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The Perception of English Long Vowels and Diphthongs by Iraqi EFL University Students

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Abstract

The study investigates the perception of English long vowels and diphthongs by Iraqi EFL students. It reports on the perception test of second level college learners whose mother tongue is Arabic. Because of the difference between Arabic and English vowel systems, it is believed that the learners will find difficulty in the perception of English long vowels and diphthongs and they tend to use long vowels instead of diphthongs in most cases. It also aims to show which long vowels or diphthongs represent more difficulty in the perceived words. After analyzing the data of 20 participants, the findings showed that long vowels and diphthongs show different degrees in perception. The best diphthong to be perceived is /oI/, and then / eI/. The accuracy in perceiving the first diphthong can be accounted for by by SLM and PAM. However, learners change diphthongs into long vowels in most of the pairs. The best perception was for /*a:*/, /u:/ and /i:/ which have similar vowels in Arabic. The most difficult diphthongs to be perceived are centring diphthongs. Misperception is attributed to the difference between vowel systems in Arabic and English. It is also attributed to the similarity of phonetic features in some of the pairs in the data. More proficient learners have better ability in English vowels' perception. Vowels in familiar words are easier to perceive than others. Diphthongs in borrowed words constitute difficulty for learners because of the adaptation of diphthongs in these words.

Keywords: Perception, English long vowels, Diphthongs, Vowel system.

إدراك طلبة الجامعة العراقيين كمتعلمين للغة الإنكليزية كلغة اجنبية للأصوات الصائتة الطويلة والمركبة (الثنائية)

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الملخص

ان هذه الدراسة تبحث في تمييز الطلبة العراقيين المتعلمين للغة الإنكليزية كلغة اجنبية للأصوات الصائتة الطويلة والمركبة (الثنائية). تفيد الدراسة بنتائج اختبار الدراك لمتعلمي المرحلة الثانية في قسم اللغة الإنكليزية ممن لغتهم الام هي اللغة العربية. بسبب اختلاف النظام الصوتي للغتين العربية والإنكليزية فاننا نعتقد بان المتعلمين سيجدون صعوبة في ادراك الأصوات الصائتة الطويلة والمركبة وربما يميل الطلبة الى اختيار الأصوات الصائتة الطويلة بدلا من المركبة الثنائية في معظم الحالات. يهدف البحث أيضا الى ابراز أي الأصوات الطويلة او المركبة في الكلمات والتي تمثل صعوبة اكبر لدى الطلبة. بع تحليل البيانات التي شارك فيها عشرون طالبا تبين ان ادراك وتمييز الصوائت يكون بدرجات متفاوتة. ان الطلبة استطاعوا ان يميزوا

الصوت/ oI / و / eI / بدقة كبيرة. ويمكن ان تعزى الدقة في تمييز الصوت المركب الأول الى نظريات طريقة تعلم الكلام وطريقة الاستيعاب الادراكية. مع ذلك فان المتعلمين استبدلوا الأصوات الصائتة الطويلة بالمركبة في معظم ازواج الكلمات. وفيما يخص الأصوات الطويلة فان بعض الأصوات /a:/ و /u:/ و /i:/ قد تم تمييزها بدقة كبيرة أيضا. واظهرت الدراسة بان المتعلمين واجهوا صعوبة اكبر في تمييز الأصوات المركبة المركزية. ويمكن ان يعزى عدم تمييز الأصوات الى عدة أسباب اهما هو اختلاف النظام الصوتي للاصوات الصائتة في اللغتين العربية والإنكليزية والسبب الثاني يعود الى وجود صفات صوتية مشتكة بين الأصوات في ازواج من الكلمات. وقد تبين بان المتعلمين الأكثر كفاءة كانت لديهم قدرة على التمييز اكثر من غيرهم. إضافة الى هذا فان إدراك الأصوات الصائتة في الكلمات الإنكليزية المألوفة كان اكثر مما هو عليه في غيرها. واخيرها فان المتعلمين واجهوا صعوبة في تمييز الأصوات الصائتة في الكلمات المستعارة من اللغة الإنكليزية لانها كانت قد خضعت لتكييف صوتي.

الكلمات المفتاحية: الادراك، الأصوات الإنكليزية الطويلة، الأصوات المركبة، النظام الصوتي.

