

## Phonological Fossilisation of EFL Learners: The Interference of Phonological and Orthographic System of L1 Javanese

SENOWARSITO

*Universitas PGRI Semarang, Indonesia*

SUKMA NUR ARDINI

*Universitas PGRI Semarang, Indonesia*  
*sukmanurardini@upgris.ac.id*

### ABSTRACT

*This paper discusses the interference of phonological and orthographic systems of the mother tongue on phonological fossilisation of English on Foreign Language learners in Javanese contexts. 25 fourth-semester university students were selected as respondents. The data were collected by means of pre-test and post-test on pronouncing isolated words, continuous speeches, and reading aloud on manipulated short text. Contrastive analysis reveals that the phonological fossilisation among Javanese students commonly occurred in continuous speech rather than isolated words when they pronounced vowels /æ/, /ɪ/, /ə/, /ʌ/, /i:/ in initial and middle position; diphthongs /əʊ/, /eɪ/, /aʊ/ in initial and middle; as well as consonants /dʒ/, /f/, /θ/, /ð/, /ʃ/, /v/, /ʒ/, /z/, /k/, /t/ in initial, middle and final ones. The students tended to omit 'θ', 'd' and 't' in final position, 'consonant clusters in initial, mid, final position', and /j/ after plosive bilabial'. Those phonological fossilisations were due to the interference of the phonological and orthographic systems of their mother tongue.*

*Keywords: EFL learners; interference; fossilisation; phonological system; orthographic system*

### INTRODUCTION

The aims of teaching English for non-native English learners emphasize communicative competence, considering the learner's proficiency in using English to participate in English speakers' society. Celce-Murcia (2007) indicates that the main competence in communicative competence is discourse competence. Discourse competence will be achieved not only by socio-cultural competence, strategic competence, formulaic competence, and interactional competence, but also linguistic competence. Linguistic competence refers to understanding and mastery on using language aspects like pronunciation, spelling, and arranging words into phrases, phrases into clause, and clauses into paragraph in the target language. The linguistic competence has great prominence as a factor for the speakers to express their ideas, thought, and feeling when they communicate in English.

Learning English as a foreign language implies that the learners have to interact with some language aspects. Pronunciation should be put on the same level as other aspects in English competence, such as vocabulary, grammar, reading, listening, writing, and speaking. Their oral production would be more understandable if it is similar or closes to the native speaker's pronunciation. Nevertheless, it was found that Javanese learners had problems in pronouncing English words or phrases in continuous speeches. In some extents, inaccurate pronunciation of English words is still acceptable for communication as it does not change meanings, but in other extents, inaccurate pronunciation causes difficulties in understanding the meaning of words, for example <thought> which is pronounced to [tɔg] or <bought> to [bɔg]. Kirkpatrick (2010) considers those inaccurate pronunciations as one of the characteristics of English which affects intelligibility and is mainly caused by idiosyncratic pronunciation of each individual speaker of English.

The mother tongue or first language (L1) is one of the prominent factors affects learners in foreign language (FL) or second language (L2) acquisition process (Littlewood

1984, Selinker 1972, Ellis 1994, Brown 2000, McCarthy 2001, Chaira 2015). Learners' cognitive on their L1 will interfere to their pronunciation of FL words or phrases. In our English phonology classes, we found that our Javanese adult students had problems in pronouncing the word <the>. They tended to pronounce [(n)ðə] for the word <the> with the phoneme /n/ that precedes [ðə], instead of [ðə] alone. Such mispronunciation was affected by their cognitive on L1 (Javanese) since they were used to pre-nasalize consonant [ð] in initial Javanese words, such as <delok> [nðə.lək] 'see' or <demok>[nðə.mək] 'touch' . It also happened on the word <wear>, which was pronounced [wir], instead of [weər]. It was because of the absence of diphthong /eə/ in Javanese. In fact, they were exposed intensively to the correct pronunciation of <the> in learning process, but they mispronounced it, especially in continuous speech.

Previous researches conducted in other areas in Indonesia show similar problems faced by EFL learners as the influence of their L1. L1 learners have some difficulties in learning FL, particularly in learning sound systems since L1 has its own sound systems that are different from FL (Andi-Pallawa 2013). Yuliati (2014) identifies that Indonesian speakers of English may find some difficulties in pronouncing certain English types of consonant clusters, such as <squeeze>, <structure>, <screw>. English allows three consonants which function as a syllable onset like /s/, can be followed by one of the voiceless stop consonants /p/, /t/, or /k/ and one of the approximants /l/, /r/, /w/, or /j/. *Bahasa Indonesia* has /s/ in the onset position, but it is not a component of a consonant cluster unless the next consonant after it is a liquid one. Indonesian speakers add or insert a vowel sound between two consonants or epenthetic sound, as in the word 'stamp' may be pronounced [sətæmp] instead of [stæmp]. Furthermore, English allows for final consonant clusters, especially related to the plural and past forms, as /s/ or /z/ to show a plural form and /t/ or /d/ to show past forms, but not in *Bahasa Indonesia*. As a result, the plural or tense marker is often absent in their speech in English. The interference may also occur when there are some English sounds that do not occur in *Bahasa Indonesia* like /ph/, /th/, /θ/, /ð/, /i:/, /ʊ/, /u:/, /æ/, and /e/. Nani and Arlene, (2008) found that the Indonesian students will pronounce these with sounds that exist in *Bahasa Indonesia* which are closest to them. In different areas of Indonesia, Chaira, (2015) identifies that the interference from the L1 occurs in the pronunciation of English segmental sounds produced by the Acehese students at Darul Ulum Islamic Boarding School. They are /p<sup>h</sup>/, /t<sup>h</sup>/, /k<sup>h</sup>/, /f/ for grapheme /p<sup>h</sup>/, /v/, /θ/, /ð/, /z/ for grapheme /s/, /ʃ/, /ks/ for grapheme /x/, and /i:/, /u:/, /æ/, and /e/.

