can be caused by the pronunciation of Indonesian words that are different from the source language or the listening heard is considered too fast. It is also supported by Jannah and Khaerunnisa (2022) who argue that language learning errors are influenced by interference in the mother tongue which is mastered first; the speaker's lack of understanding of the target language studied could also be due to inappropriate teaching.

Consonants Articulatory Phonetic Errors of Thai BIPA Speakers at SWM School Thailand

Bilabial

Mistakes in the majority of the bilabial sounds [b] [m] and [p] change to the same bilabial sounds. This change is due to the similarity of sounds produced by speech organs because they have the same articulators and points of articulation; the upper labium (lips) and the lower labium. The change from bilabial [b] to apico-alveolar [d] has two possibilities. First, speakers still need to familiarize themselves with the letters of the alphabet and find it challenging to distinguish the shapes of the letters /b/ and /d/. Second, the articulator phoneme [b], labium or lips, is adjacent to the articulator phoneme [d], the apex or tip of the tongue.

On the other hand, the change from bilabial [m] to apico-alveolar [ɾ] can also be due to the same reason. In contrast, in the case of the omission of the phoneme [m], it is possible that BIPA speakers are still unfamiliar with the pronunciation of letters of the alphabet or because of similarities in the type of

movement, the vocal cords are dead or voiceless sounds with air passages in the form of oral sounds. Apart from that, there are also changes in the bilingual [p] to apico-alveolar [d], apico-dental [t], and glottal fricative [h] sounds. The change from phoneme [p] to phoneme [d] and [t] is due to the articulator phoneme [p], labium, adjacent to the articulator phoneme [d] and [t], apex. In contrast, in the case of the change in phoneme [h], it is also possible that it is due to similarities in the type of vocal cord movement of dead sound with air passage holes in the form of oral sounds.

Apico-Dental

The change from an apico-dental [d] sound to an apico-dental [t] sound is due to the similarity of the sounds produced by the speech organs because they have the same articulator and point of articulation, the apex (tip of the tongue) as an active articulator and the dentum (upper teeth) as a passive articulator or point articulation. Furthermore, the change from apico-dental [t] to apico-alveolar [d], [l], [r], and [s] can be due to the similarity of sounds produced by the same active articulators, the apex, and the proximity of passive articulators namely the dentum with the alveolum (base of the upper teeth). That also applies to changes in the apico-dental [t] to bilabial [b] and [p]; the apex is close to the labium, whereas the change to a dorso-velar [k] sound can be due to the similarity in the type of vocal cord movement, namely the sound of death with air passage hole in the form of oral sound. The mistake of the phoneme [t] becoming phoneme [ŋ] in the word [raʔyat] which changed into [raʔjyaŋ] could be due to the difficulties experienced by Thai BIPA speakers ending words with plosive sounds.

Apico-Alveolar

The change from apico-alveolar [d] to apico-alveolar [l], [r], and [s] can be due to the similarity of sounds produced by the speech organs because they have the same articulator and point of articulation, the apex (tip of the tongue) as the articulator active and the alveolum (base of the upper teeth) as the point of articulation. The change from apico-alveolar sound [d] to apico-dental [t] can be due to the similarity of the active articulator and the adjacent passive articulator, the alveolum and the upper dentum (tooth). That also applies to changes in the apico-alveolar [d] to bilabial [b]; the apex is close to the labium, whereas the change to a dorso-velar [k] sound can be due to the similarities in the air passages in the form of oral sounds and the category of ways of interrupting the flowing air is a plosive sound.

The exchange of apico-alveolar sounds [l], [n], [r], and [s], which replaces one another, can be due to the similarity of speech organs and changes in phonemes [l], [n], and [t] to the apico-dental [t] can be due to the similarity of the active articulator,

namely the apex, and the adjacent passive articulator, the alveolum and the dentum. That also applies to the change to a bilabial [b] or semi-bilabial [w], namely the active articulator apex adjacent to the labium (lips). In contrast, the change to a lamino-palatal sound [j] is probably due to the proximity between the apex with the lamina (middle of the tongue) as the active articulator and the alveolum with the hard palate as the passive articulator.

The reason for the mistake being a sound that sounds unclear [ʔ] or even wholly lost can be due to differences in the pronunciation system of the phoneme [l] in BIPA and Thai. Phonemes /l/ and /r/ (Thai script: ล and ร), which in Indonesian sound like [l] and [r] both at the beginning and at the end of a word, but in Thai, they sound like [l] or [r] at the beginning and [n] at the end. The various types of language rules in foreign countries allow international students to get used to the sounds of the language they previously learned so that when there are additions of different sounds in Indonesian, it can affect their ability to learn the language or, in other words, they are hampered by the habits of their mother tongue (Akyun, 2020).

The change from apico-alveolar [n] to bilabial [m] or semi-bilabial [w] occurs due to the active articulatory apex being adjacent to the labium. Similarly, the change to phoneme [ŋ] is motivated by the similarity in how air currents are disrupted by the articulators when sounds are pronounced. Errors in pronouncing phoneme [n] as glottal sound [ʔ] or missing it altogether occur due to at least six variations of pronunciation rules for letter /n/ in Thai.

