ARTICLES

Phonetic and phonological challenges in the acquisition of Arabic consonants: Evidence from English-speaking learners of Arabic as a foreign language

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Abstract. This study aimed to explore the challenges encountered by non-native learners of Arabic in the area of consonants articulation. The participants of the study were seven female learners of Arabic as a Foreign Language. They were asked to read a list of Arabic words containing the expected difficult sounds. The results of the study revealed that the impact of learners' L1 is not the only factor responsible for committing errors in the articulation of Arabic consonants; exposure to informal forms of language use played a significant role as the participants of this study were mainly exposed to the local dialect rather than the standard through daily communication with Arabic native speakers in real-life situations. The results of the study also showed that the articulatory nature of some Arabic consonants was a challenge for AFL learners. The findings of the study have direct implications for language pedagogy, especially in designing instructional approaches that could help AFL learners overcome difficulties with unfamiliar Arabic consonants.

Keywords: *error analysis, phonological errors, English-speaking learners, Arabic foreign language, Arabic consonants, L1 interference*.

Аль-Шалабі Фатіма. Фонетичні та фонологічні труднощі в освоєнні арабських приголосних: Дані, отримані від англомовних студентів, які вивчаı арабську мову як іноземну.

Анотація. Метою цього дослідження було вивчення труднощів, з якими стı ються особи, для яких арабська мова не є рідною, у сфері артикуляції приголосних. Учасницями дослідження стали сім жінок, які вивчають арабську як іноземну мову (AFL). Їм було запропоновано прочитати список арабських слів, що містили звуки, які, як очікувалося, могли викликати труднощі. Результати дослідження показали, що вплив рідної мови (L1) учнів не є єдиним чинником, що зумовлює помилки у вимові арабських

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приголосних; значну роль відігравало знайомство з неформальними формами мовного вжитку, оскільки учасниці цього дослідження в повсякденному спілкуванні з носіями арабської мови в реальних життєвих ситуаціях переважно стикалися з місцевим діалектом, а не з літературною мовою. Результати дослідження також показали, що артикуляційні особливості деяких арабських приголосних становили складність для тих, хто вивчає арабську як іноземну мову. Висновки дослідження мають безпосереднє значення для педагогіки мовного навчання, особливо при розробці навчальних підходів, які могли б допомогти тим, хто вивчає арабську як іноземну мову, подолати труднощі з незнайомими арабськими приголосними.

Ключові слова: *аналіз помилок, фонологічні помилки, студенти, що розмовляють англійською, арабська як іноземна мова, арабські приголосні, інтерференція рідної мови.*

Introduction

Acquisition of a Foreign Language

While a first language (L1) is acquired naturally through exposure to the language spoken by one's parents, family members or friends, a second or foreign language (L2) is often acquired for certain purposes whether travelling, living or studying abroad, getting a better job or integrating into a particular community, inter alia. Arabic as a foreign language (AFL) is no exception.

Adults need to learn a whole new way of speaking when learning a new language (Malkawi & Al-Saidat, 2025). However, this is not as easy as it appears; learners of a foreign language may encounter certain challenges in learning some L2 features which, in turn, may hinder or at least decrease their gains. In this regard, Al-Saidat et al. (2024) state that pronunciation is one of the hardest areas in learning an L2. They normally have a hard time learning to speak a second language, especially when the phonological systems of their L1 and L2 are very different (Al-Saidat et al., 2023). They find it difficult to learn sounds that do not exist in their L1 (Strange & Shafer, 2008; Shehata, 2004). Relatedly, Flege and Bohn's (2021) Revised Speech Learning Model (SLM-r) affirms that L2 learners repeatedly incorporate the phonetic features of their L1 with those of L2. Similarly, Flege et al. (2021) confirmed that "individuals who are exposed to an L2 map the sounds they hear in L2 words onto native language (L1) phonetic categories" (p. 85). They perceive and produce non-native sounds under the influence of their L1's phonological system (Al-Shalabi, 2021; Al Mahmoud, 2013). This may challenge them in acquiring new phonetic categories. As a result, L1 phonological interference, articulatory confusions, and unstable pronunciations are likely to emerge, particularly for sounds that lack equivalents in L1 (Flege & Bohn, 2021).