Those findings gave a brief description on how L1 (*Bahasa Indonesia*) interfered to learner's pronunciation of English. They considered *Bahasa Indonesia* as L1 which was the prominent source of interference without considering their native or regional language background which much interfered with their *Bahasa Indonesia* as their formal language. This present study placed Javanese as mother tongue (L1) as the prominent sources of fossilization and interference of their English pronunciation.

The objective of this study was to describe the interference of phonological and orthographic system of Javanese (L1) on phonological fossilisation of EFL learners in Javanese contexts. It will be more interesting to discuss the phenomenon of the adult English learners, Javanese college students majoring English in Semarang municipality who come from different areas with different dialect in different accents. They speak Javanese as their mother tongue which is used in informal daily conversation or chatting among Javanese at home or at Javanese communities, while they used *Bahasa Indonesia* as the official language in classroom interaction, schools, offices, etc. English is placed as a foreign language which is a subject being taught at schools or other institutions. I assumed that the phonological and orthographic system of their mother tongue, Javanese was the main factor contributing on phonological fossilisation of EFL learners. Although they have knowledge of phonological

systems of the English language and have been learning it since they were in secondary school, they are used to pronounce some English words the way their mother tongue pronounced. Phonological fossilisation of Javanese learners was mostly found in the level of phrases or sentences in the spoken English. This study is highly significant since it focuses on phonological fossilisation phenomenon and the interference factors in Javanese context. The results of this study would help the Javanese learners and facilitate lecturers in predicting some troublesome areas of English pronunciation difficulties to enhance the communicative competence of EFL learners.

#### THE INTERFERENCE OF MOTHER TONGUE: A FACTOR INFLUENCING PHONOLOGICAL FOSSILISATION

Nowadays, issues of pronunciation errors already exist in the use of a FL as a target language they learn. In communication, non-native speakers often make mistakes or errors in pronouncing a word or a phrase in the target language. It happens because of some factors. One of them is the language interference of L1 on FL. The language interference can be understood as a process when one language has an impact on another language and when the individual is experiencing language transfer (Archvadze 2012). The interference happens because the learner uses his previous mother-tongue experience as a means of organizing the second language data (Littlewood, 2002). McCarthy (2001) specifies that when new languages are encountered, the existing representations of L1 are activated and reshape L2 incoming information. Moreover, Ellis (1994) states that language transfer is the incorporation of features of the L1 into the knowledge system of the L2 which the learner is trying to build.

The cognitive experiences of the L1 has a potential impact on the language acquisition process of the FL. Brown (2000) claims that the interference of the first language system with the second language system can be a barrier to second language acquisition. The problems or difficulties are possibly related to the absence of features that do not have equivalents in the native language. On the other hand, when the two languages have similar phonological features, the interference would assist the acquisition process (Ellis 1994).

When observing the language interference when teaching EFL to students who use Javanese as their native language (L1), a phonological interference is noticeable (Luo 2014). The basic problem why they make errors while using the FL is because the phonological system of L1 and FL is very different. Linguistic interference may also occur in any linguistic situation when L2 learner does not have a native-level command of a language (Archvadze 2012). Phonological interference in the spoken English performance of the Izon speaker in Nigeria were because of the level of immersion of the individual in Izon, the level of the individual's education, and the individual's oral English education exposure (Apeli & Ugwu 2013). Another interference factor is the dissimilarity of the orthographic system between L1 and FL. Berthold et al. (1997) states that orthographic interference is concerned with the spelling of one language altering another.

It is quite common to encounter in a learner's language features that strengthen some obstacles of the learner's command of the language. The phenomenon is most saliently manifested in phonological problems in the speech of English as a Foreign Language (EFL) learner after puberty. If the phonological errors are relatively permanent into a learner's foreign language competence, it can be considered as phonological fossilisation (Brown 2000). It refers to incorrect linguistic forms which have become a habit of speech in a second language learner (Graham 1981). Fossilisation is a mechanism that grounds every surface of linguistic materials where speakers will tend to keep producing their L1, no matter what the

learner's age is and how long does the speaker studies or speaks by using target language (FL). Selinker (1972) identifies that individual fossilisation consists of two aspects; error appearance and language competence fossilisation. Error appearance refers to interlanguage structures that are considered inappropriate and have been estimated to fix but it keeps appeared regularly. While the second aspect is language competence fossilisation. It refers to second language learners (L2) of phonology development, grammatical, lexical, and pragmatics competence. These can be found on L2 learners who have been learning the target language for a long time on a relatively high level. Selinker (1972) records that 95 percent of L2 learners are failed to reach the same pronunciation level as the real L1 speakers.

Phonological fossilisation occurs on adult learners on specific phonemes which are influenced by habit and mother tongue phoneme pattern pronunciation. At the segmental level, some pronunciation difficulties being faced by ESL learners are quite attributable to the phenomenon of negative transfer, where sounds of L1 are erroneously transferred into the target language (Brown 2014). English adult learners have phonological fossilisation in pronouncing expressions in the level of words, phrases, or sentences on the wrong way, where they always pronounce anything the way their mother tongue pronounces it. The first language's interference towards the currently learned language will be significant, especially on a adult learner. Fossilisation occurs on adult learners or it can be said the language brain development tends to freeze on adult learner's age. Lenneberg (1967) and Brown (2000) assert that after puberty, it is not easy to master pronunciation of L2 because a critical period in brain maturation has passed, and language development tends to freeze. Then he dubbed it as lateralization - the completion of cerebral dominance. Consequently, pronunciation error corrections for adult learners are more difficult than for young learners.