The error in pronouncing apico-alveolar [r] sound as lamino-palatal [y] is because the active articulators of the apex are adjacent to the lamina, while passive articulator of alveolar is adjacent to palate. On the other hand, errors in changing it into dorso-velar [ŋ], glottal fricative sound [h], unclear sound [ʔ], or no sound at all occur due to difficulty and unfamiliarity with this phoneme among BIPA SWM School Thailand speakers. This tendency can also be attributed to English interference where [r] is pronounced as [ʔ].

In the changes of sound, the phoneme [s] becomes phoneme [f] and [h], and phoneme [z] becomes [s]. It may be influenced by the interference of air currents where both of them are classified as fricative sounds, produced by the airflow is inhibited in such a way that the air can still come out and produce a hissing sound. In contrast, the change to [k] may be influenced by the air passage, which is the same as the oral sound that appears by way of air coming out through the oral cavity with closes the velic on the pharyngeal wall (Muslich, 2018).

Lamino-Palatal

There is a change from the same lamino-palatal sound, namely phoneme [c] to [ʃ], phoneme [j] to [ç], [ʃ] and [y], phoneme [ɲ] to [ʃ] and [y], phoneme [y] becomes [j] and [ɲ] due to the similarity of the speech organs, the lamina (middle of the tongue) as the active articulator and the palate (hard palate) as the articulation point or passive articulator. However, in the case of a mistake in the sound of the phoneme [y] to become phoneme [j], based on the emic interview, this can occur due to the influence of the speaker's native language where words written with phoneme [j] read as phoneme [y]. The change from lamino-palatal to apico-alveolar sounds, namely the phonemes [c], [j], and [ɲ] to [s], [y], [n], and [l], is due to the influence of the proximity of the articulators active namely the apex (tip of the tongue) with the lamina and the point of articulation namely the alveolum (base of the upper teeth) with the hard palate. In addition, based on emic interviews, Thai speakers do not recognize the sound /ny/ [ɲ], so the difficulties they experience make speakers omit one of the phonemes in phoneme /ny/, removing the phoneme /y/ and only pronouncing the phoneme /n/ so that it only sounds sound [n].

The change from the lamino-palatal sound [c] to the dorso-velar [k] is due to the interference of the English sounding of the letter /c/ with the sound of the phoneme [k]. On the other hand, the change of phoneme [c] to dorso-velar [g], based on emic interview, is probably due to influence from the mother tongue (Thai language), where phonemes [c] and [g] often replace each other due to the absence of these two phonemes in Thai, whereas the replacement of phoneme [c] to phoneme [h] could be due to the absence of the letter /c/ but the letter /ch/ (๑) in the Thai script. On the other hand, the change of [ɲ] to dorso-velar [ŋ] is due to two possibilities, firstly the similarity of the air passages and the way air currents are disturbed, namely nasal sounds, secondly due to the influence of the speaker's mother tongue. As the direct interview of previous Thai speakers, the phoneme /ny/ [ɲ] is not recognized in Thai script, so there is a tendency to change it into a phoneme that looks or sounds similar, namely phoneme /ng/ (๑) [ŋ].

Dorso-Velar

The change from dorso-velar [g] to dorso-velar [k] and [ŋ] and vice versa is because of the similarity of sounds produced by speech organs with the same articulators and points of articulation. The change from dorso-velar sound [g] and [k] to lamino-palatal [j] and [ç] could be due to the influence of the proximity of the active dorsum articulator (back of the tongue) to the lamina (middle of the tongue) and the point of articulation of the velum (sky-soft palate) with the palate (hard palate), or could also be due to the interference in English language. The

change to phoneme sounds [d] and [t] can be based on the similarity in the way air currents are disturbed by the articulator, namely, plosive sound category, and similarity in air passage in form of oral sounds in change to phoneme [l].

The phoneme /k/ [k] becomes /kh/ [kʰ] due to the interference from mother tongue which has five characters (ข, ฃ, ค, ฅ, ฆ) that can be pronounced as /kh/ or /k/ depending on placement. These differences in linguistic conventions affect speakers in the process of language transfer. Problems with phoneme /ng/ [ŋ], which is sounded by removing one of phonemes to be /n/ [n], can also be caused by speaker's difficulty in producing words with double letters.

Glottal Fricative

Most errors in the glottal fricative [h] sound, as much as 88%, occur when the sound [h] is at the end of a word. There are two classifications of errors broadly based on the motion of the vocal cords. The majority of the first grouping is replacing the sound [h] as a dead sound with another dead sound, for example, the phoneme [ʔ] or [t]. An error can occur in the phoneme change [ʔ] because both phonemes involve the glottis in sound production. The second group changes the living sound. Thai speakers with difficulty ending words with a dead sound tend to replace them with a living sound, especially the nasal [n] and [m] sounds. In Thai, many non-nasal phonemes change to nasal sounds at the end of words.

