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L1 INTERFERENCE AND PRONUNCIATION DIFFICULTIES AMONG PRE-SERVICE EFL TEACHERS IN INDONESIA

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Abstract
Pronunciation plays a critical role in English as a Foreign Language (EFL) learning, as it directly influences learners' communication fluency and comprehensibility. However, in the Indonesian EFL context, many pre-service English teacher students continue to experience pronunciation difficulties, which are commonly influenced by their first language (L1), limited early exposure to English, and the complexity of English phonology. This study aimed to investigate the types of pronunciation difficulties faced by pre-service English teacher students, the influence of L1 interference on their English pronunciation, and the strategies they employ to overcome these challenges. This research combined qualitative thematic analysis and acoustic phonetic analysis, involved four pre-service English teacher students from diverse regional language backgrounds, Sundanese, Javanese, Buginese, and Ambonese Malay. Data were collected through semi-structured interviews conducted online via Zoom, and vowel formant analysis was conducted using PRAAT software to compare the participants' vowel production with native speaker benchmarks. The data analyzed using thematic analysis framework revealed five central themes: (1) perceived pronunciation difficulties and language awareness, (2) challenges with English phonemes absent in L1, (3) the influence of L1 stress, rhythm, and intonation, (4) pronunciation learning strategies including classroom practices, and (5) motivation linked to professional identity. Additionally, motivation emerged as a significant factor in improving pronunciation. The PRAAT analysis confirmed that the participants' L1 backgrounds strongly influenced variations in vowel production. It concludes that L1 interference significantly shapes pronunciation difficulties, while self-awareness, motivation, and active learning strategies play essential roles in mitigating these challenges.

Keywords: Indonesian EFL context, interlanguage theory, L1 interference, pre-service English teacher students, pronunciation difficulties

Introduction

Pronunciation plays a central role in acquiring English as a Foreign Language (EFL) because it directly influences learners' oral fluency and communicative clarity. Clear pronunciation allows speakers to be understood and to understand others effectively, minimizing communication breakdowns and increasing self-confidence in speaking (Gilakjani, 2012; Khan, 2020). However, many EFL learners continue to face persistent pronunciation difficulties. Mispronunciation can lead to confusion, misinterpretation, and reduced communicative competence (Takidze, 2024), making it a crucial area of study.

In the Indonesian EFL context, especially among pre-service English teacher students—those who are preparing to become future educators—pronunciation challenges are particularly important. These students are expected not only to acquire accurate pronunciation themselves but also to model it effectively for their future students (Çam, 2023).

Indonesia's linguistic diversity contributes to this challenge. For example, students from Sundanese, Javanese, Buginese, and Ambonese Malay backgrounds, for instance, bring different phonological systems into their English learning process (Jihad et al., 2020). Examples include sound substitutions such as /f/ to /p/ in Sundanese, epenthesis (adding vowels at word-final consonants) in Javanese, and the replacement of interdental sounds /θ/ and /ð/ with dental or plosive sounds in Buginese (Astuty, 2022; Nurpahmi, 2013). As the comparison from the case in Minangkabau, the limited presence of certain consonants like /z/ and shifts in vowel quality also create pronunciation difficulties (Suksio & Jufrizal, 2024; Wahyudi et al., 2024). These L1 phonological influences result in both positive transfer where similarities aid learning, and negative transfer, which leads to persistent pronunciation errors (Listyani et al., 2024; Ning, 2024).

Despite its importance, pronunciation instruction often remains marginalized in EFL programs, with greater emphasis placed on grammar and vocabulary. Nguyen et al. (2021) emphasize that these challenges become worse by the insufficient classroom resources for pronunciation practice and the limited access to native-speaking models. Balla and Elmahdi (2024) also highlight the fact that pronunciation is frequently deprioritized, which results in learners being unable to address persistent errors caused by L1 interference. In addition, teachers often report insufficient training in pronunciation teaching, and classroom resources are often limited. Additionally, pronunciation is frequently assessed informally or neglected (Çam, 2023).

A growing body of research has investigated pronunciation in EFL situations from several viewpoints. Several research examine overarching elements influencing pronunciation development, including learner motivation, exposure, and pedagogical techniques (Nguyen et al., 2021; Almusharraf, 2024; Fadillah, 2020). Other research has explicitly examined L1 interference and its effect on pronunciation accuracy, especially with segmental features. In recent years, some studies have started to integrate acoustic analysis, using methods like PRAAT to provide more objective assessments of learners' speech output. However, these research frameworks remain mostly fragmented. Few researches have also investigated (1) the experiences of pre-service English teacher students, (2) the influence of L1 interference on both segmental and suprasegmental features and (3) the integration of perceptual data with acoustic phonetic analysis. Research concentrating on pre-service teachers is limited, despite their important role as future pronunciation benchmarks in EFL education.

This study employs Selinker's (1972) Interlanguage Theory as its theoretical framework to address this gap. The theory claims that EFL learners create a distinct language system shaped by their L1 and the target language (L2), potentially resulting in fossilized errors if unaddressed. This study utilizes a mixed-methods approach, integrating thematic analysis of learners' experiences with vowel formant analysis using PRAAT software, thereby merging qualitative and acoustic phonetic perspectives to enhance understanding of pronunciation challenges.