1. Introduction

Recent research has underlined the importance of accurate pronunciation. It maintains that successful communication is rarely possible if FL speakers' oral accuracy is below the minimum level regardless of their lexical and grammatical competence (Derwing and Munro, 2015). One of the most difficult aspects of L2 learning is correctly speaking the vowels of L2. The incorrect pronunciation of these vowels greatly affects the amount of a foreign accent that a native speaker perceive. Despite differing opinions regarding the learning mechanisms in sound perception and production, speech models of learning FL speech agree that accurate (perception) and discrimination should come before sound production (Flege, 2003: 322). "Vowel perception problems are manifest by an inability to perceive and distinguish L2 vowels correctly" (Kendall, 2004:2). L2 speakers' perception of an L2 language and the accuracy with which they produce L2 sounds are connected, this means that over time as speakers become more perceptually aware of the phonetic differences of sounds of the two languages, they may be able to create new phonetic categories and produce these sounds more precisely (Fledge, 1991: cited in Erickson, 2010:12). Two models have been proposed to account for phenomenon. These are Speech Learning Model (SLM) and the Perception Assimilation Model (PAM). The first model proposed by Flege (1995: 264f) hypothesizes that a new sound (very different from any L1 category) will not be perceptually assimilated to any L1 category and L2 learners will not eventually encounter significant challenges when perceiving new L2 sounds. If the perceived distinctions between the nearest L1 sound (similar sounds) and the L2 sound are insufficient, then the L2 sound will be treated as an equivalent to the L1. The L1 and the L2 will be combined as a diaphone, a single category is utilized for both sounds that have characteristics of both the L1 and the L2. This learning scenario will lead to perception and production difficulties (Romanelli and Menegotto, 2013: 31f). The perceptual assimilation model (PAM), developed by Best (1994),

proposes that non-native contrasts are prevailed in terms of their phonetic similarity to the phonological categories present in the listener's native language (Harnsberger, 2001; cited in Chan, 2013: 182). It posits that "non-native perception is strongly influenced by the listener's knowledge (whether implicit or explicit) of native phonological equivalence classes and that listeners perceptually assimilate non-native phones to native phonemes whenever possible, based on detection of communalities in the articulator's constriction location and/ or constriction degrees used" (Best et al., 2001: 777). Consequently, L2 sounds are assimilated with the nearest L1 sounds when these sounds are heard based on familiar phonetic features of articulatory gestures. This process of assimilation affects the formation of new categories of L2 sounds. "Both SLM and PAM affirmed that increased experience in perceiving and using the L2, the possibility of approaching native-like pronunciation is increased" (Al Abdely and Thai, 2016: 2). In such a way that with the increased L2 experience, the learner becomes sensitive to the distinctions between the L1 and L2 segments result in fewer instances of assimilation of L2 segments to L1 segments and a new category for the L2 segments may be established within the learner's perceptual system (Best and Strange, 1992: 326). If both phonemes are assimilated equally well or poorly to the same L1 category, discrimination will be most complicated and best for the assimilation of non-native phonemes into two distinct L1 categories. Hence, it will be better for vowels that are dissimilar from one another (Flege, Munro and Fox, 1994; cited in Levey and Cruz, 2022: 163).

2. Problem:

Many students tend to replace diphthongs by short and long vowels and vice versa. They have difficulty in perceiving and hence producing vowels. Definitely, there should be reasons behind the difficulty in perceiving some vowels, especially diphthongs than others. The present study is deigned to examine the perception of English long vowels and diphthongs by Iraqi EFL learners, taking into account the factors influencing the vowels' perception and to give recommendations to both Iraqi EFL learners and teachers to overcome the problem.

3. Aims

The study aims

1. To investigate the perception of long vowels and diphthongs by Iraqi EFL learners.
2. To show which diphthongs are more substituted by long vowels and vice versa.

3. Which long vowels and diphthongs represent more difficulty in the perception. It also aims to examine the validity of SLM and PAM.

4. Hypotheses

The following hypotheses are proposed for examination:

Students tend to change some English diphthongs into long vowels. This is attributed to the interference of mother tongue because the latter exist in their L1.

There may be evidence for a link between perception and linguistic and non-linguistic factors such L2 proficiency and large-scale variation of the L1 and L2 sounds play a role in L2 learning.

5. Limitation

This study examines the perception and discrimination of long vowels and diphthongs in isolated words and not in sentences to avoid the effect of connected speech.