Glottal Stop

In the error of the glottal stop [ʔ] sound, two phoneme changes were found; a dorso-velar nasal sound [ŋ] and a glottal fricative sound [h]. Changes to the phoneme [h] may be influenced by the air passages, which are the same as oral sounds that appear by way of air escaping through the oral cavity by closing the vesicles on the pharyngeal wall; errors can also occur because the two phonemes both involve the glottis in the production sound, while the change to the phoneme /ng/ [ŋ] can be caused by interference from the mother tongue where in Thai many non-nasal phonemes are changed to nasal sounds when they are at the end of a word.

The study concludes that consonant errors can occur due to various factors such as the similarity of articulators and points of articulation, air passages, vocal cords movement, and air currents disturbed by the articulators. In addition, language interference from the speaker's mother tongue or other languages studied can also contribute to these errors due to emic interview. Indonesian is classified as a phonetic language, a language that has a direct relationship between spelling and pronunciation (Karlina et al. 2020), but Thai is not.

The claim of this research is also in line with previous studies which state that the perception of non-native phonemes is influenced by language at the phonological and phonetic levels. Learners may struggle to identify and differentiate between phonological contrasts that do not exist in their native language. For example, Thai BIPA speakers find it challenging to pronounce certain Indonesian phonemes such as /sy/ [ʃ], /ny/ [ɲ], /j/ [j], and /z/ [z]. Even when contrasts exist in a foreign language, differences in phonetic realization can also affect perception. For instance, the letters /l/ and /r/ are pronounced as [n] in Thai, but not in Indonesian. These findings align with previous studies on the subject (Best & Strange, 1992; Chen et al., 2023; Hallé et al., 1999).

Patterns of Articulatory Phonetic Errors from Thai BIPA Speakers at SWM School Thailand

The patterns found in previous research include patterns of changing, adding, and replacing phonemes (Lathifah et al., 2021), patterns of adding, subtracting or removing, and changing phonemes (Agustina & Oktavia, 2019; Maharani et al., 2021; Setiawaty et al., 2019), as well as interference patterns of vowels, consonants, additions, and removal of phonemes (Adityarini et al., 2020). However, the patterns that can emerge in this study are more varied, including (1) tendencies based on the majority of errors, (2) replacements, (3) omissions, (4) additions, (5) omissions and replacements, (6) replacements and additions, (7) cutting of syllables out of place, and (8) phoneme errors to change the morpheme partially and totally.

Patterns Based on Majority of Phoneme Pronunciation Errors

BIPA speakers at SWM School Thailand who have little language experience beyond their mother tongue and use the Thai script struggle to adapt to the alphabet. Novice and experienced speakers alike make mistakes on certain phonemes, particularly apico-alveolar sounds which involve the tip of the tongue and base of the upper teeth. The most error-prone apico-alveolar sounds are trill [r] (83) and lateral [l] (35). Furthermore, BIPA speakers also struggle with double vowels, especially in the phoneme [ua], resulting in errors with the lamino-palatal /ny/ [ɲ] (31) and dorso-velar [ŋ] (30). Expert-level foreign speakers also report difficulties recognizing, reading, and pronouncing letters of the alphabet, particularly when dealing with multiple letters.

Phoneme Replacement

Foreign speakers often substitute phonemes when correcting errors in their pronunciation. The most common sound replacement is the apico-alveolar sounds [r] and [l]. There are various reasons for this pattern of substitution, including similarities in tongue level, movement of the tongue, position of

the lips, proximity of articulators and points of articulation, similarity of air passage, movement of vocal cords, interference with air currents by articulators, and interference with the speaker's mother tongue or English as a second language.

Table 3

Sample of Phoneme Replacement

Correct	Error	Replace
[pəmbəli]	[pəmbili]	[ə] → [i]
[məŋgələŋ]	[məŋgələŋ]	[ɛ] → [ə]
[hijaw]	[hijat]	[a _w] → [at]
[api]	[abi]	[p] → [b]
[məraʔ]	[məraŋ]	[ʔ] → [ŋ]

Phoneme Omission

Phoneme omission errors are mostly common in morphemes with three or more syllables and those containing certain sounds, such as [l], [r], [n], and [ŋ]. However, other sounds like [h], [a], and [i] may also be affected. These errors tend to occur in final or closed syllables. Speakers at BIPA SWM School Thailand struggle with pronouncing morphemes with more than two syllables and apico-alveolar, nasal, and double letter sounds based on field observations and emic interviews. This claim is in line with Adityarini et al. (2020) research, which stated that omission errors for BIPA students' sounds are common in middle and final syllables, both open and closed syllables.

Table 4

Sample of Phoneme Omission

Correct	Error	Remove
[səkəliliŋ]	[səkəliŋ]	[l] [i]
[suwara]	[sura]	[a]
[kəcil]	[kəci]	[l]
[bərdawun]	[bərdawu]	[n]
[səpərti]	[səpəti]	[r]

Phoneme Addition

The addition of the majority phoneme pattern is observed in morphemes with more than two syllables, rare phonemes like [c], and nasal letters such as dorso-velar [ŋ]. Ethnographic notes and emic interviews suggest that the phoneme [ŋ] is highly susceptible to the addition of other phonemes, leading to the suppression of the morpheme's sound by three consonants at once. This aligns with previous studies that highlight the variability in human speech due to independent causes like speaking style (Johnson, 2004; Livescu et al., 2016).