This study is guided by the subsequent research questions:

1. What types of pronunciation difficulties are experienced by pre-service English teacher students?
2. How does L1 interference influence their English pronunciation?
3. What strategies do they employ to overcome these pronunciation difficulties?

This study's findings aim to enhance comprehension of pronunciation difficulties in the Indonesian EFL context, especially among prospective teachers, and to guide the development of more effective pedagogical strategies for overcoming L1-related pronunciation challenges.

Literature Review

The impact of L1 on learning English

Selinker's (1972) Interlanguage Theory offers a comprehensive framework for understanding how L1 influences the acquisition of L2. The theory suggests that learners develop an interlanguage, a transitional linguistic system that combines elements of their native language and the target language. A central concept in the theory is L1 interference, where phonological, grammatical, or lexical rules from L1 are transferred into L2. Interlanguage is also viewed as a complex, nonlinear system influenced by individual creativity and social adaptation (Tarone, 2024). It incorporates features from both L1 and L2, resulting in distinct grammatical and lexical structures (Wei, 2023).

In pronunciation, this interference often results in consistent errors when learners apply the phonological rules of L1 to English sounds. Phonological rules from L1 can lead to mispronunciations in L2, as seen in Pakistani ESL learners who struggle with English sounds due to native phonetic systems (Rasheed, 2024). Japanese learners also exhibit over-passivization errors in English, which are influenced by their L1's morphological structures (Tazaki, 2023).

Selinker (1972) also highlights the phenomenon of fossilization, where repeated reliance on L1 features can cause incorrect forms to become ingrained, even after exposure to L2 instruction. Interlanguage fossilization occurs when students reach a plateau, preventing further linguistic progress (Dai, 2023; Geng, 2024). According to Guo (2022), this phenomenon appears due to several factors including negative language transfer, ineffective teaching methods, and overgeneralization of L2 rules. For example, an Indonesian learner might consistently mispronounce English diphthongs or consonant clusters due to differences in phonological structures between the two languages. Fossilization underscores the persistent impact of L1 on L2 learning, particularly in contexts with limited exposure to native L2 pronunciation models (Selinker, 1972).

There are some causes of fossilization. In psychological factors, learners may unconsciously apply L1 rules to L2, resulting in persistent errors (Ahibalova, 2019). Limited interaction in L2 contexts can also reinforce fossilized forms (Wang, 2023). Furthermore, Wang (2023) added that students who are overwhelmed may revert to familiar L1 structures when under pressure.

Pronunciation difficulties

Pronunciation difficulties among English as a Foreign Language (EFL) students in Indonesia refer to the challenges faced by individuals attempting to accurately pronounce English words (Derwing & Rossiter, 2002; Fadillah, 2020). These difficulties included shifts in vowels and consonants, mother tongue influence, limited exposure to the target language, and biological factors.

Moreover, EFL students frequently encounter several difficulties in achieving clear English pronunciation, which can be attributed to various factors including the influence of their native

language, lack of exposure to authentic English sounds, and limited practice opportunities. These challenges often manifest in specific pronunciation issues, such as difficulties with English phonemes not present in the student's native language or problems with stress and intonation patterns (Nguyen et al., 2021). Pronunciation difficulties as one of the key challenges for EFL learners, and addressing these challenges is crucial for both learners' confidence and communicative competence.

Moreover, Tambunsaribu and Simatupang (2021) identified several reasons why certain L2 learners encounter challenges pertaining to L2 pronunciation difficulties, including: the relationship between spelling and phonetics may exist in a student's native language, an L2 student learning English may initially rely on English sounds linked to the new sound-spelling correspondences, certain phonemes of their native language may be absent in English, their native language may lack certain English phonemes, and the stress and intonation patterns in English may be perplexing for learners of the language.

EFL students' pronunciation learning strategies

Pronunciation is a crucial element of EFL learners' communicative skills, since it directly influences intelligibility, confidence, and perceived proficiency. Research indicates that enhanced pronunciation improves understanding, diminishes miscommunication, and elevates learners' enthusiasm and readiness to engage in speaking (Pawlak & Szyszka, 2018; Abdalla et al., 2020). This underscores the need of methodical pronunciation enhancement in EFL settings.

Pronunciation learning strategies (PLSs) denote the methods and intentional efforts used by learners to enhance their pronunciation. These tactics facilitate self-directed and active learning, allowing learners to cultivate both segmental and suprasegmental elements of speech. The use of effective strategies is associated with enhanced learning efficiency, heightened confidence, and superior communication performance (Rokoszewska, 2012; Szyszka, 2015).

