

EXAMINING CONSONANT FOSSILIZATION IN EFL TEACHERS' PRONUNCIATION: INSIGHTS FROM A CASE STUDY OF A PRIVATE HIGH SCHOOL IN YOGYAKARTA

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Article Info

Article History

Received: December 2025

Revised: January 2026

Accepted: February 2026

Published: April 2026

Keywords

Consonants;

EFL teachers;

Fossilization;

Pronunciation errors;

Abstract

Although fossilization is a well-studied aspect of interlanguage among learners and teachers, consonant fossilization in the context of EFL teachers' classroom practices remains under-explored. Since, Existing literature has primarily focused on EFL students, while EFL teachers are often assumed to possess near-native pronunciation. Within in SLA, consonant fossilization is significant because the stabilization of non-target phonological patterns can shape learners' interlanguage development. Moreover, in EFL contexts, where the EFL teachers serve as primary pronunciation models, fossilized consonant errors may affect comprehensibility and the quality of classroom input. This study drew on interlanguage theory, fossilization theory, and causal factors of fossilization theory, which provided a conceptual framework for analyzing the types of consonants fossilization and the causal factor. This qualitative case study aims to examine the types of consonant fossilization and the factors that cause these errors to persist. The collected data through classroom observation along with video recording and in-depth interview were analyzed using an interactive model by Miles et al., (2014) which includes data condensation, data display, and conclusion drawing & verification. The findings reveal that there are nine fossilized English consonants, namely /z/, /v/, /θ/, /ʒ/, /t/, /p/, /g/, /d/ and /b/. Environmental, cognitive, socio-cognitive, and habitual or automatized factors have contributed to the fossilization among EFL teachers. It suggests that by increasing their awareness of English pronunciation, particularly of fossilized consonant sounds, teachers improve their teaching effectiveness. It implies the importance of strengthening pronunciation competence through targeted training and ongoing professional development in EFL contexts.

How to cite: Savira, A., Surono, S., & Abbas, A. (2026). Examining Consonant Fossilization in EFL Teachers' Pronunciation: Insights from a Case Study of a Private High School in Yogyakarta. *JOLLT Journal of Languages and Language Teaching*, 14(2), 627-640. Doi: <https://doi.org/10.33394/jollt.v14i2.18923>

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INTRODUCTION

In learning English, pronunciation is one of the most important and noticeable aspects (Antaris & Omolu 2019; Gumelar & Riandi, 2021). It also serves as a crucial component in teaching English as a foreign language (EFL), thereby requiring EFL teachers to possess clear and accurate pronunciation. Within the classroom, teachers act as guides and primary models for students in articulating English words. Moreover, it is crucial to note that the role of teachers is to serve as facilitators, learning resources, mentors, partners, and role models for their students (Oktaviana et al., 2020; Yestiani & Zahwa 2020). Nevertheless, a long teaching experience does not always correlate with a teacher's proficiency in their field, as senior teachers have the potential to develop fossil shells or experience stagnation despite their

teaching experience (Toloczko, 2024). Furthermore, some teachers still have trouble pronouncing English words accurately. Huda & Dewanti (2022) showed that errors made by EFL teachers could occur in various aspects of language, including pronunciation. One area where teachers often struggle with their pronunciation is consonant sounds. Consonants refer to speech sounds that are articulated by blocking half or all of their airflow, leading to different sound patterns (Wiranda et al., 2023). Fromkin et al., (2013) explain English consonant sounds are classified into three types: place of articulation, manner of articulation, and voicing. Based on place of articulation, consonant sounds are divided into bilabial, labiodental, interdental, alveolar, palato-alveolar, palatal, velar, and glottal. Based on the manner of articulation, consonants can be stops, fricatives, affricates, nasals, liquids and glides. Meanwhile, in the voicing, consonants are divided into voiceless and voiced. These include /p/, /b/, /t/, /d/, /k/, /g/, /f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ/, /ʒ/, /h/, /m/, /n/, /ŋ/, /l/, /r/, /w/, and /j/. There are differences between the consonant systems in English and Indonesian, causing difficulties for Indonesians in pronouncing English consonants correctly (Yagi & Rosari, 2023). When the consonant errors occur repeatedly while EFL teachers are teaching, these repeated errors will persist and become habitual and potentially become fossilized even though the language learners have practiced and been exposed to the language for a long period of time (Toloczko, 2024).

Fossilization is a part of interlanguage, which is a temporary linguistic system that emerges in the process of second language acquisition (SLA), which has its own rules and differs from both the first language and the target language. Fossilization is dynamic because it continues to develop along with the learner's increasing experience and input (Selinker, 1972). Moreover, Demirezen (2010) states that, fossilization is the result of inaccuracy, unintelligibility, and disfluency in the pronunciation of foreign languages, despite constant practice. In other words, a language learner's exposure to and study of a language over a long period of time does not ensure that the learner will achieve native-like fluency due to certain aspects. Additionally, errors in linguistic features, including pronunciation in language learners, which become permanent habits, are referred to as interlanguage fossilization (Aini et al., 2020). And, fossilization occurs due to the factors that influence and inhibit a learner's language development (Han, 2004).