6. English and Arabic Vowel Systems

Before going deeper into the details of the study and reviewing the literature of related study, it would be useful to look at the vowel systems of English and Arabic. These two vowel systems are very different. English vowels are classified according to three criteria: the position of the tongue (close-open), shape of the tongue (front-back) and shape of the lips (Roach, 2009: 11-13) while vowels in Arabic are classified according to length only. English and Arabic vowels are also different in phonetic qualities, for instance most back vowels in English are rounded.

English has twelve vowels. These are five long vowels: /i:, u:, o:, ɜ: and *a*:/, seven short vowels / I, e, æ, D, ʊ, Λ, *∂*/ and eight diphthongs; five closing diphthongs / eI, aI, oI, *∂*ʊ, aʊ/ and three centring / I*∂*, e*∂*, ʊ*∂*/. Arabic vowel system consists of six short and long vowels only which are differentiated in terms of length. These are /i, i:, a, a:, u, u:/. The difference in the number and quality of vowels in English and Arabic may play a role in L2 perception, and IEF students will have difficulty in perceiving and identifying some vowels, and may be those that are not found in Arabic.

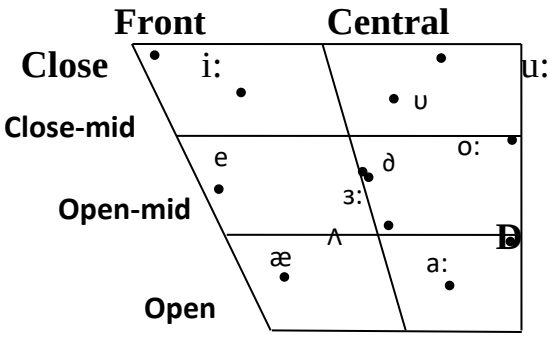

Fig. (1): Standard English Pure Vowels (adopted from Roach, 2009: 13-16)

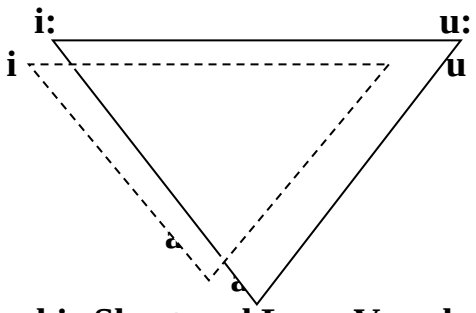

Fig. (2): Arabic Short and Long Vowels (adopted from Al-Ani, 1970: 25)

7. Review of Related Literature

The perception and also production of vowels have been investigated by non-native English speakers of languages with different vowel inventories. Perez's study shows that Spanish speakers are better able to identify new English sounds and that the perception is improved when students are trained to perceive English vowels (Perez, 2005). Chan (2013) also concludes that L2 learners see various English vowels as resembling one or more of their native vowels, and the L2 vowel is assimilated to a vowel with similar articulatory properties. They tend to assimilate non-native phones to native phonemes according to the commonalities that exist between them in articulation. The study of Rato and Rauber (2015) also reveals that the perception of the larger inventory of English L2 vowel is difficult due to L1 -to-L2 mapping issue, that is, to how learners perceive the vowel sounds in the target language in comparison to the vowel categories in their native language. As regards the perception of English vowels, Rato and Carlet (2020) claim that Portuguese learners have a confusion in the perception of short (lax) vowels and their long (tense) counterparts, e.g / I/ and /i:/ and they attribute this to the vowels' acoustic characteristics, such as tongue height and openness. Shuk-Ki (2014) consider that for Cantonese speakers, L2 learners are more adept at identifying back vowels than front ones, such as /I/ and /e/ and that the worst identification was for the pair /u:/ and / ʊ/. In addition, Shuk-Ki (2014) and

Romanelli and Menegotto (2015) find that perception difficulties appear when L1 and L2 vowels are similar.

As regards the perception of English vowels by Arab speakers, Almbark (2012) finds that for Arab learners, /D/ is the hardest vowel to identify, whereas other vowels are rather easier. The study of Al Abdely and Thai (2016) reveals that the English long vowels are more easily perceived than short vowels. Added to this, L2 learners find that the most difficult vowels to identify are /D, Λ, I/ and /o:/, whereas/∂/, /i:/, and /a:/ are easier to identify. They also find that similar L1 and L2 sounds are realized as L1 sounds due to the congruence of phonetic systems across L1 and L2. Ebdey's study reveals that training on vowel discrimination and production help students to identify the phonetic contrasts between L1 and L2 different vowels (Ebdey, 2021).