## METHODOLOGY

This research is part of a Research and Development (R&D) on Model of Teaching Materials of English Phonology for EFL Learners. This paper concerns with the interference on the phonological fossilisation of EFL learners in Javanese contexts. The total numbers of participants were 25 fourth-semester Javanese students of English Department who were selected from 5 universities in the Semarang municipality. The selected participants were Javanese native students. They have accomplished English Phonology course as one of the compulsory courses in the fourth semester. The research was done right after the fourth semester over. Accordingly, they were assumed having experiences in learning English for more than eight years since they were in secondary schools. The data were collected by means of pre-test and post-test, by recording their pronunciation of isolated words, their short speeches on certain topics in the form of guided interview, and their reading aloud on manipulated short text. These three different experiment settings were employed on the assumption that careful speech and spontaneous speech influenced the phonological production. Both pre-test and post-test were conducted in the same steps. First, asking them to read aloud on the listed single words (e.g. wear, tongue, and so on) which are predicted to be potential mispronouncing on vowels, diphthongs, and consonants; second, asking them to describe selected pictures, and to explain a thing or a certain concept, which guided them to produce expected words in speech; the last, asking them to read aloud on the manipulated paragraphs and short passages consisting the observed words. The treatment was conducted in a 100 minute-short course of 6 meetings. The course focused on introducing common mistakes of Javanese students in pronouncing English words and how to overcome the problems by giving exercises and practising the observed words in the level of single words,

phrases, sentences, and paragraphs. The theoretical aspects on phonology were not much introduced in this course since they had already got beforehand.

The data analysis focused on the words that were consistently produced in single words, short speeches, and in reading aloud. The contrastive analysis employed to compare the differences and similarities of phonemes between the two languages and to find out the interrelation of the phonemic inventories of these languages to identify the interferences of the L1 (Javanese) on FL (English) the respondents produced.

## FINDINGS AND DISCUSSION

Phonological fossilisations among Javanese students commonly occurred in short continuous speech and in reading aloud short passages rather than in isolated word. It was found that they had mispronounced for 5 vowels: /æ/, /ɪ/, /ə/, /ʌ/, and /i:/ in initial and middle position; 3 diphthongs: /əʊ/, /eɪ/, /aʊ/ in initial and middle position; and 10 consonants: /dʒ/, /tʃ/, /θ/, /ð/, /ʃ/, /v/, /ʒ/, /z/, /k/, and /t/ in the initial, middle and final position. It was also found that they tended to omit ‘/d/ and /t/ (past tense allophones)’ in final position, ‘double consonants in initial, mid and final position’, and /j/ after plosive bilabial’.

### FOSSILISATION ON VOWELS

The results of pre-test and post-test show that students mispronounced consistently on the five vowels in short speech and reading aloud test (see Table 1.). Mispronouncing on vowels typically happened by substituting phoneme /æ/ to [a] and /ɪ/ to [e] in initial and mid syllable position, and /ɪ/ to [i:], /ə/ to [a, e, u, ɔ:], /ʌ/ to [ɔ] (Perwitasari, Klamer & Schiller (2016)), and /i'æ/ to [ea] in mid syllable position.

TABLE 1. The Number of Students Mispronouncing on Vowels in Pre-test and Post-test

Mis-pronounce	Position	Words	Pronunciation		Realisation	Number of Students (%)					
			UK	US		Pre-test			Post-test		
						sw	ss	ra	sw	ss	ra)*
/æ/ to [a]	Initial	<abstraction>	[æb'stræk.ʃə n]	[æb'stræk.ʃə n]	[ab'strak.sən]	36	84	84	36	84	84
		<absent>	[ 'æb.s ə nt]	[ 'æb.s ə nt]	[ 'ab.sæn]	20	40	52	12	28	44
		<aspect>	[ 'æs.pekt]	[ 'æs.pekt]	[as.pæk]	60	88	92	36	80	88
	Mid	<associated>	[ə'səʊ.si.eɪ.tɪd]	[ə'səʊ.si.eɪ.tɪd]	[as.ɔ:.si:etəd]	52	92	92	32	88	92
		<systematic>	[.sɪs.tə'mæt.ɪk]	[.sɪs.tə'mæt.ɪk]	[sɪs.təma.ti:k]	40	64	64	32	64	64
/ɪ/ to [e]	Initial	<radical>	[ 'ræd.ɪ.kəl]	[ 'ræd.ɪ.kəl]	[ra.di:.kəl]	24	48	48	24	36	40
		<epistemological>	[ɪ.pɪs.tə'mɒl.ə.dʒɪkəl]	[ɪ.pɪs.tə'mɑ:.lə dʒɪkəl]	[ 'epɪ.sti:mɒlədʒi:kəl]	72	72	72	44	72	72
	Mid	<English>	[ 'ɪŋ.gəlɪʃ]	[ 'ɪŋ.gəlɪʃ]	[ 'eŋ.li:s]	32	60	60	24	40	40
		<recall>	[rɪ'kɔ:l]	[rɪ'kɔ:l]	[re'çəl]	20	48	48	12	44	44
		<reflection>	[rɪ'flek.ʃə n]	[rɪ'flek.ʃə n]	[re.flæk.sən]	32	40	40	20	40	32
/ɪ/ to [i:]	Mid	<empirical>	/ɪm'pɪr.ɪ.k ə l/	/ɪm'pɪr.ɪ.k ə l/	[ 'em.pi:.ri:kəl]	60	80	80	40	80	80
		<economic>	/i:.kə'nɒm.ɪk/	/ek.ə'nɒm.ɪk/	[ 'ek.ə.nɔ:.mi:k]	40	92	96	32	84	96
/ə/ to [a]	Mid	<additional>	/ə'dɪʃ. ə n. ə l/	/ə'dɪʃ. ə n. ə l/	[ 'e'di:s.ən. ə l]	20	12	20	12	12	12
		<machine>	/mə'ʃi:n/	/mə'ʃi:n/	[ma.si:n]	20	32	40	20	32	36
/ə/ to [e]	Mid	<unparalleled>	/ʌn'pær. ə l.eld/	/ʌn'per ə l.eld/	[an'par.əl.əl]	40	88	88	32	88	88
		<separate>	/'sep. ə r.ət/	/'sep ə r.ət/	[sə.pæ.ret]	56	72	72	56	72	72
/ə/ to [u]	Mid	<status>	/'steɪ.təs/	/'steɪ.təs/	[sə.tæ.tus]	44	72	84	28	72	84
		<orthographic>	/.ɔ:.θə θ 'græf.ɪk/	/.ɔ:r.θə 'græf.ɪk /	[ 'ɔ:r.t ə:'græf.i:k]	64	96	96	40	96	96
/ʌ/ to [ɔ]	Mid	<tongue>	/tʌŋ/	/tʌŋ/	[tɒŋ]	24	40	40	16	28	32
		<touch>	/tʌtʃ/	/tʌtʃ/	[tɒtʃ]	36	48	60	32	32	40
/i'æ/ to [ea]	Mid	<reality>	/ri'æl.ɪ.ti/	/ri'æ.l.ə.tj/	[reali:ti:]	44	84	84	32	84	84
		<reaction>	/ri'æk.ʃə n/	/ri'æk.ʃə n/	[re'ak.sən]	36	56	68	32	60	72