Table 5

Sample of Phoneme Addition

Correct	Error	Add
[iŋkatanku]	[iŋkatanku]	[k]
[baŋunan]	[baŋkunan]	[k]
[məŋatakan]	[məŋgatakan]	[g]
[kəcil]	[kəncil]	[n]
[kətuwa]	[kətu _w aw]	[w]

Phoneme Omission and Replacement

The majority of phoneme omission and replacement patterns also occur in morphemes that contain more than two syllables and morphemes that contain nasal letters, such as the phoneme /ny/ [ɲ], which is not owned in the Thai script. Then, based on ethnographic notes and emic interviews, in such conditions, it is very prone to make pronunciation mistakes, one of which is by removing the phoneme in a morpheme as well as replacing the existing phoneme with another phoneme so that two mistakes are made at once. This claim is in line with previous research by Rusminto (2022), which argued that BIPA students made several types of errors, such as adding certain elements that should not be necessary or eliminating certain elements that should be needed.

Table 6
Sample of Phoneme Omission and Replacement

Correct	Error	Loss	Replace
[bɯɲi]	[buyu]	[n]	[i] → [u]
[mənəmu _w i]	[məməmu]	[i]	[n] → [m]
[kɔmpulan]	[kepulan]	[m]	[ɔ] → [e]
[məmərɪntah]	[məmərɪtan]	[n]	[h] → [n]

Phoneme Replacement and Addition

The majority of this pattern also occurs in morphemes that contain more than two syllables and morphemes that contain double letters or nasal sounds in them, such as phonemes /ng/ [ŋ] or /ny/ [ɲ], which are difficult for Thai speakers to pronounce especially when the position is placed at the beginning or middle of the morpheme so that unnecessary sound emphasis is made. Speakers' lack of fluency in letters of the alphabet makes it difficult for speakers to read them, especially morphemes with three or more syllables. This pattern claim is also supported by ethnographic notes and emic interviews, which show that the influence of suprasegmental tones or sounds in Thai is powerful because Thai is classified as a phonemic language. Hence, it emphasizes unnecessary sounds such as /nya/ becomes /nnya/.

Table 7
Phoneme Replacement and Addition

Correct	Error	Replace	Add
[tərlalu]	[tərluluh]	[a] → [u]	[h]
[bərlalɯɲa]	[bərlalanɲa]	[u] → [a]	[n]
[pərtɔlɔŋan]	[pərtɔlangan]	[ɔ] → [a]	[g]
[jaguŋ]	[caŋuŋ]	[j] → [ɟ]	[n]
[tərlalu]	[tərluluh]	[a] → [u]	[h]

Out of Place Syllable Cutting

The majority of pronunciation errors occur in morphemes that are difficult to pronounce, such as those with three or more syllables and specific phonemes that are not present in the speaker's mother tongue. The speaker admits to having difficulty pronouncing these types of morphemes,

often making mistakes in segmenting or separating syllables. In addition, the speaker's familiarity with the Thai script causes a stagnation in speech speed, which is correlated with many phonetic variables (Kim & Tilsen, 2022). This results in a decrease in speech speed when encountering words with three or more syllables and difficulties in segmenting or cutting syllables correctly.

Table 8
Sample of Out of Place Syllable Cutting

Word	Error	Correct
[baŋunan]	[baŋun-an]	[ba-ŋu-nan]
[baŋaʔ]	[ban-ŋaʔ]	[ba-ŋaʔ]
[bəbərəpa]	[bəbər-apa]	[bə-bə-ra-pa]
[bərapa]	[bər-apa]	[bə-ra-pa]
[pərtɔlɔŋan]	[pərtɔlɔŋ-an]	[pərt-tɔ-lɔ-ŋan]

Phoneme Errors into Partially and Totally Changed Morphemes

The majority of this pattern also occurs in morphemes that contain more than two syllables or morphemes which contain phonemes that are considered difficult or are mispronounced in the previous data, for example, phonemes [r], [ŋ], and [l], including rare phonemes such as phoneme [c], in which up to nine error variations are found in [kəcil]. Ethnographic notes, as well as emic claims, agree with this. Thai BIPA speakers, who were primarily monolingual and unfamiliar with the alphabet from the start, were prone to making pronunciation mistakes to the point where they changed a morpheme either partially or entirely, making it difficult to identify its meaning.

Table 9
Sample of Phoneme Errors Into Partially and Totally Changed Morphemes

Correct	Error
[bərbagaɲ]	[bərbəlu]
[bərbuɲi]	[dərtan-ji]
[məlihatʔ]	[məlut]
[məŋuniŋ]	[məŋnuŋkis]
[pərəmpu _w an]	[bərɪtʔpu-an]
[sɔŋkɔʔ]	[sagɔh]

Based on all points of discussion, it can be stated that the language acquisition process, cultural influences, and educational environment have substantial impacts on the errors and articulatory phonetic patterns shown by Thai speakers who study BIPA at SWM School. Ages that are no longer in the golden critical age, a monolingual culture, and an educational environment that does not encourage second language learning are among the significant aspects. These findings can certainly influence language teaching strategy and curriculum development because achieving learning outcomes requires adjustments to how the conditions of teaching and learning activities take place, including pronunciation errors confronted by students.