Prior studies have recognized many frequently used PLSs, including self-monitoring, imitation, repetition, and the utilization of pronunciation resources like as dictionaries and audio models (Osburne, 2003; Szyszka, 2021). The use of strategies may differ based on learner competence and task requirements, with more successful learners often adopting a broader and more adaptable array of techniques. Instruction centered on strategy has shown the capacity to improve learner autonomy, motivation, and self-efficacy, especially when learners participate in consistent and targeted pronunciation practice (Kirkova-Naskova, 2023).

Pronunciation challenges and strategy utilization may be comprehended via Selinker's Interlanguage Theory (1972), which asserts that learners cultivate a dynamic linguistic system shaped by both their first and second languages. L1 interference may result in enduring pronunciation problems and fossilization, particularly when exposure to the target language is restricted. In this context, pronunciation learning techniques are essential for assisting learners in overcoming L1-related difficulties and enhancing their interlanguage for improved accuracy and intelligibility.

Methodology

Research design and approach of the study

This study employed a mixed-methods approach within a case study framework, combining qualitative and acoustic phonetic analysis to deliver a comprehensive and contextually informed understanding of the phenomenon (Yin, 2018; Nassaji, 2015). The qualitative component examined the pronunciation difficulties faced by pre-service English teacher students, the impact of their first language (L1) on English pronunciation, and the strategies employed to navigate these obstacles. This was accomplished via thematic analysis of interview data in accordance with Braun and Clarke (2006).

In addition to the qualitative findings, the study utilized acoustic phonetic analysis via PRAAT software to assess participants' vowel production and compare it with native speaker standards. The combination of qualitative insights and instrumental analysis provided a more thorough comprehension of the representation of L1 interference in both perceived challenges and measurable phonetic variation.

Research site and participants

The subjects of this research are future English educators participating in the Teacher Professional Education (*PPG*) program under the English Education curriculum at public colleges. This study aimed to investigate the types of pronunciation difficulties faced by pre-service English teacher students, the influence of L1 interference on their English pronunciation, and the strategies they employ to overcome these challenges.

Inclusion criteria for participants were chosen according to certain criteria. The first, they have registered or have just finished the *PPG* program in the English Education curriculum. Second, their positions are as an aspiring English educator. Third, they possess a distinct regional linguistic background (L1) to facilitate the examination of L1 impact on English language acquisition and instruction. The selection of these four examples is intentional to guarantee comprehensive study while also attaining cross-regional representation. They represent distinct provinces/regions in Indonesia: West Java, Central Java, South Sulawesi, and Maluku. Each participant originates from a region with a distinct native language (L1): Sundanese (West Java), Javanese (Central Java), Bugis (South Sulawesi), and Ambonese Malay (Maluku). Fourth, they have prepared to provide written permission (informed consent) and engage in comprehensive interviews. Fifth, they are available to arrange interviews (either in-person or remote) throughout the data collecting timeframe. At the end, they focus on numerical and spatial mapping consistency.

This study is as exploratory qualitative study by semi-structured interviews and reflective papers as triangulation. For instances, the researchers have done extensive interviews, precise verbatim transcriptions, and comprehensive theme analysis. A limited sample size facilitates researchers in upholding ethical standards (e.g., informed permission, confidentiality), permits member-checking, and guarantees thorough analysis without jeopardizing internal validity, and recruitment and access procedure participants were intentionally recruited via institutional connections with the *PPG* program at state colleges. These recruiting processes reach out to the *PPG* coordinators at each institution to get a list of applicants or graduates who fulfill the requirements. The researches contacted participants via the institution's email or phone to elucidate the research's objective, processes, and ethical safeguards, and obtain formal informed consent and confirm the participants' rights, including confidentiality, data anonymization, and the ability to withdraw at any time.

The researchers also employ member-checking to augment the trustworthiness of the results. Each participant is provided with a written and verbal elucidation of the study goals, interview protocols, possible advantages and hazards, along with promises of anonymity.

Data collection

Data were collected through semi-structured interviews conducted online via Zoom to accommodate the participants' geographical locations. These interviews explored participants' pronunciation awareness, specific segmental and suprasegmental errors, L1 influence, and their learning strategies, based on Selinker's Interlanguage Theory (Selinker, 1972).

Audio recordings were conducted via Zoom meetings with the research participants to collect data during the interview sessions. The sound features used as a reference for observation are several forms of English sounds such as /θ/, /ð/, /f/, /v/, /ʃ/, /z/, /dʒ/ from the words think, this, for, very, she, zebra, and junior.

The interview data has been transcribed, and the transcription results are validated with the participants for member checking. Effective communication with participants is achieved by contacting them and subsequently inviting all participants to a WhatsApp group prior to the data collection interview, facilitating more active interaction with the researcher, who conveys essential information regarding technical or content-related aspects of data collection. Participants were also inquired about their voluntary willingness to engage in the interview. The researcher allowed participants to indicate any data from the interview that they wished to exclude or had consented to include in the analysis.