7.1. Factors Affecting Speech Perception

A number of factors affect the non-native speech perception of foreign language sounds. These are linguistic and non-linguistic. The non-linguistic factors are either internal such as the age of onset of learning (AOL), and native language background, or external such as language use, length of formal instruction, learning context and also quality and quantity of L2 input (Piske, 2007; cited in Rato and Carlet, 2020:206). Even more, orthography and L2 interference, nature and amount of L2 exposure, and proficiency are also considered as the factors that affect L2 learning (Fabra and Romero, 2012; 492). Despite this, the linguistic factors are considered as the most important in L2 learning. The large-scale variation of the L1 and L2 sounds play a role in L2 learning in such a way that when the size difference between the vowel inventories of the two languages is bigger, the L2 learners assimilate several L2 vowels to one native category (Kiviganas, 2019: 13). However, the identification of new vowels will rise with the largest distance between L1 and L2 vowels.

Since English and Arabic are two different languages, this study aims to investigate the accuracy of the perception of English long vowels and diphthongs by Iraqi EFL students and to shed light on the factors that affect the perception.

8. Methodology

Twenty native speakers of Arabic at 2nd year University level in the department of English, of College of Basic Education at Mosul University took part in the study. All of the participants are from Iraq and they are all considered as foreign

language learners. The participants' ability to distinguish between the English vowels they had learned in the first course was assessed using an oral and transcribed word test. All had a positive attitude towards the test process. They were familiarized with the IPA symbols. They all listened to stimuli consists of 18 words. The stimuli have been collected directly from Roach's English Phonetics and Phonology. He is a speaker of standard British English. The words are pronounced in isolation. They were presented in phonetic forms. Each recorded word contains either a long vowel or a diphthong. The participants listened to the recorded words. After receiving a response, they were asked to determine if the one-syllable word contained a long vowel or a diphthong. They had to circle the stimuli they heard. The long vowels and diphthongs are found randomly in words, e.g. /eI/ appears two times in words while /ɔʊ/ appears ones. The participants were encouraged to select their responses as fast as possible.

9. Data Analysis, Results and Discussion

The results of the perceptual study of Iraqi EFL students shows that some English vowels are difficult for the participants to perceive and recognize. The table below shows the percentages of accuracy of the identification of vowels and the number of right and wrong choices.

Table (1) Vowel identification Accuracy

English Words	English Pronunciation	Students' Number	Correct Choice	Number	percentages	Erroneous Choice	number	percentages
mace	/eI/	20	/eI/	16	80%	/i:/	4	20%
code	/ɔʊ/	20	/ɔʊ/	12	60%	/o:/	8	40%
fierce	/Iɔ/	20	/Iɔ/	10	50%	/i:/	10	50%
cairn	/eɔ/	20	/eɔ/	8	40%	/ɜ:/	12	60%
tar	/*a:*/	20	/*a:*/	17	85%	/aI/	3	15%
gear	/Iɔ/	20	/Iɔ/	11	55%	/ɜ:/	9	45%
ski	/i:/	20	/i:/	10	10%	/eɔ/	10	50%
league	/i:/	20	/i:/	11	55%	/eI/	9	45%
broke	/ɔʊ/	20	/ɔʊ/	10	50%	/o:/	10	50%

park	/*a*:/	20	/*a*:/	17	85%	/aI/	3	15%
coin	/oI/	20	/oI/	18	90%	/o:/	2	10%
fawn	/o:/	20	/o:/	7	35%	/∂ʊ/	13	65%
stork	/o:/	20	/o:/	12	60%	/∂ʊ/	8	40%
dour	/ʊ∂/	20	/ʊ∂/	10	50%	/o:/	10	50%
doubt	/aʊ/	20	/aʊ/	13	65%	/*a*:/	7	35%
breathe	/i:/	20	/i:/	16	80%	/eI/	4	20%
loose	/u:/	20	/u:/	15	75%	/∂ʊ/	5	25%
show	/∂ʊ/	20	/∂ʊ/	17	85%	/o:/	3	15%