The Arabic Language and Arabic Phonemes

Arabic is a Semitic language; it is derived from the Afro-Asiatic language family (Albirini, 2016; Al-Huri, 2015). It is spoken as a native language by more than 300 million speakers (Bassiouney, 2009). According to WorldData (2025), Arabic is used as an L2 by over 400 million people most of whom are non-Arab Muslims with good reading abilities but poor speaking fluency (Albirini, 2016). It is the or one of the official languages of twenty-three countries (Albirini, 2016; Bassiouney, 2009). Arabic is the fifth most widely spoken languages worldwide and one of the six languages of the United Nations (Al-Huri, 2015). Non-Arabs learn Arabic for several reasons, such as academic purposes, understanding Arabic culture, getting a job, and for religious purposes (Abu-Irmies, 2014). However, the term 'Arabic' refers to two main varieties, namely, Modern Standard Arabic (MSA) and Colloquial Arabic (CA) (Benmamoun & Bassiouney, 2017; Kamusella, 2017). The former is the official language of all Arabic-speaking countries; it is used in all formal situations such as education, religious events, print and most mass media (Al-khudidi, 2024). While MSA is the norm for all formal written and spoken communication, CA is the norm for all informal communication. It differs from one Arab country to another and even from one region to another within the same country (Al-Saidat & Al-Momani, 2010). Moreover, Arabic is considered a diglossic language where two varieties (MSA and CA) are used side-by-side for different social functions (Ferguson, 1959). In the current study, the term 'Arabic' is used to refer to MSA because it is the variety that non-native speakers learn in different institutions not only in Saudi Arabia but also in other Arab countries.

The phonemic inventory of Arabic shows that it has 28 consonants and 8 vowels. Being the focus of this study, Arabic consonants are shown in table 1 with their places and manners of articulation and whether voiced or voiceless.

For the sake of a quick comparison between the consonants of both Arabic and English, the English consonant chart is presented below in Table 2.

Based on the researcher's experience and observations, many learners of AFL do not pronounce Arabic consonants correctly despite completing a number of courses in learning Arabic whether in Saudi Arabia or elsewhere. Therefore, this study is expected to contribute to teaching and learning Arabic consonants, enhancing the acquisition of AFL by non-native speakers.

This study aims to identify the problematic consonants for AFL learners and investigate the reasons behind these difficulties and, consequently, propose pedagogical strategies. To achieve these objectives, the study posits the following research questions.

RQ1: What are the most difficult consonants for learners of Arabic as a foreign language?

RQ2: What is the cause(s) of these difficulties?
RQ3: What are the possible solutions to overcome these difficulties?

Table 1
Consonant Inventory of Arabic (adopted from Al-Ani, 1970 and Amayreh et al., 1999 with modification)

		Manner of articulation											
		Stop		Affricate		Nasal		Fricative		Trill		Approximant	
		vl	vd	vl	vd	vl	vd	vl	vd	vl	vd	vl	vd
Place of articulation	Bilabial		b				m						w
	Labiodental							f					
	Interdental							θ	ð ż				
	Alveodental	t ṭ	d đ										
	Alveolar						n	s ṣ	z		r		l
	Postalveolar				dʒ			ʃ					
	Palatal												j
	Velar	k						χ	ɣ				
	Uvular	q											
	Pharyngeal							ħ	ʕ				
	Glottal	ʔ						h					

Note. vl=voiceless, vd=voiced

Table 2
Consonant Inventory of English (adopted from Roach 1991, p. 62)

		Manner of articulation								
		Plosive		Fricative		Affricate		Nasal	Lateral	Approximant
		vl	vd	vl	vd	vl	vd			
Place of articulation	Bilabial	p	b					m		w
	Labiodental			f	v					
	Dental			θ	ð					
	Alveolar	t	d	s	z			n	l	
	Palate-alveolar (Post-alveolar)			ʃ	ʒ	tʃ	dʒ			r
	Palatal									j
	Velar	k	g					ŋ		
	Glottal			h						

Note. vl=voiceless, vd=voiced

Literature Review

The literature shows that the acquisition of Arabic consonants by non-native speakers has attracted the attention of researchers. Studies have revealed that certain Arabic consonants pose for AFL learners significant challenges (e.g., Aldamen & Al-Deaibes, 2023; El Haimeur, 2025; Shehata, 2015 ; Binasfour et al., 2017; Al Mahmoud, 2013; Huthaily, 2008).