The factors that cause fossilization in language learners can be based on internal and external factors. The internal factors include cognitive, socio-cognitive, and neurological factors, while the external factors include environmental factors, input, and instruction (Han, 2004). Furthermore, another factor causing fossilization is the cessation of SLA mechanisms after the language learner reaches puberty, first language transfer (native language), unfavorable language input quality, lack of informative feedback from teachers, and the L2 learner's lack of intrinsic motivation (Gao, 2020). This causal factor can lead to repeated errors in the pronunciation of the L2, known as phonological fossilization. Phonology is essentially concerned with the description of the systems and patterns of speech sounds within a language (Yule, 2010, p.42). It enables language learners to recognize how variations in sounds, such as /p/, /b/, and /f/, function to differentiate word meanings, as illustrated by the contrast among pat, bat, and fat. Thus, phonological fossilization is a phonological error that occurs repeatedly, causing pronunciation errors in L2 acquisition, caused by the influence of the L1 (Wei, 2008).

Errors in English pronunciation can be attributed to the linguistic differences of phonological systems of the native language and the target language (Firdaus & Milal 2021; Oktira & Rangkuti 2022). For example, in Indonesian, there are no consonants /θ/ and /tʃ/, which are found in English. These differences can lead to phonological fossilization for Indonesian learners of English when pronouncing words that contain these phonemes. Sayogie and Adbaka (2022) showed that EFL learners had difficulty in pronouncing minimal pairs of consonants such as /d/ & /ð/ and /f/ & /tʃ/. Furthermore, another research also showed that the errors on English sounds such as vowel and consonants on students' pronunciation have

become fossilized (Aryati et al., 2023). Pronunciation errors in an L2 are encountered not only by EFL learners but also by EFL teachers and have become fossilized as research conducted by Aredidon et al., (2024) and Topal (2024). Furthermore, Febrianto (2021), stated that errors in English word pronunciation by EFL teachers were caused by linguistic factors, specifically the influence of an individual's first language.

The cause of errors in pronouncing consonant sounds in English does not occur due to differences in consonants between Indonesian and English, but also Javanese as the native language of the research participants. Dissimilarities in phonetic features in Javanese, English, and Indonesian, specifically in the consonant /f/, /v/, /ʃ/, /dʒ/, /θ/, and /ð/, have caused pronunciation errors in words containing these consonant sounds, which have become fossilized, as indicated by the learners' tendency to produce them in Javanese-like sounds instead of English (Senowarsito & Ardini, 2019). In addition, voiceless stops such as /p/, /t/, /k/ are potentially fossilized because these consonants are often mispronounced (Thamrin et al., 2022; Senowarsito & Ardini 2019). Furthermore, the consonant sounds /f/, /v/, /ʒ /, /z/ and /s/ in English are also considered potentially fossilized in the context of EFL in Indonesia. The research findings by Situmeang & Lubis (2020) also indicated that the sounds /f/, /v/, /ʒ /, /z/ and /s/ were difficult to pronounce which was caused by the differences in sound distribution in consonant sounds, such as in the word "business" where the sound /z/ was changed to /s/ in the middle of the word. Therefore, unless these errors are corrected, there is a potential for consonant fossilization.

The issue of phonological fossilization is even more critical for EFL teachers, since they are not only people who use the language but also serve as pronunciation models for their students. In the classroom, teachers are expected to be able to use the language they teach effectively, and they are also responsible for guiding students in their learning process. The EFL teacher's role is not only to serve as a model or guide for students, but the teacher also has responsibilities in the teaching and learning process and acts as a resource, controller, and evaluator. Additionally, within the context of English language use in the classroom, students always imitate whatever the teacher has demonstrated (Dewi & Anwar, 2018). Therefore, a teacher must possess competence and comprehension of what is being taught, including the possession of accurate or well-produced pronunciation (Harmer 2007). Moreover, the effectiveness of learning and student quality are influenced by the teacher's competence (Mubarok 2024, Amaliah et al., 2024). This demands that EFL teachers be proficient in their competence as teachers, preferably in pronunciation without committing errors.