The higher percentage of the student's mispronouncing on those vowels was in short speech (64% in pre-test and 60% in post-test) and in reading aloud (67% in pre-test and 63% in post-test) rather than in single words (40% in pre-test and 29% in post-test). It means that,

cognitively, some students knew how to pronounce the vowels in the target language (TL); yet they pronounced them in different ways when the words were combined in sentences or in paragraphs. It means that they performed well in careful speech, but not in spontaneous speech.

T-test was employed to identify the development of student's competency on pronouncing English vowels by comparing statistically the different mean between pre-test and post-test (see Table 2). The p-values in single word (0.000), in short speech (0.006), and in reading aloud (0.007) were less than alpha (0.05). It shows that there was significant difference on pronouncing English words after the students had treatment. It was evidenced by some students succeeded to reach the same pronunciation level of the target language in single words, errors still kept appearing repeatedly in that of short speech or reading aloud. Moreover, it was also found that they had difficulties on pronouncing non-practical terms, like <epistemological> tended to be mispronounced to ['epi:sti:mɒlɒgi:kəl], <empirical> to ['em.pi:ri:kəl], or <orthographic> to ['ɔ:r.tə:'græf.i:k]. This mispronouncing of those vowels was considered as error appearance and phonology competence fossilisation (Selinker, 1972), since they had already been exposed to English words while learning English in their previous schools for more than eight years as well. Al Abdely's & Thai's study (2016) found that some English vowels were found to be more difficult to perceive compared to others.

TABLE 2. The Paired T-test of Pre-test and Post-test on Vowels

		Paired Differences					Sig. (2-tailed)
		Mean	Lower	Upper	t	Df	
Pair 1	Pre-& Post-test (Single Word)	10.364	6.665	14.062	5.828	21	.000
Pair 2	Pre-& Post-test (Short Speech)	4.182	1.313	7.051	3.031	21	.006
Pair 3	Pre-& Post-test (Reading Aloud)	4.000	1.209	6.791	2.981	21	.007

### FOSSILISATION ON DIPHTHONGS

Table 3 gives detail description on the number of Javanese students' mispronouncing on diphthongs /əʊ/, /eɪ/, /aʊ/ in initial or in middle position in English. In fact, similar to what happened on vowels, the students had cognitive competence in pronouncing diphthongs in single words but not in longer utterances. It could be seen on the mean of the percentage of the number of students who mispronounced the diphthongs. They mispronounced in single words (48 % in pre-test and 30% in post-test), in short speech (86% in pre-test and 78% in post-test); and in reading aloud (86% in pre-test and 79% in post-test).

TABLE 3. The Number of Students Mispronouncing on Diphthongs in Pre-test and Post-test

Mis-pronounce	Position	Words	Pronunciation		Realisation	Number of Students (%)					
			UK	US		Pre-test			Post-test		
/əʊ/ to [ɔ:]	Initial	<over>	[ 'əʊ.və r ]	[ 'oʊ.və ]	[ɔ:ver]	60	92	92	36	80	84
	Mid	<most>	[məʊst]	[moʊst]	[mɔ:s]	40	84	88	20	68	68
/eɪ/ to [e]	Mid	<transformation>	[,træns.fə'meɪ.fə n]	[,træns. fə meɪ.fə n]	[trans.fɔ:r.me.fən]	48	72	72	24	64	68
		<modification >	[,mɒd.ɪ.fi'keɪ.fə n]	[,mɑ:.di.fi'keɪ.fə n]	[mɔ:.di:.fi:.ke.fən]	44	84	84	36	72	72
/eɪ/ to [ai:]	Mid	<states>	[stertz]	[stertz]	[sətets]	60	88	88	40	76	80
		<remain>	[rɪ'meɪn]	[rɪ'mem]	[ri:.mai:n]	36	84	84	32	84	84
/aʊ/ to [ɔ]	Mid	<power>	[paʊə r]	[paʊə]	[pɔ.wər]	60	92	92	40	80	80
		<undoubtedly>	[ʌn'daʊ.tɪd.li]	[ʌn'daʊ. tɪd.li]	[an.dɒb.tɪd.li:]	40	92	92	20	92	92
		<paramount>	[ 'pær.ə.maʊnt]	[ 'per.ə.maʊnt]	[pa.ra.mɒn]	44	84	84	20	84	84

T-test (see Table 4) proved that the development of student's ability in pronouncing diphthongs was significant. The p-values in single word (0.000), in short speech (0.005), and in reading aloud (0.014) were less than alpha (0.05). Moreover, it also shows that the difference in mean and t-value of single words are greater than those of short speech and reading aloud. Again, cognitively, it happened the same way as fossilisation on vowels.

TABLE 4. The Paired T-test of Pre-test and Post-test on Diphthongs

Pair	Pre-& Post-test (Single Word)	Paired Differences					Sig. (2-tailed)
		Mean	CI <sub>95</sub>		t	df	
Pair 1	Pre-& Post-test (Single Word)	18.222	12.656	23.789	7.549	8	.000
Pair 2	Pre-& Post-test (Short Speech)	8.000	3.139	12.861	3.795	8	.005
Pair 3	Pre-& Post-test (Reading Aloud)	7.111	1.835	12.387	3.108	8	.014

### FOSSILISATION ON CONSONANTS

Table 5 shows how the number of the students mispronounced on consonants /dʒ/, /tʃ/, /θ/, /ð/, /ʃ/, /v/, /ʒ/, /z/, /k/, and /t/.