However, it is unfortunate that this study could not cover this area comprehensively, and thus, it can be a recommendation for future research.

CONCLUSION

The study results show that there are a total of 671 errors (184 vowels and 389 consonants), with consonant errors being more common than vowel errors. The most common vowel errors occur in double vowels [u_wa] (32), open front unrounded [a] (27), and near-close near-back rounded [ʊ] (18). Consonant errors frequently occur in apico-alveolar [r] (83), apico-alveolar [l] (35), lamino-palatal [j] (31), and dorso-velar [ŋ] (30). These errors are caused by various factors such as the similarity or proximity of articulators, points of articulation, air passages, movement of vocal cords, and interference from the mother tongue. All patterns based on the theory mentioned previously were found, and several additional patterns were even found based on more varied research data. The patterns formed by these errors include tendencies based on the majority of errors, replacements, omissions, additions, omissions and replacements, replacements and additions, cutting of syllables out of place, and pattern of phoneme errors to change the morpheme partially and totally. Last but not least, future research is suggested to examine the influence of suprasegmental sounds on BIPA or other phonetic language pronunciation because Thai speakers rely on suprasegmental sounds as one of the differentiating elements of meaning which affects their pronunciation when speaking other languages. It is also recommended that a further study can be oriented to utilize the result of this study in BIPA teaching and learning activities, especially for Thai students.

REFERENCES

- Adityarini, I. A. P., Pastika, I. W., & Sedeng, I. N. (2020). Interferensi fonologi pada pembelajar BIPA asal Eropa di Bali. *Aksara*, 32(1), 167-186. <https://aksara.kemdikbud.go.id/index.php/aksara/article/view/409>
- Adnyana, I. A., & Suryaniadi, S. M. (2020). Kajian kesalahan pemelajar BIPA dalam praktik menulis di Politeknik Negeri Bali. *Deiksis: Jurnal Pendidikan Bahasa dan Sastra Indonesia*, 7(1), 27-35. <https://doi.org/10.33603/deiksis.v7i1.2583>
- Agustina, T., & Oktavia, W. (2019). Analisis kesalahan berbahasa pada bahan ajar kelas menyimak program BIPA IAIN Surakarta. *Disastra: Jurnal Pendidikan Bahasa dan Sastra Indonesia*, 1(2), 60-70. <https://ejournal.iainbengkulu.ac.id/index.php/disastra/article/view/1866>
- Akyun, Q. (2020). Pembelajaran Bahasa Indonesia tulis BIPA tingkat pemula. *GHANCARAN: Jurnal Pendidikan Bahasa dan Sastra Indonesia*. <https://doi.org/10.19105/ghancaran.v0i0.3770>
- Ambalegin, A. (2021). Phonological Analysis of English Vowel Pronunciation. *KnE Social Sciences*, 5(4), 28-45. <https://doi.org/10.18502/kss.v5i4.8665>
- Andriyana, A., Anh, H. H. V., & Iswatiningsih, D. (2022). Kesalahan fonologi mahasiswa Vietnam tingkat BIPA 1 dalam pelafalan fonem Bahasa Indonesia. *Jurnal Bahasa Indonesia Bagi Penutur Asing (JBIPA)*, 4(2), 119-124. <http://ojs.badanbahasa.kemdikbud.go.id/jurnal/index.php/bipa/article/view/4589>
- Asdar. (2018). *Metode penelitian pendidikan: Suatu pendekatan praktik*. Pustaka AQ.
- Best, C., & Strange, W. (1992). Effects of phonological and phonetic factors on crosslanguage perception of approximants. *Journal of Phonetics*, 20(3), 305-330. [https://doi.org/10.1016/S0095-4470\(19\)30637-0](https://doi.org/10.1016/S0095-4470(19)30637-0)
- Browman, C. P., & Goldstein, L. M. (1986). Towards an articulatory phonology. *Phonology*, 3(-), 219-252. <https://doi.org/10.1017/S0952675700000658>
- Browman, C. P., & Goldstein, L. (1989). Articulatory gestures as phonological units. *Phonology*, 6(2), 201-251. <https://www.jstor.org/stable/4419998>
- Byrd, D., & Saltzman, E. (2003). The elastic phrase: Modeling the dynamics of boundary-adjacent lengthening. *Journal of Phonetics*, 31(2), 149-180. [https://doi.org/10.1016/S0095-4470\(02\)00085-2](https://doi.org/10.1016/S0095-4470(02)00085-2)
- Chen, J., Antoniou, M., & Best, C. T. (2023). Phonological and phonetic contributions to perception of non-native lexical tones by tone language listeners: Effects of memory load and stimulus variability. *Journal of Phonetics*, 96(-), 101199. <https://doi.org/10.1016/j.wocn.2022.101199>
- Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative qualitative research (4th ed.)*. Pearson Education Inc.
- Darma, A. A. N. A., Fasisaka, I., & Resen, P. T. K. (2018). Penggunaan Bahasa Indonesia sebagai media diplomasi antara Indonesia dengan Thailand melalui program pengajaran Bahasa Indonesia untuk Penutur Asing (BIPA) pada tahun 2011-2015. *DIKSHI (Diskusi Ilmiah Komunitas Hubungan Internasional)*, 1(1), 1-10. <https://ojs.unud.ac.id/index.php/hi/article/view/38359>