Although fossilization of pronunciation has been widely studied in English as a foreign language' (EFL) settings, existing studies have mostly focused on EFL learners (Senowarsito & Ardini, 2019; Ardini et al., 2022; Aryati et al., 2023). Some of these studies also link persistence of errors to factors such as interference from the first language (L1), habitual articulation patterns, limited corrective input, and environmental reinforcement (Lovenia & Jufriзал, 2021; Azman & Razali, 2024). Conversely, research involving EFL teachers has largely focused on intelligibility issues rather than conducting comprehensive phonological analysis (Aredidon et al., 2024). Consequently, the specific types of consonant fossilization and the internal and external factors that caused to it among EFL teachers, particularly in private school settings, remain under-explored. Through the analysis of consonant fossilization and its causal factors in a professional teaching setting, this study expands fossilization research into a more comprehensive view of phonological fossilization among experienced second language speakers, broadening the traditional learner-centered orientation. Noting this gap, this study addresses the following research questions: What are the types of consonant fossilization of the EFL teachers of a private high school in Yogyakarta in their classroom context? What are the factors that contribute to the fossilization of the EFL teachers of a private high school in their classroom context?

RESEARCH METHOD

Research Design

This case study aimed to explore types of consonant fossilization and the causal factors in a clearly defined case in depth (Cresswell, 2014). This study focused on EFL teachers in the classroom settings, due to the uniqueness that despite having taught for many years, they were still prone to errors in consonant pronunciation. A qualitative approach was used as this study was to understand and explore thoroughly the issues, experiences, phenomena, and perspectives experienced by the research participants (Cresswell, 2014). As opposed to other qualitative approaches, case study design can provide thorough investigation of specific language patterns particularly on the types of consonants fossilization and the interactions between internal and external factors that cause them, thereby providing a strong foundation for addressing the research questions. Although it allows for contextual and thorough investigation, the design of qualitative case studies is inherently context-dependent and does not aim for statistical generalization. Instead, the results depend on analytical generalization, which may limit their applicability in different situations.

The researchers in this study acted as non-participant observers during classroom sessions, allowing for close examination of authentic teaching practices. Since it provides comprehensive contextual insight into consonant fossilization in its natural setting. However, such involvement may also introduce potential observer bias, despite efforts to enhance credibility through systematic data analysis.

Participants

Two EFL teachers (EFLTs) abbreviated as T1 and T2 of a private high school in Yogyakarta were voluntarily recruited as the research participants. The criteria for research participants were active EFL teachers at a senior high school. The criteria were applied since the research by Safitri & Anwar (2021) has shown that senior high school EFL teachers used English more frequently in the classroom learning context. The two participants, T1 and T2, are both graduates of English Education programs. T1 has a Master of Education degree and approximately five and a half years of teaching experience. Meanwhile, T2 has a Bachelor of Education degree and 13 years of teaching experience in English as a foreign language (EFL) setting. In addition, both participants regularly participated in professional development activities, including seminars and workshops related to English pronunciation and teaching methodology. However, neither participant had received continuous or intensive phonological training specifically targeting consonant production.

Instruments

The researcher served as the key research instrument (Cresswell, 2014), as all the data were systematically collected, analyzed, presented, and interpreted throughout the study. The research instruments of this study were an observation checklist containing the possible consonant fossilization carried out by EFLTs, a video recorder and an interview guideline containing questions related to consonant fossilization factors that were asked to EFL teachers. In order to re-examining the consonant pronunciation observed during classroom teaching based on the initial analysis and to find fossilized consonant sounds that not have been identified in the data, the interviews also included several sentences containing the target consonant sounds.

The observation checklist was developed based on English consonant sounds that do not exist in Indonesian or are often considered difficult for Indonesian speakers of English as a foreign language (EFL). These sounds include interdental fricatives such as /θ/ and /ð/, labiodental /v/, postalveolar /ʃ/, voiced affricates /dʒ/, voiceless stop such as /p/, /t/, and /k/ in initial position, as well as voiced stops /b/, /d/, and /g/ in final position, which may cause difficulties related to aspiration and final consonant realization. These sounds were chosen for

their structural differences between the English and Indonesian phonological systems. The checklist was designed to identify recurring errors in the production of these consonants during classroom practice. In addition, the interview guidelines were developed based on Han's (2004) causal factor of fossilization theory, which outlines the external and internal factors that caused the fossilization. The questions cover participants' language learning background, exposure to English, experience with corrective feedback, professional development, their motivation and satisfaction, psychological aspect and language use in the classroom. And to ensure accuracy and cross-check the initial analysis, the sentences containing target consonant sounds were constructed based on several considerations. First, they included consonants that had not yet been identified as fossilized but showed potential for recurring errors. Second, they incorporated consonants already categorized as fossilized to verify the initial analysis.

Data Collecting Technique

The data collection was conducted through observation and recording the English language teaching activities carried out by the EFLTs in the classroom and an in-depth interview. Classroom observations were conducted using an observation checklist to record potential fossilized consonants in the teachers' spoken English. The observations were supported by video recordings to ensure accurate capture of pronunciation and allow detailed analysis of consonant production. The recordings, which lasted approximately 35-60 minutes, were analyzed comprehensively. During the analysis, the researcher identified consonant errors and noted them in the observation checklist. The transcription process was selective, only specific words identified as errors were transcribed rather than the entire session. In addition, the error pronunciation was compared with the correct pronunciation based on BrE from CDT. This comparison served to determine whether the consonant deviated from the standard pronunciation.