TABLE 5. The Number of Students Mispronouncing on Consonants in Pre-test and Post-test

Mis-pronounce	Position	Words	Pronunciation		Realisation	Number of Students (%)					
			UK	US		Pre-test		Post-test			
						sw	Ss	ra	sw	ss	ra)*
/dʒ/ to [ŋ]	final	<change>	[tʃeɪndʒ]	[tʃeɪndʒ]	[tʃeŋ]	60	92	92	40	52	60
/dʒ/ to [g]	mid	<technological>	[.tek.nə.'lədʒ.ɪ.k ə l]	[.tek.nə.'lə:.dʒɪ.k ə l]	[.tek.nə.'ləg.ɪ.kəl]	60	60	60	36	40	40
/dʒ/ to [j]	mid	<majority>	[mə'dʒɔɪ.rə.ti]	[mə'dʒɑ:.rə.ti]	[mə'jɔɪ.i.ti]	40	72	80	28	60	60
		<centuries>	['sen.tʃə.rɪz]	['sen.tʃə.rɪz]	['sen.tur.i:s]	84	76	84	36	76	76
/tʃ/ to [t]	Mid	<structure>	['strʌk.tʃə r]	['strʌk.tʃə]	['sətræk.tər]	36	40	48	28	20	20
		<eventual>	[r'ven.tʃu.əl]	[r'ven.tʃu.əl]	[e'ven.tu.əl]	40	80	80	20	40	40
/θ/ to [t]	initial	<three>	[θri:]	[θri:]	[tri:]	80	80	80	36	72	60
/ð/ to [nð]	initial	<the>	[ði:] or [ðə]	[ði:] or [ðə]	[nði:] or [nðə]	92	92	92	80	88	88
		<that>	[ðæt]	[ðæt]	[nðæt]	92	92	92	80	84	84
	initial	<she>	[ʃi:]	[ʃi:]	[si:]	60	80	72	20	60	60
/ʃ/ to [s]	mid	<influential>	[.ɪn.flu.'en.tʃəl]	[.ɪn.flu.'en.tʃəl]	[.ɪn.flu.'en.səl]	40	60	60	20	60	60
		<washed>	[wɒʃd]	[wɒʃd]	[wɒsəd]	60	72	68	24	72	60
	final	<wash>	[wɒʃ]	[wɒʃ]	[wɒs]	60	68	68	20	68	60
	initial	<very>	['veri]	['veri]	['fer.i]	92	92	80	60	72	72
/v/ to [f]		<view>	[vju:]	[vju:]	[fiu:]	88	88	80	60	76	76
	final	<five>	[faɪv]	[faɪv]	[faɪf]	80	84	84	40	68	60
		<live>	[lɪv]	[lɪv]	[lɪf]	72	80	80	40	68	60
/ʒ/ to [s]	mid	<pleasure>	['pleɪ.ər]	['pleɪ.ər]	['ples.ər]	44	68	68	20	68	68
/z/ to [s]	final	<series>	['sɪə.rɪ:z]	['sɪr.i:z]	['sə.rɪ:s]	60	96	96	40	96	96
	mid	<result>	[rɪ'zʌlt]	[rɪ'zʌlt]	[rɪ:'sʌlt]	80	88	88	60	88	88
/k/ to [s]	mid	<architecture>	['ɑ:.ki.tek.tʃə r]	['ɑ:.r.kɪ.tek.tʃə]	['ɑ:.r.sɪ.tek.tʃər]	52	60	60	20	40	32
/t/ to /g/	final	<thought>	[θɔ:t]	[θɑ:t]	[tɔg]	60	80	80	28	72	72
		<bought>	[bɔ:t]	[bɑ:t]	[bɔg]	60	80	80	28	68	68

Like what happened in pronouncing vowels and diphthongs, mostly the students had difficulties in pronouncing some consonants in longer utterances either in short speech or in reading aloud. It could be identified that more than 70% out of 25 students had fossilised on pronouncing /v/ such as in <very>, and <view>, /z/ in <series> and <result>, /t/ in <thought> or <bought>, and /tʃ/ in <centuries>. Also, the students remained consistent mispronouncing /ð/ becomes /d/ since they produced /n/ in front of sound /d/ such as /ðə/ became [ndə] and /ðæt/ became [ndæt] either in single words, short speech, or reading aloud.

By comparing pre-test and post-test, the development ability in pronouncing consonants among the students was significant. The mean differences and t-test of the number of the students mispronouncing consonants in single words were higher than those in short speech and reading aloud (see Table 6). Likewise, inconsistency still happened in short

speech or in reading aloud. It means that although they had cognitive competence in pronouncing those consonants, but they still unconsciously pronounced in different way in longer utterances. Such mispronouncing was considered as fossilisation.

TABLE 6. The Paired T-test of Pre-test and Post-test on Consonants

		Mean	Paired Differences		t	df	Sig. (2-tailed)
			Lower	Upper			
Pair 1	Pre-& Post-test (Single Word)	27.30435	22.47764	32.13106	11.732	22	.000
Pair 2	Pre-& Post-test (Short Speech)	11.82609	6.75679	16.89539	4.838	22	.000
Pair 3	Pre-& Post-test (Reading Aloud)	13.56522	8.65230	18.47814	5.726	22	.000

Similar problems were encountered by some students (more than 60%) who did double consonants' mispronouncing in mid and final position, like <higher> and <doubt> which tended to be pronounced [ˈhaɪ.gər] and [dʌb] by using the first consonant /g/ and omitting /h/ and using the first consonant /b/ and omitting /t/ as written in orthographic symbols. Some students also had difficulties in pronouncing double consonants in initial position, such as <sp..., st..., or sq...>. They tended to insert /ə/ in between voiceless alveolar fricative /s/ and voiceless stop /p/, /t/, and /k/ as in: <spiral> was pronounced [ˈsəpɪ.rəl] rather than /ˈspɪrəl.rəl/; <student> was pronounced [ˈsətuː.dənt] rather than /ˈstjuː.dənt/, and <squadron> was pronounced [ˈsəkʍəd.rən] rather than /ˈskwəd.rən/ (see Table 7). Such problems were also found by Yuliati (2014).