PRAAT software was used to do an acoustic phonetic analysis in order to complement the qualitative results. The first (F1) and second (F2) formants, which are often employed to indicate vowel height and frontness, were the focus of the investigation, which examined participants' vowel production using formant frequency measures. To separate the target vowel sounds from the chosen words, the recorded speech data was first manually segmented. To ensure measurement stability, each vowel segment was next examined in PRAAT by creating a spectrogram and extracting formant values (F1 and F2) at the vowel's midpoint. To increase the accuracy of formant tracking, default PRAAT parameters were modified as needed. All recordings were examined in a quiet environment to guarantee consistency, and audio components that were unclear or of poor quality were not included in the study. Each participant's extracted formant values were added up and compared.

The vowel formant values of the participants were benchmarked against native speaker reference values from another research (Azzahra et al., 2024; Gde & Madriyanthi, 2018; Narhan et al., 2023; Sultana, 2023; Syarfina & Siregar, 2024). These reference values provide a foundation for spotting variations in vowel production that could be caused by L1 interference. Through methodological triangulation, the research was able to establish a connection between participants' declared pronunciation challenges and quantifiable phonetic variance.

Data analysis

All participants were informed of the study's purpose and ethical considerations and provided written consent. Thematic analysis, as outlined by Braun and Clarke (2006), was used to analyze the qualitative data.

The first step of familiarizing the data the researchers familiarized the data by repeatedly listening to the recorded interview audios from four participants of different L1 backgrounds (Sundanese, Javanese, Bugis, and Ambonese Malay). The audio recordings were then carefully transcribed into written form. In the second step of generating initial codes the researcher began organizing the data by identifying and marking specific segments of the participants' interview transcripts that were relevant to the research objectives. This process generated a collection of initial codes, capturing important points raised in the interviews. The third step, the researcher grouped related codes into broader potential themes. Similar codes, such as difficulties distinguishing English phonemes and replacing them with native equivalents, were clustered together under potential themes. In the fourth step, the researcher reviewed all potential themes to ensure they accurately reflected the coded data and the overall research aim. Any overlapping or unclear themes were refined. The final themes were agreed upon based on their clarity and relevance to the research questions. In the fifth step, the researcher clearly defined what each theme represented and gave each one an appropriate, concise name. The final step, the researcher organized the results based on the finalized themes. The findings were presented and discussed in Chapter IV, supported by direct quotes from the participants, related literature, and acoustic evidence through PRAAT formant analysis, reinforcing the role of L1 interference in shaping pronunciation difficulties.

Findings

The present study aimed to investigate the impact of L1 interference on the pronunciation of pre-service English teacher students in Indonesia. The findings reveal that pronunciation difficulties among participants are multi-layered, involving both segmental and suprasegmental features, and are strongly influenced by their regional first languages (L1s). Five key themes emerged from the analysis: (1) perceived pronunciation difficulties and language awareness, (2) difficulties with English phonemes absent in L1, (3) influence of L1 stress, rhythm, and intonation, (4) pronunciation learning strategies and classroom practice, and (5) motivation linked to professional identity. These were further substantiated by acoustic evidence from PRAAT analysis, which demonstrated measurable deviations in vowel production.

Perceived Pronunciation Difficulties and Language Awareness

Participants consistently reported pronunciation as a major challenge in their English learning process. Unlike vocabulary or grammar, pronunciation errors were described as more "visible" in communication, immediately exposing learners' non-native status and often leading to breakdowns in understanding. Several participants admitted feeling self-conscious about their accents, expressing those mispronunciations sometimes led to embarrassment in classroom presentations or when interacting with peers.

> 'When I first started learning English as a native speaker of Bugis, I had some trouble, especially distinguishing between the pronunciations of 'three' and 'tree.'" – Bugis speaker (F)

The participant indicated that, as a Bugis speaker, they encountered difficulties in differentiating the pronunciations of "three" and "tree." This challenge likely stems from the absence of the /θ/

sound in Bugis, complicating the distinction from /t/. This underscores the impact of L1 phonetics on English pronunciation, resulting in challenges in accurately producing specific sounds.

> *"*In my opinion, pronunciation is one of the biggest challenges in learning English, and I personally struggled with it when I tried to pronounce words beginning with the sounds /θ/
> and /ð/. Those sounds are difficult and take a long time to master.*"* – Sundanese speaker (B)

Not only that, the Sundanese participant also indicated that pronunciation poses a significant challenge in learning English, especially with words commencing with the /θ/ and /ð/ phonemes. They perceive these sounds as challenging and necessitate additional time to articulate them accurately. This underscores the impact of L1 phonetics, as these sounds may be absent in their native language, resulting in pronunciation challenges.

> *"*In my personal opinion, what makes English difficult for me as a Javanese person is that my accent sounds like a regional dialect, whereas I think English is an elegant language, but the pronunciation of each word is very difficult because words are written and pronounced differently. Take the word "tired," for example—I find that one difficult.*"*– Javanese speaker (A)

Meanwhile, the participant indicated that their Javanese accent affects their English pronunciation, rendering it akin to a regional dialect rather than standard English. Individuals encounter difficulties with English due to the frequent discrepancies between its pronunciation and written representation, rendering specific words, such as "tired," especially challenging to articulate. This illustrates the influence of L1 accent and phonological variations on EFL learners' pronunciation.