Furthermore, the interviews were conducted with the two EFLTs to explore the factors caused to consonant fossilization, guided by Han's (2004) framework. It was conducted with the aim to determine the causal factors of consonant fossilization. Moreover, the interviews also served to clarify and deepen the findings from the classroom observations and video analysis. As part of the interview process, the teachers were asked to read several sentences containing the target consonant sounds, including both previously identified fossilized sounds and those not yet identified. This procedure allowed the researcher to verify the initial analysis and detect any additional instances of consonant fossilization not captured in the earlier video-based analysis.

Data Analysis

The data were analyzed using the Miles' et al., (2014) interactive model, which consisted of three main components, including data condensation, data display, and drawing & verification of conclusions. In data reduction, the recordings were observed and analyzed comprehensively to identify which consonants had become fossilized in EFL teachers and its causal factors. The raw data from the observation checklist, classroom video recordings, and interviews were reduced by removing irrelevant information and organizing the data according to the types of consonant fossilization and the factors causing it. Consonant errors were identified by comparing the phonetic transcription of EFLTs' pronunciation error with BrE taken from the online version of CDT and removed inappropriate data. The interview results were also transcribed, analyzed, and summarized to identify the factors of fossilization. To distinguish fossilization from isolated mistakes, a consonant was classified as fossilized when the same sound occurred inaccurately at least three times. Then, the condensed and summarized data related to consonant fossilization were presented in a form of a table, and the data related to fossilization factors were explained in were described narratively with support from interview excerpts. And the conclusions were drawn from the analyzed data and verified

through comparison of findings from observations, video analysis, and interviews to ensure credibility. The validity of the data interpretation was ensured through expert judgment involving two lecturers in English Education with professional experience in teaching English pronunciation. Their assessment ensured that the classification of consonant fossilization types was appropriate and accurately identified.

RESEARCH FINDINGS AND DISCUSSION

Research Findings

The analysis identified six types of fossilized consonants involving nine distinct consonant sounds: the voiced alveolar fricative /z/, voiced labiodental fricative (/v/), voiceless interdental fricative /θ/, voiced post-alveolar fricative /ʒ/, voiceless stops in initial position /t/, /p/, and voiced stops in final position /g/, /d/, /b/. The analysis also identified the factors causing their persistence. These fossilized consonants were caused by both external and internal factors. The primary external cause was the linguistic environment, while the internal causes included cognitive factors, socio-affective factors, and habitual pronunciation patterns or automaticity.

Types of Fossilized Consonant of EFL Teachers

This study revealed that there are nine consonants that have become fossilized by EFL teachers, namely /z/, /v/, /θ/, /ʒ/, /t/, /p/, /g/, /d/ and /b/ based on the data collected. These sounds are grouped into six (Table 1), representing the fossilized consonants in EFLTs in their classroom context.

Table 1
Types of Consonant Fossilization

No	Types of Consonant Fossilization	The Fossilized Consonant	CDT/BrE	The Word
1.	Voiced alveolar fricatives /z/	/'mju:.sɪk/, /'ju:.sɪŋ/	/'mju:.zɪk/, /'ju:.zɪŋ/	Music, using
2.	Voiced labiodental fricatives /v/	/'ef.rɪ.wʌn/, /dɪ'fel.əp/	/'ev.rɪ.wʌn/ , /dɪ'vel.əp/	Everyone, develop
3.	Voiceless interdental fricatives /θ/	/tæŋk/, /'tɪŋ.kɪŋ/	/θæŋk/, /'θɪŋ.kɪŋ/	Thank, thinking
4.	Voiced palato-alveolar fricatives /ʒ/	/'les.ər/, /'tel.i.vɪs.ən/	/'leʒ.ər/, /'tel.i.vɪʒ.ən /	Leisure, television
5.	Voiceless stops /p/, /t/	/pɛn/, /pɪn/, /taɪm/	/p ^h ɛn/, /p ^h ɪn/, /t ^h aɪm/	Pen, pin, time
6.	Voiced stops (final position) /g/, /d/, /b/	/bæk/, /bæt/, /fu:t/, /dʒɒp/	/bæg/ /bæd/, /fu:d/, /dʒɒb/	Bag, bad, food, job

Source: results of observation and interview with EFL teachers

Table 1 shows that there are nine consonant fossilizations among EFLTs based on observations on them when teaching grades 10 and 11. As a result, nine consonants were identified that were mispronounced at least twice in different words, indicating that these consonants have become phonologically fossilized. This is in line with Wei (2008), who states that phonological fossilization is a condition in which a person repeatedly experiences phonological errors. Four of the nine consonants (/z/, /v/, /θ/, /ʒ/) that have been identified are consonant sounds that are absent in Indonesian and Javanese. These findings demonstrate that consonant fossilization is not restricted to learners but can also occur in experienced EFL teachers. The recurrent errors in interdental and voiced consonants suggest that certain

phonological features remain vulnerable even at advanced levels of professional language use. A more comprehensive account of these findings is presented in the following discussion.