For example, El Haimeur (2025) studied the acquisition of Arabic consonants by English-speaking AFL learners with a focus on the emphatic and pharyngeal consonants. Employing a mixed-methods approach, the author collected data from the participants through perception tasks, recordings, and written assignments. The results of the study revealed that the participants substituted Arabic emphatic and pharyngeal consonants by similar English sounds, constituting a challenge in the perception and production of these consonants. The results also showed that integrating VoiceThread and recorded instructional videos enhanced learners' acquisition of the emphatic stop /đ/ which was the only sound that was correctly perceived and produced by the participants. Substituting L2 unfamiliar sounds by L1 sounds has been reported by a study conducted by Huthaily (2008) whose results revealed that the participants often substituted L2 sounds that do not exist in their L1 by their English equivalents.

Similarly, Aldamen and Al-Deaibes (2023) investigated the perception and production of Arabic consonants by 19 English-speaking learners of Arabic as a foreign language. The study focused on the emphatic consonants. Using pre and post-tests, the results of the study revealed that Arabic non-emphatic consonants were perceived and produced in line with their English counterparts, whereas the Arabic emphatic consonants were not aligned to any category in English. The emphatic consonants constituted a major difficulty for learners of AFL. Moreover, the participants of Shehata (2015) reported difficulties in the perception of certain Arabic consonants including the emphatic ones as they were unsuccessful in differentiating the emphatic consonants from the non-emphatic ones. The author attributed the challenges to the fact that these sounds are absent from the English sound system, the participants' first language. Furthermore, the results of Binasfour et al.'s (2017) study showed that learners of Arabic found it challenging to perceive and produce Arabic emphatic consonants /ṣ/, /ż/, /đ/, and /ṭ/. they attributed the difficulty to the similarities between the emphatic consonants and their non-emphatic counterparts /s/, /ð/, /d/, and /t/. Similarly, Al Mahmoud (2013) reported that English-speaking learners of Arabic found various difficulties in acquiring Arabic consonants; the study showed that the voiceless pharyngeal /ħ/ was the most difficult and challenging Arabic sound for them.

Methods

Participants

This study was conducted in Al Jubail Industrial City in Saudi Arabia. The participants were seven AFL learners who have completed some basic courses at home before coming to Saudi Arabia. All the participants are females; they accompanied their husbands who came to work at Al Jubail Industrial City. Along with other learners, they joined the researcher for private lessons in learning Arabic conversation that lasted for about three months during 2025. They are native speakers of English. The researcher intentionally selected participants with the same first language (L1) in an attempt to explore whether L1 has any influence on learning Arabic consonants. English, as an L1, was particularly preferred as the researcher is an expert in teaching English to non-native speakers at a university level, thus familiar with English phonemes. Prior to recording sessions, the participants were introduced to the aims of the study and were assured that their participation was totally voluntary and that they can withdraw at any time. After each participant signed a consent form, the recording started.

Data Collection and Analysis

The study employed a descriptive qualitative approach with analytical elements. It is qualitative in nature in that the researcher relied on gathering and interpreting oral data. It employed a descriptive approach to document the participants' pronunciation of Arabic consonants and the type of deviation that occurred. Consecutively, an analytic approach was introduced to infer the sources of these deviations, drawing on Selinker's (1972) Interlanguage Theory and Eckman's (1977) Markedness Differential Hypothesis to explain the influence of the English phonological system on learning Arabic consonants. The study mainly focused on the acquisition of consonants in terms of their types and sources of difficulties. It intended to describe naturally occurring pronunciation patterns and analyse them through phonological and language acquisition theories. Through this approach, it aimed to identify and investigate the difficulties encountered by non-native learners while learning Arabic sounds. The findings are expected to offer some pedagogical insights into improving the teaching as well as learning pronunciation of Arabic consonants in the AFL context.