Difficulties with English phonemes not present in L1

The challenge in articulating sounds in English is caused by the difference in the idea of phoneme between English and the native language, sometimes referred to as the mother tongue. Interview findings indicate that several individuals had challenges with English phonemes that uncommon in their home languages, resulting in persistent pronunciation issues. The lack of specific English phonemes in their first language led participants to depend on recognizable sounds from their home language, often resulting in consistent mispronunciations. The investigation indicates that the pronunciation of English by speakers of several Indonesian languages is markedly affected by their original languages (L1). Participants noted that certain English phonemes, including /θ/, /ð/, /f/, /v/, /ʃ/, and /z/, are lacking in their home languages, resulting in systematic replacements. An Ambonese Malay speaker had difficulties with the /f/ phoneme, often replacing it with /p/, leading to the pronunciation of "for" as "por." This is a common problem, since differentiating comparable sounds is intrinsically difficult for people whose first language lacks certain phonetic features.

A Bugis speaker said that, while they articulate English consonants distinctly, the /r/ sound is markedly different; it is rolled in Bugis, whereas it is softer in English. This unique

phonetic trait results in variants of words such as "water." A Javanese speaker also substituted /θ/ with /t/, demonstrating this phonetic effect by pronouncing "think" as "tink." Moreover, Javanese speakers often change starting phonemes in words, as seen by the pronunciation of "junior" as "yunior," and are affected by the Javanese *medhok* accent, which introduces a /h/ sound, transforming "cook" into "khuk."

Sundanese speakers indicated that the absence of certain phonemes in their native language leads to similar replacements, so supporting the patterns of substituting /θ/ with /t/, /ð/ with /d/, /f/ with /p/, and /z/ with /j/. This phenomenon of phonemic substitution demonstrates the significant influence of L1 phonology on the precision of L2 pronunciation. The findings highlight that the lack of certain sounds in native languages results in pronunciation challenges in English, thereby impacting intelligibility and accent influenced by native phonetic characteristics.

The participant said that Bugis speakers can typically articulate all English phonemes distinctly. He observed that the /r/ sound in Bugis is far more robust and powerful than the more subdued or diminished /r/ in English. This suggests that L1 pronunciation patterns, especially in the pronunciation of certain consonants, might affect the pronunciation of English words by Bugis speakers.

Influence of L1 stress, rhythm, and intonation

The impact of stress, rhythm, and intonation significantly affects the participants' English performance. Participants showed challenges with English stress patterns and rhythm as a result of the effect of their first language. In contrast to English's stress-timed rhythm, several participants' native languages use a syllable-timed rhythm, resulting in inappropriate emphasis placement. English requires a natural variation between stressed and unstressed syllables, but other participants' home languages emphasize all syllables identically, leading to a monotonous intonation. Moreover, several individuals said that their native intonation patterns affected their English pronunciation, making their speech strange. The intonation patterns of their home language immediately influence their English speech, perhaps resulting in misunderstandings owing to improper stress placement or odd tone variations.

Participant E (Ambonese Malay speaker) noted the strong influence of her native language on her English stress, rhythm, and intonation, particularly through her distinct Ambonese Malay accent, which she finds difficult to separate from her English pronunciation. Participant F (Bugis speaker) highlighted that the regional variations in Bugis affected English pronunciation differently, with some regions near Makassar producing an accent flow similar to a Korean accent. Participant A (Javanese speaker) mentioned that her *medhok* accent impacted her English pronunciation while learning the language but she adapted over time, using varied stress and intonation based on context. Participant B (Sundanese speaker) described his native accent as flat and monotonous, affecting his English intonation especially when nervous. Overall, the responses reveal that native linguistic influences are significant in shaping English pronunciation patterns among the participants, with variations noticeable across different language backgrounds and situations. The Ambonese Malay accent is loud, the Bugis accent varies regionally, the Javanese *medhok* accent alters stress patterns, and the Sundanese accent tends to flatten intonation, all of which can persist in proficient English speakers during spontaneous or emotionally charged speech.

Pronunciation learning strategies and classroom practice

Study participants used a variety of strategies aimed to enhance their English pronunciation, thereby mitigating the limitations presented by their first language (L1) impact. Essential strategies included emulation of native speakers, immersion in media showcasing actual English discourse, and persistent practice of difficult phonemes. Many people acknowledged the significance of self-awareness in their pronunciation efforts, such as identifying their mispronunciations and deliberately modifying their speaking patterns to improve clarity. One participant (E) had significant improvement by engaging with English films, using them to acquire new vocabulary while confirming pronunciation via internet tools. In a classroom setting, E used a repetition approach by instructing students to repeat their words, in order reinforcing correct pronunciation.

Another participant (F) used their environment, stating that being in a region rich with native English speakers enhanced their pronunciation proficiency. Through diligent listening to native speakers and seeing English films, F gained the capacity to self-correct their pronunciation. They enhanced learning using internet resources such as Google to verify their pronunciation of challenging terms.