- Fadly, A. (2022). Interferensi fonologis Bahasa Somali ke dalam Bahasa Indonesia dan implikasinya bagi pembelajaran BIPA. *Pena Literasi, 5*(1), 1-8.
<https://jurnal.umj.ac.id/index.php/penaliterasi/article/view/12434>
- Fatahillah, A. (2020). Pengembangan bahan ajar BIPA tingkat pemula (beginner) di Songserm Wittaya Mulnithi Kuthao Hadyai Thailand. *Jurnal Penelitian, Pendidikan, dan Pembelajaran, 15*(32), 1-14.
<https://jim.unisma.ac.id/index.php/jp3/article/view/8060/6615>
- Fowler, C. A., Rubin, P., Remez, R. E., & Turvey, M. T. (1980). Implications for speech production of a general theory of action. *Language production, 1*(-), 373-420.
<https://haskinslabs.org/sites/default/files/files/Reprints/HL0295.pdf>
- Hallé, P. A., Best, C., & Levitt, A. (1999). Phonetic vs. phonological influences on French listeners' perception of American English Approximants. *Journal of Phonetics, 27*(3), 281-306.
<https://doi.org/10.1006/jpho.1999.0097>
- Herniti, E. (2017). Kesalahan berbahasa Indonesia tulis pada mahasiswa Thailand (Studi atas pembelajar BIPA di PPB UIN Sunan Kalijaga). *Thaqafiyat: Jurnal Bahasa, Peradaban dan Informasi Islam, 18*(1).
<https://ejournal.uin-suka.ac.id/adab/thaqafiyat/article/view/1306>
- Hertiki. (2020). Kesalahan berbahasa dalam keterampilan menulis pemelajar BIPA di Universitas Maejo, Chiang Mai, Thailand. *Multilingual, 19*(1).
<https://doi.org/10.26499/multilingual.v19i1.133>
- Huffman, M. K. (2016). Articulatory phonetics. In *Oxford Research Encyclopedia of Linguistics*.
<https://doi.org/10.1093/acrefore/9780199384655.013.55>
- Iskarous, K., & Pouplier, M. (2022). Advancements of phonetics in the 21st century: A critical appraisal of time and space in articulatory phonology. *Journal of Phonetics, 95*(-), 101195.
<https://doi.org/10.1016/j.wocn.2022.101195>
- Jannah, A. N., & Khaerunnisa, K. (2022). Analisis kesalahan berbahasa (tulis) pemelajar BIPA level 7 dalam pembuatan karya ilmiah. *Mardibasa: Jurnal Pembelajaran Bahasa dan Sastra Indonesia, 2*(2), 134-142.
<https://doi.org/10.21274/jpbsi.2022.2.2.134-142>
- Jati, E. R. D. (2016). *Program pembelajaran Bahasa Indonesia bagi penutur asing di Photharam Technical College, Thailand*. BIPA Kemdikbud.
https://bipa.kemdikbud.go.id/filebakti/701Elizabeth_Ratri_-_Program_Pembelajaran_Bahasa_Indonesia_bagi_Penutur_Asing_di_Photharam_Technical_College,_Thailand.pdf
- Jazeri, M. (2013). Analisis kesalahan berbahasa tulis pebelajar Bahasa Indonesia untuk Penutur Asing (BIPA) di Sanggar Kampung Indonesia Tulungagung. *Jurnal Lingua Scientia, 5*(1), 1-10.
<https://doi.org/10.21274/ls.2013.5.1.1-10>
- Ji, Y., Wei, J., Zhang, J., Fang, Q., Lu, W., Honda, K., & Lu, X. (2017). Speech behavior analysis by articulatory observations. *Procedia Computer Science, 111*(-), 463-470.
<https://doi.org/10.1016/j.procs.2017.06.048>
- Johnson, K. (2004). Massive reduction in conversational American English. In *Spontaneous Speech: Data and Analysis, Proceedings of the 1st Session of the 10th International Symposium* (pp. 29-54).
<https://api.semanticscholar.org/CorpusID:16949480>
- Jovita, A., Tanti A., & David S. (2020). Analisis kesalahan berbahasa dalam keterampilan menulis mahasiswa Thailand di Program BIPA Universitas Muhammadiyah Sukabumi. *Utile: Jurnal Kependidikan, 5*(2), 188-196.
<https://doi.org/10.37150/jut.v5i2.634>
- Karlina, Y., Rahman, A., & Chowdhury, R. (2020). Designing phonetic alphabet for Bahasa Indonesia (PABI) for the teaching of intelligible English pronunciation in Indonesia. *Indonesian Journal of Applied Linguistics, 9*(3), 724-732.
<https://doi.org/10.17509/ijal.v9i3.23223>
- Kementerian Pendidikan dan Kebudayaan. (2017). *Salinan Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 27 Tahun 2017*. Kementerian Pendidikan dan Kebudayaan RI.
- Kim, S. E., & Tilsen, S. (2022). An investigation of functional relations between speech rate and phonetic variables. *Journal of Phonetics, 93*(-), 101152.
<https://doi.org/10.1016/j.wocn.2022.101152>
- Kusuma, E. R., & Kayati, A. N. (2023). Pola kesalahan berbahasa pada pembelajaran BIPA program darmasiswa. *Jurnal Pendidikan Bahasa dan Sastra Indonesia Metalingua, 8*(1), 18-23.
<https://journal.trunojoyo.ac.id/metalingua/article/view/19210>
- Lafamane, F. (2020). Fonologi (sejarah, fonetik, fonemik). *Gramatika: Jurnal Ilmiah Kebahasaan dan Kesastraan, 6*(2), 1-17.
<https://doi.org/10.31219/osf.io/snmfh>
- Lathifah, N. R., Anggita, F. D., & Rosianingsih, S. (2021). Analisis kesalahan berbahasa dalam tataran fonologi pada kanal YouTube "MAS BAS-BULE PRANCIS". *Lingua Rima: Jurnal*