TABLE 7. The Number of Students Mispronouncing Double Consonants in Initial Position in Pre-test and Post-test

Inserting	Position	Words	Pronunciation		Realisation	Number of Students (%)					
			UK	US		Pre-test			Post-test		
						sw	ss	ra	sw	ss	ra)*
/ə/ in between /s/ and /p, t, k/	Initial	<spiral>	[ˈspɪrəl.rəl]	[ˈspɪr.əl]	[ˈsəpɪ.rəl]	75	80	85	65	75	80
		<speaker>	[ˈspiː.kər]	[ˈspiː.kə]	[ˈsəpiː.kər]	70	80	80	50	75	80
		<student>	[ˈstjuː.dənt]	[ˈstuː.dənt]	[ˈsətuː.dənt]	60	75	75	40	70	70
		<standard>	[ˈstæn.dəd]	[ˈstæn.dəd]	[ˈsætæn.dərd]	75	80	81	65	75	75
		<squadron>	[ˈskwəd.rən]	[ˈskwɑː.drən]	[ˈsəkʍəd.rən]	76	85	85	65	80	82
		<school>	[sku:l]	[sku:l]	[səku:l]	62	70	70	50	65	65

In the English language, sound /j/ occurs after plosive bilabial sound such as /p/ in the words <popular> and <population>, but it was mispronounced by omitting sound /j/ to be [ˈpɒp.u.lər] and [ˌpɒp.uːle.sən] and remain consistent in short speech and reading aloud as it is described in Table 8 below. It also happened in pronouncing phoneme /t/, /d/, or /θ/ in final position. Since Javanese does not have double consonants in final position, it was not surprised that the errors happened by omitting phoneme /t/, /d/, or /θ/, such in <networked>, <washed>, <test>, <end>, <charted>, <seventeenth> or <eighteenth>.

TABLE 8. The Number of Students Omitting /j/, /t/, /d/, and /θ/ in Pre-test and Post-test

Omitting	Position	Words	Pronunciation		Realisation	Number of Students (%)					
			UK	US		Pre-test			Post-test		
						sw	ss	ra	sw	ss	ra)*
/j/	mid	<popular>	[ˈpɒp.jʊ.lər]	[ˈpaː.pjə.lə]	[ˈpɒp.u.lər]	80	88	88	40	76	80
		<population>	[ˌpɒp.jʊˈleɪ.ʃən]	[ˌpaː.pjəˈleɪ.ʃən]	[ˌpɒp.uːle.sən]	80	88	88	40	76	80
		<networked>	[net.wɜːkd]	[net.wɜːkd]	[net.wɜːk]	84	84	84	40	60	52
/t/	final	<washed>	[wɒʃd]	[wɑːʃd]	[ˌwɒʃ]	80	96	96	40	60	52
		<test>	[test]	[test]	[tes]	76	96	96	32	72	56
		<end>	[end]	[end]	[en]	88	96	96	36	64	60
/d/		<charted>	[tʃɑːtɪd]	[tʃɑːrtɪd]	[ˈtʃɑːtər]	60	80	80	32	60	44
		<seventeenth>	[ˌsev.ənˈtiːnθ]	[ˌsev.ənˈtiːnθ]	[ˌsev.ənˈtiːn]	72	72	72	40	68	64
/θ/		<eighteenth>	[eɪˈtiːnθ]	[eɪˈtiːnθ]	[ˌegˈtiːn]	72	80	80	36	72	64



It can be concluded that the fossilisation on vowels, diphthongs, and consonants was significantly happened in longer utterances, either in short speech or in reading aloud. The calculations of the mean of paired-sample t-test by using of IBM SPSS statistics processors proved that the means differences and t-test of single words were higher than those of short speech and reading aloud. It means that if the students were exposed to intensively correct pronunciation, they pronounced English words close to the native speakers. However, the problems found when they pronounced English words in long utterances. They unintentionally produced a certain sound as the way of their first language. It could be considered as phonological fossilisation which was influenced much by the interference of L1.

#### INTERFERENCE ON PHONOLOGICAL FOSSILISATION

Phonological fossilisation was mostly influenced by L1. It may occur for some reasons, such as phonemic and phonetic dissimilarities of L1 and TL, or absence of features of L1 (Brown 2000, Andi-Pallawa 2013, Luo 2014, Yuliati 2014, Chaira 2015), the fusion of features of the L1 into the knowledge system of the TL (Ellis 1994, Chaira 2015), different consonant clusters of L1 and TL (Yuliati 2014), the cognitive experiences of the L1 (Brown 2000, Chaira 2015), the habit on mother tongue phoneme pattern pronunciation (Littlewood 2002, Chaira 2015), and the similarities of the orthographic systems of L1 and TL (Chaira 2015).

Moreover, the interferences on phonological fossilisation of Javanese EFL learners could be classified into phonological system and orthographic system.

#### PHONOLOGICAL SYSTEM

The interferences of phonological system mostly occurred in some vowels (see Table 1) and consonants (see Table 5, 7, and 8). The interferences on vowels and consonants were much influenced by the phonemic and phonetic dissimilarities between L1 and TL, and the absence of phonemic features that do not have equivalents in the TL. Like what has been found in *Bahasa Indonesia*, the typical sound systems that has different phonemic features in Javanese and English were occurred in /v/, /θ/, /ð/ which do not exist in all positions, as well as /f/, /v/, /ʃ/, /dʒ/, /θ/, /ð/ in the final positions of the word of Javanese. Different phonetic features occurred in /p, t, k/ which are never aspirated. Sound /r/ is never weak articulated in Javanese. Different variation of phoneme /ɑ:/ vs. /ʌ/, /æ/ vs. /e/, /ɪ/ vs. /i:/, /ɒ/ vs. /ɔ:/, /ʊ/ vs. /u:/, /ʃ/, /z/, /s/, /ʒ/, /ʒ/, /dʒ/ and the group of sounds that do not exist in Javanese sound system are: / æ, ʌ, v, θ, ð / (Andi-Pallawa 2013).