Discrimination between the minimal pairs with long vowels and diphthongs contrasted had different accuracy. The excellent discrimination is found for only the diphthong /oI/ in the minimal pair /o:, oI/. About 90% of the participants were able to distinguish the diphthong. In other words, 18 participants were able to discriminate the diphthong /oI/ in the word “coin”. The results obtained support the SLM which considers that L2 learners will not face major difficulties when perceiving a new L2 sounds. The participants perceive sounds that are different and do not exist in their L1 system. The other centring diphthong which ends with /I/ and has good identification is /eI /. In the pair, /i:, eI /, /eI / is discriminated by 16 students. It is identified at a rate of 80%. One of the explanations of the high accuracy of identification of /eI/ in the word “mace” is that Arabic has a similar sound sequence, vis. /aj/, as in /ʔajqa ða/ "’ayqatha", while the latter begins with a more open vowel and ends with /j/.

The long vowel /*a:*/ in the pair /*a:*, aI / is also has good identification. At an 85% rate, 17 participants were able to identify it. It is only misidentified by 3 participants. This can be attributed to the fact that Arabic has a similar vowel sound, viz. /a:/ in words like /da:r/ “daar”. The English /*a:*/ and the Arabic /a:/ are close but the former is a back vowel in English. It is thus possible that the participants had already formed a strong mental representation of /a:/ through exposure to the vowel in their native tongue and therefore could easily identify the English phoneme as an instance of it.

The lower but also good identification is also of the vowel /u:/ which has a good discrimination accuracy. It is identified at a rate of 75%. It is identified by 15 participants as /u:/ in the word “loose” /lu:s/ and misidentified as /∂ʊ/ by only five participants. /u:/ is also assimilated to the Arabic long vowel /u:/ found in a word like /bu:m/ “bum”.

As for the identification of the long vowel /i:/, the results are surprising. Although this long vowel is well identified in the word “breathe” /bri:ð /, it is misidentified in the words: “ski” /ski:/ and “league” /li:g/ and replaced by the diphthongs /e∂/, and /eI/ respectively. The identification of /i:/ is at a rate of 80% in “breathe” but its identification has a lower rate in the words “ski” and “league” and at the rates 50% and 55%, respectively in these words. The reason behind this is that the word “breathe” is a familiar word, so the long vowel is easily discriminated by participants while some frequently substitute diphthongs for the long vowel /i:/ in the other two words may be because they tend to over generalize using diphthongs in words instead of long vowels.

The identification of the long vowel /o:/was one of the worst identifications. This vowel is identified as /o:/ by 12 participants in the word “stork” /sto:k/ and by only 7 participants in the word “fawn” /fo:n/ and it is replaced by /∂ʊ/ in this word. The reason for this misidentification is that participants who do not perceive the word's orthographic form believe that the word is “phone” which is more familiar than “fawn” and thus misidentify the long vowel as the diphthong /aʊ /. And it may be that the participants overgeneralize familiar words' vowels or diphthongs to unfamiliar ones.

The diphthong /∂ʊ/ has lower identification in two words in the stimuli, viz. “code” /k∂ʊd/ and “broke” /br∂ʊk/ and having the rates 50% and 60% in these words. However, it is well identified in the word “show” /ʃ∂ʊ/ and 17 of the participants could identify this diphthong. Though Arabic has /aw/, as in /ʔawqada/ “’awqada” which is similar to the English diphthong /∂ʊ/, and all of these words are familiar to participants, but “show” is well-identified, in contrast to the other two words. But the reason for the misidentification of /∂ʊ/ in “code” is that this word is regarded as a Mosuli Arabic borrowing and the participants used to replace the diphthong /∂ʊ/ by /o:/ vowel that exists in Mosuli dialect which is spoken by participants.

The identification of /aʊ/ which ends with a close back vowel /ʊ/ also attained a lower accuracy. 7 participants pronounce the word /daʊt/ with /*a:*/ as /d*a*:t/ instead of /∂ʊ/. There is a 65% identification rate for this diphthong in the stimuli. The reason for the misperception is the similarity of the phonetic features of the long vowel and the diphthong. They both begin with an open vowel. The lack of a corresponding diphthong in Arabic could also be the reason for this misperception.