For data collection, the researcher prepared a list of 30 Arabic words representing the Arabic consonants predicted by the researcher to be most

difficult for English learners of Arabic. Each Arabic consonant appears at least once in word-initial, medial, and final position. The data were recorded and then transcribed using IPA symbols, see Table 1. To identify errors, the researcher relied on her experience as a native speaker of Arabic and consulted two experts to validate the pronunciation of individual words contained in the list. Similarly, the transcription of the recorded material was validated by an expert in the field.

Results

The analysis of the recorded data revealed that AFL learners encountered most challenges in articulating certain stop and fricative sounds. The stops category includes two alveo-dentals (/ṭ/ and /đ/), the uvular /q/, and the glottal /ʔ/, whereas the fricatives category includes one interdental /ż/, two velars /χ/ and /ɣ/ and two pharyngeals /ħ/ and /ʕ/.

Challenges with Stops

1. /ṭ/ → /t/ and /đ/ → /d/
The emphatic stops /ṭ/ and /đ/ are substituted by their non-emphatic counterparts /t/ and /d/, respectively. For example, /ṭa:lıb/ → /ta:lıb/ 'student', /baṭal/ → /batal/ 'hero', /ʔarđ/ → /ʔard/ 'land' and /đırs/ → /dırs/ 'tooth' In this substitution process, the place and manner of articulation and the voicing of the emphatic sounds are retained. This substitution took place because of the similarity between the emphatic and their non-emphatic counterparts of these sounds since the difference is found only in raising the back of the tongue in the articulation of the former group. This erroneous production can be summarised as emphatic → non-emphatic. The term 'de-emphaticisation' will be used to describe this process. Additionally, these two sounds do not exist in the inventory of English phonemes. Moreover, the sound /đ/ is not found in most of the Arabic dialects including the Gulf dialects; it is usually replaced by /ż/ (Watson, 2007) as in /đarabahu/ → /żarabu/ 'he hit him', /d/ as in /đarabahu/ → /darabu/ 'he hit him', or /ð/ as in /ʔıđrıb/ → /ʔıðrıb/ 'you (sing. m.) hit'. In the Saudi dialect to which the participants are exposed, it is pronounced as /ż/.
2. /q/ → /k/
The uvular voiceless stop /q/ is replaced by the velar voiceless stop /k/, thus /q/ → /k/ as in /ʃarq/ → /ʃark/ 'east' and /qalb/ → /kalb/ 'heart'. It is worth mentioning here that when a phoneme is replaced by another, the meaning may be affected; in /qalb/ → /kalb/ 'heart, the mistaken pronunciation /kalb/

may be interpreted differently as 'dog' unless signaled by the context. This shows how the incorrect pronunciation of certain sounds may lead to ambiguity and misinterpretation of certain words. The difficulty in the pronunciation of this sound can be attributed to at least three reasons. First, the articulation of uvular sounds is slightly difficult as it involves moving the back of the tongue towards the uvula, especially for learners who are unfamiliar with this articulation. This is also evident in the Arabic dialects used in the majority of Arabic-speaking communities. For example, in the Saudi and Jordanian dialects, it is substituted by /g/ as in /gadɪ:m/ for /qadɪ:m/ 'old', whereas in the Egyptian dialect, Syrian, and Lebanese dialects, /q/ is pronounced as /ʔ/ as in /qalb/ → /ʔalb/ 'heart'. Moreover, similar with the incorrect pronunciation of the participants of this study, in certain Palestinian rural dialects, /q/ is substituted by /k/ as in the pronunciation of /qɪṭʕah/ as /kaṭʕa/ 'piece (of something)'. Second, English has no uvular sounds which poses a challenge for learners of Arabic with English as an L1. Third, learners of Arabic in Saudi Arabia are mostly exposed to the local dialects during their interactions with the local community where this sound is not used at all; it is always replaced by the local dialect sound /g/. The choice of /k/ as a substitute for /q/ seems to be due to the fact that both sounds share the voicing and manner of articulation aspects in addition to being neighbours in terms of the place of articulation: /q/ is uvular and /k/ is velar.