Participant (A) emphasized the efficacy of digital dictionaries, which allowed them to audibly rehearse word pronunciations until they could articulate them correctly. They emphasized the need of consistent practice, especially alongside colleagues, in order to improve progress.

A Sundanese participant (B) observed that seeing English films with subtitles facilitated the alignment of their speech with written forms, so markedly improving their learning experience. Moreover, they used music as an educational tool, engaging with song lyrics while listening, which offered an organic and pleasurable approach to enhancing their pronunciation. This method, along with constant media exposure, established an immersive educational setting. as the conclusion, the participants used self-directed learning techniques, integrating media exposure, repetitive exercises, internet resources, and collaborative partnerships to proficiently improve their English pronunciation abilities.

Motivation Linked to Professional Identity

Motivation provides essential assistance for learning. An intriguing aspect identified in the data is the influence of motivation on pronunciation correctness, which reflects the identity of EFL learners. One participant, a Bugis speaker (F), indicated minimal pronunciation difficulties despite the impact of his L1. In contrast to other participants who had challenges with certain English phonemes due to their home language backgrounds, this individual exhibited a strong personal motivation to achieve accurate pronunciation, as expressed below.

> "I feel embarrassed as a teacher if my pronunciation is wrong, since my students might imitate it, so I have to find out the correct way to say it. When I come across a new word, I usually look it up on Google right away and repeat it." – Bugis speaker (F)

He highlighted that, as an educator, he felt responsible for providing a precise pronunciation for his students. His concern over mistakes in front of his students drives him to diligently pursue accurate word pronunciation. When discovering unfamiliar terms, he promptly utilizes internet

tools such as Google to ascertain the correct pronunciation and then replicates it. This discovery highlights the influence of personal desire and professional obligation on pronunciation acquisition. The participant's dedication to self-correction and ongoing education indicates that motivation may be an important part in overcoming pronunciation difficulties, without regard to L1 impact.

This discovery highlights the influence of personal desire and professional obligation on pronunciation acquisition. The participant's commitment to self-correction and continuous learning suggests that motivation significantly contributes to surmounting pronunciation challenges, regardless of L1 impact.

Acoustic validation with PRAAT analysis

To validate the interview findings, vowel formant analysis was conducted using PRAAT. Results confirmed measurable deviations between participants' vowels and native English benchmarks, particularly in terms of tongue height (F1) and frontness (F2).

An interesting phenomenon emerged from the acoustic 41 analysis of their English vowel articulation using PRAAT. This analysis compared the participants' vowel formants, specifically the F1 and F2 frequencies when pronouncing the word "fun. " The vowel /ʌ/ in 'fun' is commonly used in acoustic phonetic analysis to examine tongue height (F1) and backness (F2). These formants were then compared with native English speaker benchmarks to observe how closely the participants' articulation matched native-like pronunciation.

Table 1. *Summary of vowel formant analysis by L1 background*

Participant L1	Example Vowel	Native Benchmark (F1/F2 Hz)	Participant Value (F1/F2 Hz)
Ambonese Malay (female)	/ʌ/ (fun)	F1=1083 / F2=1761 (female)	F1=790 / F2=1557
Javanese (female)	/ʌ/ (fun)	F1=1083 / F2=1761 (female)	F1=490 / F2=1555
Bugis (male)	/ʌ/ (fun)	F1=1090 / F2=1530 (male)	F1=761 / F2=2045
Sundanese (male)	/ʌ/ (fun)	F1=1090 / F2=1530 (male)	F1=700 / F2=1804

Participant 1, a speaker of Ambonese Malay, exhibited an F1 of 790.12 Hz and an F2 of 1557.10 Hz, in contrast to a reference female native speaker (F1: 1083 Hz; F2: 1761 Hz). The results indicate that her vowel production was moderately lower in both F1 and F2 compared to the native target, suggesting a slightly higher and more fronted articulation that remains relatively close to the native reference. Participant 2, a Javanese speaker, exhibited an F1 of 490.71 Hz and an F2 of 1555.65 Hz, in contrast to the reference female native speaker (F1: 1083 Hz; F2: 1761 Hz). The significantly lower F1 and marginally lower F2 indicate that her production of /ʌ/ involved a considerably elevated tongue position and slight fronting compared to the native articulation, demonstrating a marked deviation from the native-like target. Participant 3, a Bugis speaker, exhibited an F1 of 761.08 Hz and an F2 of 2045.44 Hz in contrast to a male native speaker reference (F1: 1090 Hz; F2: 1530 Hz); the reduced F1 suggests an elevated tongue position, while the significantly increased F2 denotes a considerably fronted vowel, a formant pairing that diverges markedly from the male native standard. Ultimately, Participant 4, a speaker

of Sundanese, generated an F1 of 700.70 Hz and an F2 of 1804.96 Hz when compared to the same male native reference (F1: 1090 Hz; F2: 1530 Hz); similar to the Bugis speaker, he demonstrated a reduced F1 and an elevated F2 relative to the native male, signifying a higher, more fronted articulation and a distinct divergence from native standards.