The students encounter more problems in diphthongs than in pure long vowels. The most difficult diphthongs to perceive are: / I∂, ʊ∂/ and /e∂/. In the pairs /i:, I∂/ and /ɜ:, I∂/, 10 and 11 students select /i:/ and / ɜ:/ instead of / I∂/ after

hearing the words containing /I∂/ diphthong. They could not discriminate this diphthong and they heard the words "fierce" /f I∂ s/ as /fi:s/ and "gear" /g I∂/ as /g ɜ:/. The diphthong /ʊ∂/ was also misidentified as /o:/ by 10 students, at a rate of 50%. The word "dour" /dʊ∂/ is misperceived as /do:/. The lowest accuracy was for the discrimination of the vowel contrast / e∂, ɜ:/ in "cairn". 12 students could not identify /e∂/ and they perceive the word "cairn" /ke∂n/ as /kɜ:n/. The reason of the misidentification of these words is the interference of the Arabic language. Students tend to replace the diphthongs / I∂, e∂, and ʊ∂/ by the long vowels /i:/, /ɜ:/, and /o:/, respectively. All these diphthongs glide towards /∂/ and Arabic has no such diphthongs so they are all replaced by long vowels in Arabic

The results of the study provide substantial support for the research aims and hypotheses outlined earlier. The analysis reveals that English long vowels and diphthongs are perceived with different degrees. It supports hypothesis 1 which predicts the substitution of English diphthongs by long vowels by Iraqi EFL students. English long vowels are perceived more accurately than diphthongs. It is possible that Iraqi students perceive English vowels in terms of phonetically equivalent Arabic vowels, as assumed by SLM and PAM. The best perception was for /*a:*/ and /u:/ which have similar vowels in Arabic.

As regards the 2nd hypothesis, the results show that the worst perception was for the diphthongs /I∂, ʊ∂/ and /e∂/. They are all replaced by long vowels because Arabic vowel system lacks such vowels. The difficulty in perceiving these sounds cannot be accounted for by SLM and PAM. The only different diphthongs that were easier to perceive are /oI/ and /eI/. The results also confirm that learners who acquire more L2 experience will be able to approximate the differences between the two languages. Hence, they are more accurate in perceiving L2 diphthongs. The phonetic similarity between long vowels and diphthongs in some pairs like /aʊ, a:/ is another factor for the misperception. The other factor that affects the perception in the familiarity of words. Vowels in more familiar words are easier to perceive than in others. Students also tend to overgeneralize the use of such vowels to other similar words, as in fawn which misperceived as /f∂ʊn/. A final factor that affects the perception is the existence of English borrowed words in Arabic. Iraqi learners also exhibit poor perception of diphthongs in these words because they have been adapted into long vowels. Overall, the students encounter more problems in perceiving diphthongs than in pure long vowels.

10. Conclusions, Recommendations and Suggestions

The demand of mastering English language as the world's international tool of communication requires the learners to have good proficiency in English. According to the results of our study, it can be drawn the conclusion that English

long vowels and diphthongs are perceived with different degrees. It has been shown that good identification and perception is for the long vowels that have similar or equivalent Arabic vowels /*a:*/, /u:/, /i:/ and even /eI /. The results do not support the SLM proposed by Best/ Fledge except in the perception of the English diphthong /oI /. Since the worst identification was for the centring diphthongs in English. These vowels have no counterparts in Arabic, which contributes to their poor perception. Professional learners do better than learners in low proficiency. There is also a link between good perception and familiarity; more familiar words are well perceived. Sometimes, because of this familiarity, there will be a hypercorrection being made by learners. Other factors that have influenced the learners' response is the existence of English borrowed words and due to the adaptation in these vowels, the diphthong is misperceived into long vowel. Additionally, it has been demonstrated that contrasts with larger spectral distances are seen more precisely than those with lower spectral distances, as in / and /*a:*/, and /aI/.

The results show that the perception of new sounds in an FL is not an easy task. It cannot be achieved only theoretically but also practically. There should be new methods to improve teaching English phonetics. Teachers should focus on teaching vowel chart illustrative diagrams. Training should include exaggerated examples of individual phonemes. It is also necessary to expose beginners to vowel sounds that are repeated and pronounced separately. Teaching such material have to include multimedia pronunciation tools that incorporate examples of native speech as well as orthographic representations of word patterns. Even more, to improve the learning characteristics of the most different vowels in a FL, spectrographic devices must be utilized. Training on vowel perception and production will help students to focus on the features of every single sound and on contrasts between long vowels and diphthongs.

Due to the correlation between the perception and production of English long vowels and diphthongs, further study would be proposed to examine both perception and production of Iraqi EFL students at Mosul University.

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