The voiced alveolar fricatives /z/ error occurs due to interference from the EFL teachers' first language (L1), Javanese, and their second language (L2), Indonesian. This is reflected by the substitution of the /z/ consonant sound with the /s/ sound, whereas in English, spellings and pronunciations were different, and the same sound could be written with different letters and pronounced differently. By contrast, Indonesian has the same pronunciation as the writing shows. This is demonstrated by the pronunciation of the word *music* /'mju:.zɪk/ pronounced as /'mju:.sɪk/, using /'ju:.zɪŋ/ as /'ju:.sɪŋ/, result /rɪ'zʌlt/ as /rɪ'sʌlt/ and exposition /,ek.spə'zɪf.ən/ as /,ek.spə'sɪf.ən/. Whereas supposedly the letter s in those words should be pronounced as /z/, instead it was pronounced as /s/ which was caused by their L1 and L2 interference.

Fossilization in the voiced labiodental fricatives /v/ can be seen in the words *everyone* which is pronounced /'ef.rɪ.wʌn/ instead of /'ev.rɪ.wʌn/, *develop* /dɪ'fel.əp/ rather than /dɪ'vel.əp/, and *move* /mu:f/ instead of /mu:v/. This shows that the research participants replaced the /v/ sound with the sound most similar to the original sound, namely /f/ in Indonesian, as in Indonesian and Javanese the consonant /v/ does not exist. Despite the absence of these sounds in Indonesian, /f/ and /v/ are paired sounds that share the same place of articulation but have differences in voicing; /f/ is voiceless and /v/ is voiced. Therefore, due to the absence of the /v/ sound in the teachers' L1 and L2, they replaced it with the most similar sound.

Factor of Consonant Fossilization of EFL Teachers

Based on Han's theory (2004), this study identifies three factors that contribute to fossilization in EFL teachers when teaching in the classroom, namely environmental, cognitive, and socio-affective factors. However, apart from the factors mentioned by Han (2004), habitual patterns and automaticity also have a significant influence on this phenomenon. These phonological habits can be influenced by interference from the EFL teachers' L1 & L2 and are also affected by their working environment and everyday life. These results indicate that fossilization among EFL teachers is shaped by both internal and external factors. The findings show that professional experience may be insufficient to prevent fossilization without sustained phonological awareness and consistent corrective feedback. Accordingly, these explanations provide a basis for outlining the factors that contribute to consonant fossilization of EFLTs as elaborated in the following sections.

Environmental

The working environment or school where the research participants taught rarely held team teaching or similar activities where teachers could receive corrective feedback from colleagues, requiring teachers to conduct independent corrections or reflections when teaching in class. Consequently, the teachers were less aware of their consonant pronunciation errors during teaching, leading to these errors persisting and becoming fossilized. These points are further substantiated by the following data.

Data 1: *I have not been corrected yet. And I used to have conversations with native speakers while I was abroad, using English with an Indonesian accent, and they were fine with it. (T1)*

Data 2: *I rarely get corrections on how I pronounced English words. In school, we taught ourselves. So where did we get corrections from? Mostly from our own awareness, like, 'Oh, I pronounced that wrong.' That's how it was. (T2)*

However, they stated that although they rarely receive corrections from colleagues or students, they quite often attend activities such as seminars to improve their teaching skills. This argument is validated by the data presented below.

Data 3: *We quite often attend workshops, webinars, and so on, where the speakers are also native speakers.* (T2)

Thus, as supported by Data 1, 2, and 3, it can be concluded that EFLTs received a sufficient quantity and quality of authentic English input, not only in formal activities such as seminars but also in informal media such as songs and podcasts. On the contrary, they stated that they rarely received feedback on their English pronunciation, throughout their working environment and in their daily lives. This causes consonant fossilization in EFLTs.

Cognitive

Cognitive factors played a significant role in sustaining persistent consonant errors. More specifically, this cognitive influence was evident in knowledge representation, knowledge processing, and psychological factors.

Knowledge representation influenced how the teachers stored and internalized phonological forms. T1 and T2 stated that they theoretically understood and knew how to pronounce consonant sounds in English. Nevertheless, there is a gap between the knowledge representation and the EFLT productions of certain words containing consonant sounds, particularly in spontaneous speech during classroom teaching. This claim is illustrated in the data below.