- Pendidikan Bahasa dan Sastra Indonesia* 10(1), 91-98.
<https://jurnal.umt.ac.id/index.php/lgrm/article/view/4094>
- Lenaini, I. (2021). Teknik pengambilan sampel purposive dan snowball sampling. *Jurnal HISTORIS*, 6(1), 33-39.
<https://doi.org/10.31764/historis.v6i1.4075>
- Lindayani, L. R. (2020). Studi geografi imajinatif dalam proses pembelajaran BIPA (Pengenalan metode formasi strategis dan posisi strategis). *Jurnal Pendidikan Bahasa dan Sastra Indonesia*, 9(1), 26-31.
<https://doi.org/10.15294/jpbsi.v9i1.38557>
- Livescu, K., Jyothi, P., & Fosler-Lussier, E. (2016). Articulatory feature-based pronunciation modeling. *Computer Speech & Language*, 36, 212-232.
<https://doi.org/10.1016/j.csl.2015.07.003>
- Lu, L., Wong, I. A., & Zhang, Y. (2021). Second language acquisition and socialization in international trips. *Journal of Hospitality and Tourism Management*, 47(-), 1-11.
<https://doi.org/10.1016/j.jhtm.2021.02.007>
- Maharani, D., Septianingsih, N. A., & Putri, R. S. (2021). Analisis kesalahan berbahasa tataran fonologi pada grup band Korea Selatan Super Junior. *Kode: Jurnal Bahasa*, 10(2), 160-169.
<https://jurnal.unimed.ac.id/2012/index.php/kjb/article/view/26599>
- Maulida, S. Z., Nurjanah, A. P., dan Yustika (2019). Kesalahan melafalkan kosa kata Bahasa Indonesia oleh mahasiswa Thailand di IAIN Tulungagung. In *Konferensi Nasional Bahasa dan Sastra (Konnas Basastra) V*, 5(1), pp.246-250.
<https://jurnal.fkip.uns.ac.id/index.php/knbs/article/view/12900>
- Mekarisce, A. A. (2020). Teknik pemeriksaan keabsahan data pada penelitian kualitatif di bidang kesehatan masyarakat. *Jurnal Ilmiah Kesehatan Masyarakat*, 12(3), 145-151.
<https://doi.org/10.52022/jikm.v12i3.102>
- Miles, M. B., & Huberman, A. M. (2014). *Analisis data kualitatif: Buku sumber tentang metode-metode baru (Universitas Indonesia, penerjemah)*. Universitas Indonesia Press.
- Mücke, D., Hermes, A., & Tilsen, S. (2020). Incongruencies between phonological theory and phonetic measurement. *Phonology*, 37(1), 133-170.
<https://doi.org/10.1017/s0952675720000068>
- Muslich, M. (2018). *Fonologi Bahasa Indonesia: Tinjauan deskriptif sistem bunyi Bahasa Indonesia*. PT Bumi Aksara.
- Nasution, J. (2019). Analisis kesulitan Bahasa Indonesia bagi pemelajar di SamSifl Uzbekistan pada empat keterampilan berbahasa. *Medan Makna: Jurnal Ilmu Kebahasaan dan Sesastraan*, 17(2), 111-120.
<https://doi.org/10.26499/mm.v17i2.2134>
- Naufalia, A., Sitaresmi, N., dan Rahma, R. (2021). Kesalahan fonetik artikulatoris pada pelafalan pengajar BIPA Korea sebagai bahan ajar BIPA. *Jurnal Artikulasi*, 1(2), 103-110.
<http://repository.upi.edu/62623/>
- Pariyanto, Sudarwati, & Khasanah, U. (2019). Kesalahan bahasa tulis kalimat Bahasa Indonesia oleh pemelajar BIPA di Thailand Selatan. *Parafrase: Jurnal Kajian Kebahasaan dan Kesastraan*, 19(1), 39-46.
<https://doi.org/10.30996/parafrase.v19i1.2373>
- Prihatiningtyas, A. D., & Mardikarno, S. P. (2015). Pengaruh sistem fonologi bahasa pertama terhadap pembelajaran bahasa kedua: Studi kasus pada penutur Bahasa Jepang. In *Prosiding Seminar Hasil Penelitian. Lembaga Penelitian, Pemberdayaan Masyarakat dan Kemitraaan Universitas Darma Persada*.
<http://eprints.undip.ac.id/55320/>
- Rosalina, S., & Maspuroh, U. (2023). Analisis kesalahan penggunaan bahasa tulis mahasiswa pada program BIPA Universitas Singaperbangsa Karawang. *Jurnal Pendidikan dan Konseling (JPDK)*, 5(2), 2751-2759.
<https://doi.org/10.31004/jpdk.v5i2.13722>
- Rusminto, N. E. (2022). Kesalahan pembentukan kata Bahasa Indonesia tulis mahasiswa BIPA. *Aksara: Jurnal Bahasa dan Sastra*, 23(1), 148-169.
<http://jurnal.fkip.unila.ac.id/index.php/aksara/article/view/22713>
- Sa'diyah, I., & Izhatullaili, I. (2017). Pedoman pelafalan baku bahasa Indonesia dengan media audiovisual dalam pembelajaran bahasa Indonesia sebagai bahasa kedua atau bahasa asing. In *Proceedings Education and Language International Conference*, 1(1), 417-425.
<http://jurnal.unissula.ac.id/index.php/ELIC/article/view/1255>
- Salamah & Setiawati, E. (2023). Introduksi dan penguatan BIPA melalui skema MBKM sebagai upaya penguatan diplomasi dan kepemimpinan bangsa: Studi Songserm Wittaya Mulniti Thailand. In *Seminar Nasional Literasi Prodi PBSI FPBS UPGRIS* (pp. 563-577).
<https://conference.upgris.ac.id/index.php/snl/article/view/4900>
- Saltzman, E. L., & Munhall, K. G. (1989). A dynamical approach to gestural patterning in speech production. *Ecological Psychology*, 1(4), 333-382.
<https://doi.org/10.1207/s15326969eco01042>
- Setiawaty, R., Sabardila, A., & Wahyudi, A. B. (2019). Bentuk-bentuk kebahasaan melayu pattani dalam praktik pidato BIPA dan implementasinya sebagai bahan ajar. *Pena:*