3. /ʔ/ → ∅

In many Arabic dialects, the glottal stop is omitted, and the preceding short vowel is lengthened to its long counterpart. For example, /faʔr/ → /fa:r/ 'mouse', /faʔs/ → /fa:s/, 'axe' and /biʔr/ → /bi:r/ 'water well'. Similarly, about half of the participants of this study omitted this glottal stop, especially when it occurs medially or finally as in /raʔs/ → /ra:s/, 'head' and /ðiʔb/ → /ði:b/ 'wolf'. The glottal stop is not an English phoneme, but found as an allophone of /p/, /t/ and /k/ in certain contexts, especially in RP English. For example, /ɒptɪk/ → [ɒʔptɪk] 'optic' and /bɒksə/ → [bɒʔksə] 'boxer' (Roach, 1991, p. 112). This explains why it is not a major difficulty for English learners of Arabic.

Challenges with Fricatives

1. /ż/ → /ð/

The voiced interdental emphatic fricative /ż/ becomes non-emphatic /ð/ by the majority of the participants. For example, /ʕażm/ → /ʕaðm/ 'bone' and /ɣalɪ:ż/ → /ɣalɪ:ð/ 'thick'. This is similar to the de-emphaticisation process observed in the articulation of the emphatic stops /ṭ/ and /đ/, discussed above. This sound seems to be little problematic. In some Arabic dialects, it is also changed into a

voiced alveo-dental fricative sound /z/ but retaining its emphasis such as the pronunciation of /żulm/ as /zulm/ 'injustice' or /zuru:f/ for /żuru:f/ 'circumstances'. However, no changes in the articulation of /ż/ were observed in Saudi dialects. Thus, the cause of this difficulty can be attributed to the absence of this sound from English sound system.

2. /χ/ → /k/ and /ɣ/ → /g/

The voiceless velar fricative /χ/ is substituted by the voiceless velar stop /k/ as in /χawf/ → /kawf/ 'fear', /ʔuχt/ → /ʔukt/ 'sister' and /ʔaχ/ → /ʔak/ 'brother'. Sharing the voicing and the place of articulation, makes it predictable to find /k/ for /χ/. Similarly, the voiced velar fricative /ɣ/ becomes voiced velar stop /g/ as in /maɣṣ/ → /magṣ/ 'colic'and /mablaɣ/ → /mablag/ 'amount'. Since these two sounds exist in most of Arabic dialects including Saudi dialects, the source of this challenge comes from the phonological system of the participants' first language, English, where /χ/ and /ɣ/ are not found.

3. /ħ/ → /h/ and /ʕ/ → ∅

The voiceless pharyngeal fricative /ħ/ changes into a voiceless glottal fricative /h/ as in /ħarb/ → /harb/ 'war', /baħr/ → /bahr/ 'sea' and /mılħ/ → /mılh/ 'salt', whereas the voiced pharyngeal fricative /ʕ/ is dropped as in /ʕulu:m/ → /ulu:m/ 'sciences' and /muʕallım/ → /muallım/ 'teacher'. This can be attributed to the fact that pharyngeal sounds do not exist in English, so participants are not familiar with the pharyngeal articulation; they replace pharyngeal sounds with closest substitutes. Table 3 summarises the results of the analysis in terms of the patterns that the learners followed in producing the difficult or unfamiliar Arabic articulations.

Table 3
Summary of the Results

Error	**Example**	**Pattern**
/ṭ/ → /t/	/ṭa:lıb/ → /ta:lıb/ 'student'	De-emphaticisation
/đ/ → /d/	/ʔarđ/ → /ʔard/ 'land'	
/ż/ → /ð/	/ʕażm/ → /ʕaðm/ 'bone'	
/q/ → /k/	/ʃarq/ → /ʃark/ 'east'	Place of articulation shift
/ħ/ → /h/	/ħarb/ → /harb/ 'war'	
/χ/ → /k/	/ʔuχt/ → /ʔukt/ 'sister'	Manner of articulation shift
/ɣ/ → /g/	/mablaɣ/ → /mablag/ 'amount'	
/ʔ/ → ∅	/ðiʔb/ → /ði:b/ 'wolf'	Omission
/ʕ/ → ∅	/muʕallım/ → /muallım/ 'teacher'	