The interferences of phonological system were found in adding the alveolar nasal /n/ to the initial voiced alveolar plosive consonant /d/ in <the> [ndə], and <then> [nden]. It was because of Javanese habits of adding /n/ or pre-nasalized consonant of /d/ for ‘demok’ [ndəmək], or ‘delok’ [ndələk].

TABLE 9. The interference of alveolar nasal /n/ to initial voiced alveolar plosive consonant /ð/

L1	FL	Output
‘delok’ [ndələk] <watch>	<the> [ðə]	[ndə]
‘deso’ [ndesɔ] <villager>	<then> [ðen]	[nden]
‘damel’ [ndaməl] <make>	<that> [ðæt]	[ndæt]
‘demek’ [ndəmək] <touch>	<than> [ðen]	[nden]

Since the errors occurred at the initial voiced alveolar plosive consonant that refers to sound /d/ only, then the sound /θ/ is not included, e.g. <theme> and <theory>. Even though they appear in the initial but Javanese students do not begin these words with preceding /n/.

Inserting /ə/ in between voiceless alveolar fricative /s/ and voiceless stop /p/, /t/, and /k/ in <spiral> ['səpɪrəl] vs /'spaiə.rəl/, <student> ['sətju:.dənt] vs /'stju:.dənt/, and <squadron> ['səkwɒd.rən] vs /'skwɒd.rən/ as in Javanese 'sepeda' [səpeda], 'setengah' [sətəŋah], and 'sekuali' [səkuali] (Yuliati 2014, p. 513).

TABLE 10. The interference of /e/ in between voiceless alveolar fricative /s/ and voiceless stop /p/, /t/, and /k/

L1	FL	Output
'Sebelah' [səbələh] <beside>	<Structure> /'strʌk.tʃə r /	['sə.trak.tʃə r ]
'Spidol' [səpidɔl] <marker>	<Student> /'stju:.dənt/	['sə.tu:.dən]

Consider that these phonemes /s/ and /t/ need much effort to pronounce since they are voiceless alveolar fricative /s/ and voiceless stop /t/ respectively. Moreover, Javanese tends to make the words easier to pronounce such as 'sakwat' [sa?.wat] (at once) and 'syawal' [sia.wal] (kind of Javanese month).

Omitting phoneme /j/ in <popular> ['pɒp.jə.lə] vs ['pɒp.jʊ.lə] and <population> [pɒp.jə.'leɪ.f(ə)n] vs [pɒp.jʊ.'leɪ.f(ə)n] and allophone past tense /t/ and /d/ in <washed> [,wɒʃ] vs [,wɒʃt ], or in <end> [ɛn] vs [ɛnd]. See table 11 below.

TABLE 11. The interference of phoneme /j/, allophone past tense /t/, /d/, and /id/ or double consonant

L1	FL	Output
Purun [purun] <want>	<Popular> ['pɒpjʊlə]	['pɒ.pʊ.lə]
Ngapusi [ŋapusi] <lie>	<Population> [pɒpjʊ.'leɪf(ə)n]	[pɒ.pʊ.'leɪ.f(ə)n]
Absent in Javanese	<Paralleled> [pær.ə.leɪd]	[pær.ə.leɪ/]
Absent in Javanese	<Washed> [wɒʃt]	[wɒʃ] [wɒʃəd]
Absent in Javanese	<End> [ɛnd]	[ɛn]
Absent in Javanese	<Test> [tɛst]	[tes]

#### ORTHOGRAPHIC SYSTEM

The data on Table 1 and Table 3 (on previous page) also shows how Javanese students' mispronounced vowels and diphthongs based on their orthographic systems. They tended to pronounce vowels as the phoneme appeared in alphabetical system, for example, <abstraction> was pronounced [ab'strak.sən] instead of /æb'stræk.ʃən/; <absent> was ['ab.sən] instead of /'æb.sənt/; <status> was pronounced [sətə.tus] instead of /'steɪ.təs/; or <orthographic> to ['ɔ:r.t ɔ:'græf.i:k] instead of /,ɔ:θə'græf.ɪk/. It also happened in pronouncing diphthongs, such as <over> becoming [ɔ:vər] instead of /'əv.vəʔ/, or <most> to [mɔ:s] instead of /məʊst/. In consonants, the students overgeneralised to pronounce /r/ in all positions. This tendency was interfered by the habit on mother tongue phoneme pattern pronunciation, such as *elek* 'ugly' [e.lek]; *emak* 'mother' [ə.mak], *kui* 'this' [ku.i], *kae* 'that' [ka.e], *nggonmu* 'yours' [ŋgon.mu], and *mangan* 'eat' [ma.ŋan]. This interference could be considered sturdy because of the cognitive experiences of the L1 (Brown 2000, Chaira 2015), and the similarities of the orthographic systems of L1 and TL (Chaira 2015). Their cognitive experiences were possibly influenced by the language acquisition process of the TL. In the learning process, they were introduced to orthographic symbols in advance rather than phonological symbols. In regular communication, they were extensively exposed to borrowing words of TL which are commonly used among Javanese in spoken and written texts, such as *setatus* from <status>, *absen* from <absent>, *abstraksi* from <abstraction>, or *radikal* from <radical>, *transformasi* from <transformation>, or *power* from <power>. Those borrowed words are pronounced as the way they pronounce their mother tongue.

## CONCLUSION AND RECOMMENDATION

The fossilisation employed by the EFL learners of Javanese context was in the area of vowels, diphthongs, and consonants which occurred mostly in longer utterances such as short speech and reading aloud rather than in isolated words. They produced the English sounds as in the way of their first language, for instance: <tongue> tends to be pronounced [tɔŋ], <school> is pronounced [se.ku:l], and failure in pronouncing /v/ <very> as in the way of the sound /f/. This is because they are influenced by the interference of their mother tongue.