Data 4: *Yes, I know and understand how consonants should be pronounced. Like, for example, the sounds /f/ and /v/, for example. Yes, I know. Yes. For example, the word 'very', and then maybe 'thank you'. Well, something like that.* (T2)

Data 4 indicates that their knowledge has not been transferred into their production skills. Furthermore, this has been a long-standing issue, considering that they have five to ten years of teaching experience. Therefore, it can be concluded that although EFLTs have sufficient theoretical understanding of phonology, they still experience consonant fossilization.

Knowledge processing, both receptive and productive, also affected fossilization. Even though they theoretically understand how to pronounce consonant sounds, they still think that when they practice and apply their understanding it is more difficult than when they correct other people's pronunciation, for example their students. It proves that there is a discrepancy between receptive and productive knowledge of EFLT who is unable to control the mouth, tongue, and articulators to produce consonant sounds correctly. Consequently, in the classroom practices, consonant sounds that have long been pronounced incorrectly emerge unconsciously, as substantiated by the following data 5.

Data 5: *Well, actually, it's just the pronunciation. It is more difficult.* (T1)

Proven based on data 5, it was discovered that they found it difficult to pronounce certain consonant sounds, which led to errors and were then fossilized. Thus, it can be concluded that EFLTs experienced consonant fossilization, specifically in consonant sounds that were absent in EFLTs' L1 and L2, as a result of inadequate knowledge processing.

Psychological factors further reinforced consonants fossilization errors in EFLTs. Difficulties in pronouncing words containing consonant sounds have caused EFLT to be nervous sometimes while teaching in the classroom. This can increase the chances of errors in pronouncing consonant sounds, even though they theoretically understand how these consonants should be pronounced. In addition, T2's perceived insecurity can also affect the performance and creates a situation that will reinforce their errors, causing it to be fossilized and difficult to correct. In other cases, in situations where the EFLTs excessively prepare themselves to avoid error and some students ask a question outside the material, will increase their nervousness, which affects the accuracy of their pronunciation. And this case lies within the psychological aspect, as shown in data 6.

Data 6: *I've been nervous during my classes before. Well, probably when I had a speaking class, I had to prepare myself beforehand. So, I wouldn't be nervous or insecure or something like that.* (T2)

As evidenced in data 6, it clearly shows that nervousness and insecurity, as part of psychological factors, also contribute to consonant fossilization. Hence, it is necessary to provide counseling to overcome these issues, rather than solely focusing on consonant pronunciation training for EFLTs.

Socio-affective

Beyond cognitive influences, socio-affective factors also contributed to the persistence of fossilized consonant patterns. The motivation and the priorities as an EFLT were also an influential factor involved in the occurrences of fossilization among them. The priority of the T1 in mastering English is not to have pronunciation like native speakers, but how to communicate effectively with students and others, even though they are aware of English pronunciation, especially in certain consonant sounds. The school requirement that EFLTs do not need to possess native-like pronunciation also caused them to lose motivation. In fact, as teachers, they are required to have adequate pronunciation as one of the components that must be possessed as an EFLT, as well as to deliver the material effectively, as indicated in Data 7 below.

Data 7: *Personally, I don't think it's necessary to have a native-like pronunciation, because English is not our native language, right? The more meaningful thing about learning a language, in my opinion, is its function. From my point of view, the essence of what I experienced in school was not about native-like pronunciation, but how we communicate effectively with other people and have good communication skills.* (T1)

Consequently, as shown in Data 7, the error in consonants and their perspectives demonstrates the belief of EFLT that effective communication is more important instead of the native-like proficiency. It has led to the errors persisting for a long time, developed and were fossilized. Conclusively, professional priorities and the lack of motivation have been identified as one of the causal factors of consonant fossilization in EFLTs. Moreover, the confidence and satisfaction of EFL teachers also indicate socio-affective factor, where both EFLTs feel that the pronunciation they have used when teaching in class has been effective in classroom teaching activities. The EFLTs believe that as long as their students understand, their current pronunciation is sufficient. In fact, based on the observation results, it was found that they experience fossilization, as can be observed in data 8 & 9.

Data 8: *I think it has been quite effective. Since effectiveness is not only measured by pronunciation. Pronunciation is still important, but later we will combine it with learning approaches and learning methods that support pronunciation teaching in the classroom.* (T1)

Data 9: *I think my current pronunciation is effective for communicating with students and fulfilling my role as a teacher. Why? My measurement is that my students understand. If the material being delivered is understood, then I think that is proof enough.* (T2)

As shown by T1 and T2 in data 8 and 9, they believed that their students' comprehension was their priority as EFL teachers, instead of pronunciation accuracy. This leads to their lack of commitment to improving pronunciation accuracy, which results in fossilization. Moreover, EFLTs' perception that their pronunciation is sufficiently effective hinders the noticing process, preventing them from recognizing that their errors in pronunciation need to be corrected.