Discussion and Conclusions

This research sheds light on the articulation of Arabic consonants that cause challenges to AFL learners. The absence of some phonetic aspects from the English phonological system had a negative impact on the acquisition of certain Arabic consonants. In other words, emphatic, uvular and pharyngeal articulations do not exist in English; consonants produced with these features were the most difficult for English learners of AFL. Moreover, despite velar sounds exist in English, the participants' erroneous articulation of unfamiliar Arabic velar sounds, viz., /χ/ and /ɣ/ was noticeable. The articulation of the Arabic glottal stop /ʔ/ occupied a moderate position in terms of articulation errors for being an allophone in English rather than a phoneme. However, the role of the articulatory nature of some Arabic consonants cannot be neglected. For a few consonants (/đ/, /q/, /ʔ/ and /ż/), different Arabic dialects showed drastic variations in the articulation of these consonants. Although native speakers pronounce them correctly when using standard Arabic, they replace them by different sounds when speaking informally using their local dialects. Regardless of the native speakers' motivation for altering the articulation of these consonants, this constitutes a piece of evidence to argue that these sounds are open to influence whether because of difficulties in their articulation or the contextual impact. With this being an ingredient of the local dialects phonological system, learners encounter challenges while interacting with native speakers in real-life situations which may negatively affect learning the standard articulation of these sounds.

The findings of the current study are in line with and support the findings of the previous studies in terms of the difficulties in producing the emphatic and pharyngeal consonants (e.g., El Haimeur, 2025; Aldamen & Al-Deaibes, 2023; Shehata, 2015; Binasfour et al., 2017; Al Mahmoud, 2013). However, the present study differs from the previous ones in that the emphatic /ṣ/ did not cause any difficulty for the participants. Moreover, the findings of this study confirm the results of the previous studies in terms of the impact of the participants' L1 on the acquisition of L2, such as those of Al-Saidat et al. (2024), Aldamen and Al-Deaibes (2023), Al-Shalabi (2021), Shehata (2015), Al Mahmoud (2013), and Huthaily (2008).

This study aimed to explore the challenges encountered by non-native learners of Arabic in the area of consonants articulation. The results of the study revealed that the impact of learners' L1 is not the only factor responsible for committing errors in the articulation of Arabic consonants; the exposure to the informal forms of language use played a significant role as the participants of this study were mainly exposed to the local rather than the standard dialect through the daily communications with Saudi native speakers in real-life

situations. The findings of the study have direct implications for language pedagogy, especially in designing instructional approaches that could help AFL learners overcome difficulties with unfamiliar Arabic consonants.

Therefore, the study recommends that course designers, teachers and academic authorities take into consideration learners' L1 when designing course materials, study plans or when teaching Arabic sounds in general and consonants in particular to non-native speakers. This provides them with the phonological differences between the systems of L1 and Arabic. Based on such comparison, more emphasis should be paid to the unfamiliar sounds to help learners minimize and overcome the predictable problematic areas. Moreover, when studying abroad, local dialects should be introduced to the learners gradually inside the classroom, building a kind of awareness of the differences between the language forms they learn inside the classroom and the one used outside. The current study explored the challenges in learning Arabic consonants. Despite the fruitful findings of the current study, it was limited by a small sample size which limits the generalizability of the findings. Researchers are encouraged to include a large, diverse sample to include AFL learners from various linguistic backgrounds, examining the learning of other phonological aspects such as vowel sounds, stress placement, and the various phonological processes. This will offer a panoramic picture of the various phonological challenges encountered by learners of Arabic as a foreign language, which, in turn, will facilitate learning and teaching Arabic sounds to non-native speakers.

Disclosure Statement

The author reported no potential conflicts of interest.

Generative AI Statement

During the preparation of this work the author used Grammarly: Free Essay & Paper Checker in order to check spelling. After using this tool/service, the author reviewed and edited the content as needed and takes full responsibility for the content of the publication.

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