The formant analysis shows that none of the participants fully matched the formant patterns of native English speakers. Most participants articulated the vowel /ʌ/ with a higher tongue position (indicated by lower F1) and more fronted placement (indicated by higher F2), reflecting the influence of their L1 phonological systems. Therefore, while some participants, such as the Ambonese speaker, were relatively closer to native-like production, the results indicate that all participants exhibited deviations from native English pronunciation patterns when analyzed acoustically.

Discussion

Theoretical and practical implications

This research investigated the influence of L1 interference on the pronunciation of pre-service English teacher students by combining perceptual data with audio evidence. The findings demonstrate that pronunciation challenges are systematic and affected by learners' first language (L1), showing in both segmental and suprasegmental aspects. These results underscore the complex relationship among language restrictions, learner awareness, strategic use, and professional identity.

Perceived pronunciation difficulties and language awareness

Participants consistently reported pronunciation as a major challenge in their English learning process. Unlike vocabulary or grammar, pronunciation errors were described as more "visible" in communication, immediately exposing learners' non-native status and often leading to breakdowns in understanding. Several participants admitted feeling self-conscious about their accents, expressing those mispronunciations sometimes led to embarrassment in classroom presentations or when interacting with peers.

This self-awareness is consistent with Gilakjani (2012), who emphasized that learners' recognition of their own pronunciation challenges is an important step toward improvement. Awareness was not only passive but also evaluative; participants could identify specific sounds they struggled with, such as the interdental fricatives /θ/ and /ð/. This supports findings by Derwing and Munro (2015), who argue that learners' ability to perceive their own errors plays a crucial role in intelligibility development.

Globally, similar findings have been reported. For instance, in Chinese EFL contexts, Li (2019) observed that learners were aware of their tonal interference in English intonation, but despite awareness, correction remained challenging. This suggests that pronunciation awareness is necessary but not sufficient; it must be accompanied by targeted instruction and practice.

Difficulties with English phonemes not present in L1

These findings strongly reflect negative transfer from L1, supporting Selinker's (1972) Interlanguage Theory, which emphasizes that learners construct a "transitional linguistic system" influenced by both L1 and L2 rules. Similar observations have been reported by Astuty (2022)

and Nurpahmi (2013), who documented consistent replacement of English fricatives among Buginese learners. Segmental difficulties were particularly salient. Each L1 background shaped a distinct set of pronunciation problems:

a. **Sundanese** participants regularly substituted /f/ with /p/, reflecting the absence of /f/ in Sundanese phonology. This substitution often reduced intelligibility, particularly in minimal pairs such as *fine* vs *pine*.
b. **Javanese** speakers frequently added vowels after word-final consonants, a strategy known as epenthesis. For example, the word *stop* was often produced as *stopə*. This reflects Javanese phonotactics, which disallow final consonant clusters (Dardjowidjojo, 2009).
c. **Buginese** speakers struggled with interdental fricatives (/θ/ and /ð/), replacing them with alveolar plosives (/t/ and /d/). Words such as *think* became *tink*, and *this* became *dis*. This mirrors findings by Nurpahmi (2013), who documented similar substitutions among Buginese learners.
d. **Ambonese Malay** speakers displayed vowel quality deviations, especially in high front vowels like /i:/. Their productions showed lower F2 values, making the vowel sound less fronted and closer to /ɪ/.

These findings corroborate cross-linguistic research. For example, Spanish learners of English often substitute /v/ with /b/ due to the absence of /v/ in Spanish (Mompeán, 2004). Similarly, Japanese learners face persistent difficulties with /l/ and /r/ (Ehrlich & Avery, 1992). Thus, the Indonesian learners' challenges are part of a broader phenomenon: when L2 phonemes do not exist in L1, learners tend to assimilate them into the closest available category, leading to systematic mispronunciations.

Influence of L1 stress, rhythm, and intonation

While segmental issues are prominent, suprasegmental features also significantly impact intelligibility. Participants reported difficulties in producing English stress patterns, rhythm, and intonation. Sundanese participants described their English speech as "flat" and "monotone," directly transferring their native intonation into English. Javanese participants, meanwhile, applied a syllable-timed rhythm to English, which conflicted with the stress-timed rhythm characteristic of English.

Such suprasegmental transfer is particularly problematic because it affects global intelligibility. As Derwing and Munro (2015) argue, misplaced stress or unnatural rhythm can be more detrimental to comprehension than individual sound errors. For instance, one participant noted that their listeners sometimes understood individual words but found their sentences "strange" or "unnatural," leading to misinterpretation of meaning.

These findings are consistent with Çam (2023), who highlighted that rhythm and stress differences often hinder communication in EFL contexts. Similarly, in Turkish learners, he reported that inappropriate stress placement often caused misunderstandings even when all individual phonemes were correct.

Thus, the Indonesian context underscores the necessity of suprasegmental training in teacher education programs. Without explicit attention to rhythm and intonation, learners may continue to produce English speech that is intelligible only at a word level but not at a discourse level.