In addition to socio-affective factor, habitual pronunciation patterns or automaticity further contributed to the persistence of fossilized consonant forms. It indicates that consonant fossilization in EFLTs was largely caused by habit. Both teachers stated that in their classroom practices, especially when delivering material to students, they frequently were unaware that they had repeatedly pronounced certain consonant sounds incorrectly while teaching in class, as reflected in the data below.

Data 10: *Yes, it's a reflex. But with awareness, over time, I might improve by maintaining more awareness.* (T1)

Data 11: *Yes, it's mostly by reflex. I didn't realize it, but later when I'm sitting still, I realized, 'Oh, right, that was missing, I didn't pronounce it with enough accent or tone.* (T2)

As evidenced in data 10 & 11, this may negatively impact students' speaking abilities and hinder their language development. As the teachers serve as models and learning resources for their students, exposure to incorrect pronunciation may lead students to imitate their teachers' pronunciation errors. Yet, as teachers are expected to stand as role models and sources of learning for their students, and to have a command of the material taught in class, they should prevent errors in consonant pronunciation (Oktaviana et al., 2020; Harmer 2007).

Discussion

This study was conducted with the aim of investigating consonant fossilization among EFL teachers in their classroom context and the factors influencing this phenomenon. The results of the study revealed that EFLTs of a private school in Yogyakarta experienced fossilization in their classroom context. There are nine consonant fossilization sounds produced by EFLTs, namely /z/, /v/, /θ/, /ʒ/, /t/, /p/, /g/, /d/ and /b/. The consonant fossilization arises from a complex interaction of environmental, cognitive, and socio-cognitive factors that collectively caused errors in consonant pronunciation to persist, even in teachers who are meta-linguistically aware and experienced, based on Han's (2004) theory. This emphasizes that the phenomenon of fossilization, especially in consonant sounds, not only happens to the beginning and intermediate level of second language learners, but it also happens to EFL teachers as the students' learning source in the classroom setting. This is proven by the findings of this study, which reveal consonant fossilization that happens during the EFLTs' explanation of the lessons and giving instructions to the students, which will negatively impact the students' pronunciation. Therefore, this study provides a new understanding that fossilization in EFLTs may have occurred since they were in the early stages of school. As a result, the EFLTs also experience fossilization in consonant sounds. This is consistent with the argument by Toloczko (2024) that over their career, teachers still have the potential to experience fossilization.

It was found that the consonant sounds /z/, /v/, /θ/, /ʒ/ have become fossilized due to phonological dissimilarity between Indonesian and English, thus these consonant sounds are replaced with sounds that are closer to or similar to their original sounds in English. The findings in this study are aligned with research by (Senowarsito & Ardini, 2019; Aryati et al., 2023) on EFL learners, which found the fossilization in the consonant sound /z/, /v/, /θ/, /ʒ/. These consonant sounds were replaced with the similar consonant sounds, showing /z/ changed to /s/, /v/ became /f/, /θ/ turned into /t/, and /ʒ/ was replaced with /s/, due to differences in consonant sounds and the absence of some consonant sounds in EFLTs' L1 and L2. The finding is consistent with Ristati et al., (2024) and Ardini et al., (2022), that errors in consonant sounds such as /v/, /θ/, /ʒ/ tend to be replaced with sounds that are more recognizable in their first language. Moreover, these consonant sounds are categorized as problematic and difficult to pronounce in an EFL context (Anjani et al., 2023). Furthermore, the consonant sounds /p/ and /t/ in the initial position were also found to be fossilized in this study as Thamrin et al., (2022) indicated that the consonant sounds /p/ and /t/ in the initial position are not pronounced with aspiration as they should be. These sounds tend to be pronounced as spelled without considering the appropriate pronunciation according to the phonetic transcription. Another consonant fossilization that has been identified is /g/, /d/, /b/ in the final position, which are also pronounced by EFLTs by their L1 and L2 phonological systems. In contrast, it is different from the findings of the study by Yagi & Rosari (2023), where the sound /d/ is one of the sounds that is pronounced correctly and there was no error in the pronunciation of consonant /d/. However, the previous studies have examined error and fossilization in teachers and

students who are generally still in their learning stage. In particular, students tend to make more errors in consonant sounds and even fossilize. This study provides a new insight by focusing on EFL teachers with 5 to 10 years of teaching experience who have more experience and knowledge than the students, yet still experience fossilization of consonant sounds in their classroom context when they explain the material and give instructions to the students, which negatively affects the students' pronunciation as well.