- Jurnal Pendidikan Bahasa dan Sastra*, 9(1), 99-115. <http://online-journal.unja.ac.id/pena/article/view/6865>
- Siagian, E. N. (2017). Analisis kesalahan berbahasa (tulisan) mahasiswa BIPA tingkat lanjut universitas Yale, USA. In *FKIP e-Proceeding* (pp. 11-22). <https://jurnal.unej.ac.id/index.php/fkip-epro/article/view/4849>
- Sitepu, T., & Rita, M. P. (2017). Bahasa Indonesia sebagai media primer komunikasi pembelajaran. *Bahastra: Jurnal Pendidikan Bahasa dan Sastra Indonesia*, 2(1), 67-73. <https://doi.org/10.30743/bahastra.v2i1.748>
- Sudaryanto. (2015). *Metode dan aneka teknik analisis bahasa: Pengantar penelitian wahana kebudayaan secara linguistis*. Universitas Sanata Dharma.
- Tawandorloh, K. A., Islahuddin, I., & Nugraheny, D. C. (2021). Program Bahasa Indonesia bagi Penutur Asing (BIPA) di Universitas Fatoni, Thailand. *Indonesian Language Education and Literature*, 7(1), 139-151. <http://doi.org/10.24235/ileal.v7i1.8603>
- Tiawati, R. L. (2015). Bahasa Indonesia di Thailand menjadi media diplomasi kebahasaan dan budaya di ASEAN melalui pengajaran BIPA. *Jurnal Gramatika: Jurnal Penelitian Pendidikan Bahasa dan Sastra Indonesia*, 1(1), 29-44. <https://doi.org/10.22202/jg.2015.v1i1.1159>
- Tilsen, S. (2019). Motoric mechanisms for the emergence of non-local phonological patterns. *Frontiers in Psychology*, 10(-), 2143. <https://doi.org/10.1080/10407413.2016.1230368>
- Wijayanti, Y., & Siroj, M. B. (2020). Analisis kesalahan bahasa tulis Pemelajar Bahasa Indonesia bagi Penutur Asing (BIPA) level 2b wisma Bahasa Yogyakarta. *Jurnal Sastra Indonesia*, 9(2), 90-96. <https://doi.org/10.15294/jsi.v9i2.31568>
- Xiaonong, Z., & Wright, J. D. (Ed.). (2015). Phonetics, articulatory. *International Encyclopedia of the Social & Behavioral Sciences*, 18(-), 65-74. <https://doi.org/10.1016/B978-0-08-097086-8.52013-3>
- Zed, M. (2018). *Metode penelitian kepustakaan*. Yayasan Obor.
- Zen, E. L. (2020). Role of regional language background and speech styles on the production of Voice Onset Time (VOT) in English among Indonesian multilinguals. *Indonesian Journal of Applied Linguistics*, 10(2), 359-368. <https://doi.org/10.17509/ijal.v10i2.28604>