Pronunciation learning strategies and classroom practice

Learners employed a range of strategies such as listening to English songs, repetition, using dictionaries, and imitating native models. In classroom settings, teacher praise and peer support encouraged persistence. These strategies align with Szyszka (2015) and Sardegna (2022), who emphasize self-monitoring and learner autonomy in pronunciation improvement. Despite these difficulties, participants actively employed strategies to improve their pronunciation. Strategies included:

a.Listening to and singing along with English songs.
b. Repetition and drilling of unfamiliar words.
c.Checking pronunciation via online dictionaries or Google Translate.
d. Receiving and providing peer feedback in classroom activities.

Classroom practices also played a motivational role. For example, one participant described how teachers' praise and encouragement, such as asking peers to applaud correct pronunciation, boosted their confidence. These findings correspond with Szyszka (2015), who highlighted the role of self-monitoring, and Sardegna (2022), who emphasized strategy-based instruction in fostering learner autonomy. Thus, although L1 interference created persistent errors, participants were not passive recipients of these influences. Instead, they engaged in conscious, strategic efforts to enhance their pronunciation, demonstrating agency in overcoming challenges.

Motivation as an additional finding

An additional theme that emerged was motivation tied to professional identity. As pre-service teachers, participants felt a strong responsibility to improve their pronunciation for the sake of their future students. Several expressed concern that if they consistently mispronounced words, their future learners would adopt the same errors.

This sense of accountability reinforces the findings of Almusharraf (2024), who reported that teacher identity is a powerful motivator for pronunciation learning. Unlike instrumental motivation (e.g., learning English for travel or exams), the motivation here was pedagogical and identity-driven. Participants saw themselves not only as learners but also as future models, which heightened the stakes of achieving accurate pronunciation.

Acoustic validation and methodological contribution

The incorporation of acoustic analysis using PRAAT offers robust empirical validation for the perceptual results. The noted discrepancies in vowel formant values (F1 and F2) validate that pronunciation variations are not just subjective but can be quantified empirically. This endorses methodological triangulation, integrating qualitative insights with quantitative phonetic data to enhance the validity of the conclusions. The research correlates learners' reported challenges with quantifiable auditory variations, so enhancing the comprehension of L1 interference in pronunciation.

Limitations of the study

Despite its contributions, this research has several limitations that need acknowledgment. A significant limitation is to the representation of academic individuals' language backgrounds.

Despite the participants originating from various regional language groups, the research still lacks a suitably organized grouping that comprehensively reflects the extensive typological variety of languages across Indonesia.

A systematic categorization based on central, west, and eastern linguistic areas would provide a better analytical framework for comprehending the effect of L1 traits on English pronunciation. This grouping is especially significant due to the typological variations across Indonesian languages. Languages in western Indonesia often adhere to a Verb–Object (VO) structure, although several languages in eastern Indonesia have Object–Verb (OV) characteristics. These typological differences are not only linguistic; they also include larger cultural and identity-related characteristics that may influence phonological patterns and speech output.

The lack of this typological mapping constrains the analytical depth in elucidating the interaction between regional language systems and English phonology. Future study should use a more representative and typologically informed sample approach to provide a comprehensive understanding of L1 interference across various Indonesian settings.

Conclusion and recommendations/implications

This research investigated the influence of L1 interference on the pronunciation of pre-service English teachers in the Indonesian EFL environment. The results indicate that L1 interference substantially influences both segmental and suprasegmental elements of speech, shown by systematic replacement patterns, prosodic transfer, and quantifiable discrepancies in vowel production revealed by acoustic analysis. The research emphasizes the significance of learner-related elements, such as pronunciation awareness, strategic use, and motivation associated with professional identity, which facilitate learners' endeavors to enhance their pronunciation despite ongoing difficulties.

These results indicate significant pedagogical implications for EFL teacher education. Pronunciation training must be approached more methodically, with specific focus on both segmental and suprasegmental elements, especially those affected by learners' L1 backgrounds. Consistent with competency-based methodologies like *Kurikulum Merdeka*, pronunciation instruction may be included as contextually relevant and practice-focused training. The use of technology instruments, such as PRAAT, may enhance pronunciation acquisition by offering visual and auditory feedback, facilitating more objective and reflective practice. Furthermore, using learners' professional identity as prospective educators may act as a significant motivating asset in enhancing pronunciation proficiency, emphasizing intelligibility over native-like precision.

This research has major limitations. The limited size and homogeneity of the sample restrict the applicability of the results to larger EFL populations. The emphasis on L1 interference may not adequately consider other affecting variables, such as learners' exposure to English or previous teaching experiences. Furthermore, dependence on regulated speech data and acoustic analysis may inadequately reflect pronunciation proficiency in spontaneous discourse. The cross-sectional design restricts understanding of developmental changes over time.

Future research needs to incorporate broader and more varied participant groups, along with longitudinal designs, to investigate the evolution of pronunciation across time. Subsequent research may investigate the efficacy of specialized instructional interventions, such as

suprasegmental-focused training and the incorporation of acoustic or AI-based feedback technologies, to enhance pronunciation learning in the Indonesian EFL environment.

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