Further analysis of the interview revealed that the factors that caused fossilization in EFLTs were environmental (the lack of corrective feedback), cognitive (knowledge representation, knowledge processing (receptive/productive), psychological), and socio-affective (motivation & self-confidence/satisfaction) factors (Han, 2004) and habitual pattern or automaticity. The environmental, cognitive, and socio-affective factors were in line with a number of studies, such as Azman & Razali (2024) and Lovenia & Jufrizal (2021) studies on the factors of fossilization in EFL learners. Furthermore, Demirezen & Topal (2015) found that another factor identified as one of the causes of fossilization, especially among teachers, is age, which is in contrast to the findings in this study despite both studies having the same research subjects, which are EFL teachers. Contrastingly, in this study, it was found that EFL teachers, stated that they were more capable of self-correcting their pronunciation error as their use of English was more frequent when they became EFL teachers compared to when they were students, since as teachers they were required to communicate and interact in English practically every day with their students and colleagues, thus age was not included as a factor that caused fossilization.

It was identified that another factor causing consonant fossilization is the discrepancy between the receptive and productive knowledge of EFLTs. In addition, the interview results revealed that as an EFL teacher, their priority is to communicate effectively with others, including colleagues and students, and to ensure that the students understand the material taught in their classes. In contrast, the pronunciation of a word that contains English consonants is not prioritized. In fact, pronunciation is one of the important competencies that EFLT should achieve, which affects the language development of their students. These findings support the study by Din et al., (2025), who found that one of the contributing factors to fossilization in students is the late corrective feedback from the teacher, which is caused by the teacher's inadequate competency. This is also in line with Mubarok (2024), who states that the competence of teachers greatly influences the progression and quality of their students. Additionally, the fossilization that occurs between EFLT 1 (/z/, /v/, /θ/, /ʒ/) and EFLT 2 (/z/, /v/, /θ/, /ʒ/) tends to be consistent, indicating that the influence of the Javanese and Indonesian phonological systems as the EFLTs' L1 & L2 is one of the factors that has a considerable effect on consonant fossilization. It aligned with the work by Huda & Dewanti (2022) and Marzuki (2021), which stated that errors in pronunciation occurred as a consequence of interlingual transfer from L1 and L2 research participants. Therefore, it can be concluded that these factors influence the EFLTs language production system, causing errors in the pronunciation of words containing these consonant sounds to become an ingrained reflex in classroom activities.

CONCLUSION

This study concludes that EFL teachers at a private high school in Yogyakarta experience nine fossilized consonants in their classroom context, namely voiced alveolar fricatives /z/, voiced labiodental fricatives /v/, voiceless interdental fricatives /θ/, voiced palato-alveolar fricatives /ʒ/, voiceless alveolar stops (initial position) /t/, voiceless bilabial stops (initial position) /p/, voiced velar stops (final position) /g/, voiced alveolar stops (final position) /d/ and voiced bilabial stops (final position) /b/. These fossilized consonants are primarily caused by interference from Javanese and Indonesian as the L1 and L2 of the EFL teachers, consequently the consonant fossilization is replaced with sounds that are more familiar in their L1 and L2. Furthermore, this study also identifies that consonant fossilization is the result of

interrelated factors such as the lack of corrective feedback, knowledge representation & representation, motivation, confidence & satisfaction, as well as habitual pattern and automaticity. Collectively, these factors interact and create a system that causes this phenomenon. Therefore, pedagogical intervention with a holistic approach is needed to minimize this phenomenon.

Additionally, this study carried important practical implications for EFL teachers. Enhancing pronunciation awareness through reflective practices, such as reviewing recorded classroom speech, and engaging in focused practice on vulnerable consonants may help reduce persistent errors. A supportive feedback-oriented teaching environment is also essential for sustained improvement. In addition, structured professional development programs that emphasize phonological awareness and ongoing pronunciation training are necessary to prevent the long-term stabilization of fossilized consonant patterns. The findings further emphasize that consonant fossilization may persist even among experienced EFL teachers. Professional experience does not automatically ensure pronunciation accuracy; ongoing phonological awareness, consistent corrective feedback, and targeted professional support remain essential in addressing and preventing fossilized consonant patterns in EFL contexts.

INFORMED CONSENT STATEMENT

Participation in this study is entirely voluntary. By agreeing to take part, the participants acknowledge that they have been informed about the purpose, procedures, potential risks, and benefits of the study. Participants understand that their identity are kept confidential and that all information they provide are used solely for research purposes. They have the right to withdraw from the study at any time without any penalty or loss of benefits to which they are otherwise entitled. By continuing, they give their informed consent to participate in this research under the conditions described.

DATA AVAILABILITY STATEMENT

The data utilized in this study cannot be made publicly available due to strict adherence to privacy concerns and ethical obligations that safeguard participant confidentiality. This ensures compliance with ethical research standards and data protection regulations

DECLARATION OF AI-ASSISTED TECHNOLOGIES

In order to improve the clarity and readability of the manuscript, artificial intelligence (AI) tools were used appropriately. Additionally, the content in the manuscript has been thoroughly reviewed, revised, and refined by the researchers.

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