The interferences on phonological fossilisation happened in phonological system and orthographic system. In phonological system, the different phonemic features in Javanese and English was mostly the biggest problems for the participants, such as /v/, /θ/, /ð/ as well /f/, /v/, /tʃ/, /dʒ/, /θ/, /ð/ since their existence is infrequent whether in final or all positions of Javanese. Moreover, Javanese /r/ is lingual rolled consonant since it is never weak. The variety of English phoneme is also a matter for the participants. Furthermore, they liked to add alveolar nasal /n/ to initial voiced alveolar plosive consonant /d/ in <the> [ndə], and <then> [nden]. It happened because of the Javanese habit of adding /n/ for ‘demok’ [ndə.mək], or ‘delok’ [ndə.lək]. They inserted /ə/ in between voiceless alveolar fricative /s/ and voiceless plosive /p,t,k/ such as in <student> [ˈsətju:.dən]. They omitted phoneme /j/ in <popular> [ˈpɒp.ʊ.lə] and <population> [pɒp.ʊ.ˈleɪ.ʃ(ə)n]. It happened as well as on allophone past tense /t/ and /d/ in <washed> [wɒʃ] or in <end> [ɛn]. In addition, the absence of consonant at the end of the word was kind of a habit for EFL learners, such as <test> becomes [tes].

Orthographic system influenced their interferences on phonological fossilisation because of the cognitive experience of L1 and the orthographic similarities of L1 and TL, for example <most> to [mɔ:s] instead of /mɔ:st/ since it was the way of the Javanese language, such as *elek* ‘ugly’ [e.lek]; *emak* ‘mother’ [ə.mak], *kui* ‘this’ [ku.i], *kae* ‘that’ [ka.e], *nggonmu* ‘yours’ [ŋgon.mu]. They were mostly concerned with the orthographic symbols rather than the phonetic ones as well as when they pronounced *setatus* from <status>, *absen* from <absent>, *abstraksi* from <abstraction>, or *radikal* from <radical>, *transformasi* from <transformation>, or *power* from <power>.

The phonological fossilisation issue needs to be seriously considered since it remains prominently occurring even in today’s language learning which influences their English-speaking fluency. It is deeply hoped that the findings of this study can be the reference in making excellent learning materials in consideration of making Javanese students have better pronunciation. The results of this study may also provide some useful insights into syllabus design and English Language Teaching (ELT).

## ACKNOWLEDGEMENT

This study was supported by The Ministries of Research, Technology, and Higher Education of the Republic of Indonesia.

## ENDNOTES

sw= single word; ss= short speech; ra= reading aloud

REFERENCES

- Al Abdely, A. A. W. & Thai, Y. N. (2016). Learning English Vowels by Iraqi EFL Learners: Perceived Difficulty versus Actual Performance. *3L: The Southeast Asian Journal of English Language Studies*. 22(1), 1-18.
- Andi-Pallawa, Baso (2013). A Comparative Analysis between English and Indonesian Phonological Systems. *International Journal of English Language Education*. 1(3).
- Apeli, C. U. & E. N. Ugwu. (2013). Phonological Interference in the Spoken English Performance of the Izon Speaker in Nigeria: A Product of Systemic and Interlanguage Factors. *AFRREV LALIGENS: An International Journal of Language, Literature and Gender Studies*. 2(2), Serial No 6, 173-189.
- Archvadze, E. (2012). The Problems of First Language Interference in the Process of Teaching Second Languages. *English Education Journal (EEJ)*. 6(4), 469-483.
- Berthold, M., Mangubhai, F. & Batorowicz, K. (1997). *Bilingualism & Multiculturalism: Study Book*. Distance Education Centre, University of Southern Queensland.
- Brown, H. Douglas. (2000). *Principles of Language Learning and Teaching*, 4th ed. New York: Pearson Education.
- Brown, H. Douglas (2014). *Principles of Language Learning and Teaching*, 6th ed. New York: Pearson Education, ch. 9, pp. 242-276.
- Celce-Murcia, M. (2007). Rethinking the Role of Communicative Competence in Language Teaching. E. Alcón Soler and M.P. Safont Jordà (Eds.), *Intercultural Language Use and Language Learning* (pp. 41–57). Springer.
- Chaira, S. (2015). Interference of First Language in Pronunciation of English Segmental Sounds. *English Education Journal (EEJ)*. 6(4), 469-483.
- Ellis, R. (1994). *The Study of Second Language Acquisition*. Oxford, England: Oxford University Press.
- Graham, J. G. (1981). Overcoming Fossilized English. (Report N. FL 012 632). University of Maryland Baltimore County, *MI: Teachers of English to Speakers of Other Languages Convention*. (Document Reproduction Service ERIC N. ED 209 924).
- Kirkpatrick, Andy. (2010). *English as a Lingua Franca in ASEAN: A Multilingual Model*. Hong Kong University Press.
- Lenneberg, E. (1967). *Biological Foundations of Language*. New York: Wiley.
- Littlewood, W. (1984). *Foreign and Second Language Learning*. Cambridge: Cambridge University Press.
- Littlewood, W. (2002). *Foreign and Second Language Learning*. Beijing. Foreign Language Teaching and Research Press and the Press of the University of Cambridge, Cambridge.
- Luo, Jianping (2014). A Study of Mother Tongue Interference in Pronunciation of College English Learning in China. *Theory and Practice in Language Studies*. 4(8), 1702-1706, doi:10.4304/tpls.4.8.1702-1706.
- McCarthy, M. (2001). *Issues in Applied Linguistics*. Cambridge, England: Cambridge University Press.
- Nani I., Tiono. & Arlene Maria Y. (2008). A study of English Phonological Errors Produced by English Department Students. *k@ta*. 10(1), 79-112.
- Perwitasari, A., Klamer, M. & Schiller, N. (2016). Formant Frequencies and Vowel space are in Javanese and Sundanese English Language Learners. *3L: The Southeast Asian Journal of English Language Studies*. 22(3), 141-152.
- Selinker, L. (1972). Interlanguage. *International Review of Applied Linguistics*. 10, 209-231.
- Yuliati, Y. (2014). Final Consonant Clusters Simplification by Indonesian Learners of English and Its Intelligibility in International Context. *International Journal of Social Science and Humanity*. 4(6), 513-517. doi:10.7763/IJSSH.2014.V4.409.