The Phonological Analysis of English Front Vowels in the Spoken English of Selected Undergraduates of Federal University Wukari

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Abstract
This research analyses the English front vowels in the spoken English of selected undergraduates of Federal University Wukari. Therefore, 120 respondents were randomly selected. Giles and Coupland's (Giles and Smith, 1979) Communication Accommodation Theory (CAT) and Lado's (Lado, 1957) Contrastive Phonology Theory (CPT) were used as the theoretical frameworks. CAT was used to determine the mutual phonological intelligibility and accessibility of the respondents while CPT was used to describe the systems of languages by comparing them with others and predicting the areas of difficulties so that the second language learners can ease the difficulties. Questionnaires and read-aloud task were the research instruments used for data collection. The findings revealed that majority of the respondents found it very difficult to correctly articulate the front vowels in the test items thereby pronounced 'veto', 'liberation', 'jeopardise', and 'timbre' as [vɛto], [laibireiʃɔn], [dʒɛpadaiz], and [timba] instead of /ˈviːtəʊ/, /lɪbərˈeɪʃən/, /ˈdʒepədaɪz/, and /tæmbə/ respectively. Also, respondents' overall performance of 21.7% shows that they had problems in articulating the English front vowels pronouncing /iː/ as [ɛ], /ɪ/ as [u], /e/ as [iː]; and /æ/ as [i]. Hence, recommendations were made in a bid to better ESL speakers' pronunciation proficiency.

Keywords: front vowels, phonology, phoneme, grapheme, pronunciation

Background to the Study

In a speech community, language is the vehicle with which people express their thoughts and ideas in form of speech or writing. According to Sapir (1921: 18), "language is a purely human and non-instinctive method of communicating ideas, emotions and desires by means of a system of voluntarily produced symbols." Also, Cruttenden (1980: 4-5) describes language thus:

> …a system of conventional symbols used for communication by a whole community, the pattern of conventions covers a system of significant sound units, the inflection and the arrangement of words and the association of meaning with words…

In my opinion, language is a tool by which human beings relate to one another with the use of conventional but arbitrary signs. It can be inferred from the scholars above that there are some features which are common to languages. Some of these are arbitrariness, conventionality, and natural acquisition. For instance, any child that is born into a society naturally acquires the language of its environment without any stress. As a matter of fact, it will be very difficult for you to easily remember how you acquired your mother tongue or first language. The reason is because the process of acquisition is usually without any stress. Therefore, its description will be equally easy. But if the same child attempts to learn the second language, definitely it will learn with some amount of dedication and determination. The degree of success will depend upon some factors which may include the quality of the person he takes as his model, the appropriateness of the environment for learning, and the child's inborn ability at language learning. You can see that while you acquired your first language (indigenous language) without stress, you are still striving to learn the English language which is the second language in Nigeria.

Presently, over one billion people around the world speak English as a second language. Unarguably, in a second language situation like this, there are types of variety of English language across the world that is considered as 'new Englishes'. That is why Holmes (2013: 194) defined new Englishes as 'varieties which have developed in post-colonial societies where the colonial powers have been displaced but the legacy of English remains'. These varieties of English are called institutionalised and non-institutionalised. Adeyanju (2007: 3) explains that the types of English like South African English, Australian English, New Zealand English, American English, and British English can be considered as 'institutionalised' or 'established' varieties of English, while African Englishes, such as Ghanaian and Nigerian English are the non-institutionalised or non-established varieties. But as a result of the focus of this study, our focus is 'Nigerian English' or the English spoken in Nigeria. This type and status of English spoken in Nigeria is categorised as 'English as a second language' because the speakers had earlier acquired their first language, mother tongue or indigenous language.

As a matter of fact, Nigeria is a multilingual nation that breeds many indigenous languages. By implication, it becomes totally difficult for them to actualise correctness at the pronunciation of English sounds. As at this juncture, due to unique linguistic backgrounds that are evident in Nigeria, many Nigerians still experience difficulty in the course of articulating some English phonemes especially vowel sounds. Based on the foregoing, this work sets out to examine the articulation of English front vowels and its implications on speech communication among the selected undergraduates of Federal University of Wukari, Taraba State.

Previous studies on the phonological problems of Nigerian speakers of ESL speakers/learners concentrate more on the effects of MT interference, without paying much attention on the wrong articulation of some of the phonemes especially the front vowels in the north-eastern part of Nigeria. Although there are some scholars who work on this area, especially on the area of phoneme articulation by speakers or learners of ESL in Nigeria. Some of these scholars include Akinjobi (2004), Tsojon and

Aji (2014) and Ogunrinde (2017). Akinjobi mainly looks at the weakness of the vowels without considering the other possible phonological challenges faced during the articulation of vowels, but this study intends to fill the gap. Also, Tsojon and Aji (2014) work only on Jukun-Wapan speakers' pronunciation in the spoken English but this research intends to cover some other tribes that are in north-eastern part of Nigeria where the participants are selected. Likewise, Ogunrinde (2017) works on the articulation of alveolar trill /r/ by Tiv speakers of English. Here, the emphasis is only on a particular consonant but this study intends to look at the vowels specifically the front vowels which might pose more problems to learners of English. However, they do not lay more emphasis on English front vowels and speakers of English in north-eastern part of Nigeria. Hence, this works intends to fill this lacuna by phonologically analysing the front vowels in the spoken English of undergraduates of Federal University Wukari in the north-eastern part of Nigeria.

The specific objectives of the study are to describe the respondents' realisations of the front vowels; determine the respondents' performance based on their demographic information; and identify the test item(s) that pose(s) more pronunciation difficulties to the respondents. This study is significant not just to the undergraduates of Federal University Wukari but also to the second language learners of English. It shows how it is important for students to see the need in mastery of sounds to enhance effective communication, and it will also be of great benefit to lecturers especially those that specialise in phonetics and phonology to identify the areas of difficulty in the spoken English of the undergraduates of Federal University of Wukari.

Literature Review
The English vowel sounds

Vowel sounds are speech sounds that are produced without any audible obstruction of the airstream from the lungs and other speech articulators, unlike consonant sounds which are produced with total or partial obstruction of the air. In other words, English vowel sounds are speech sounds produced by an articulation with little or no constriction of the mouth passage. In the production of a vowel sound, there is free flow of air from the lungs through the oral cavity. Although, the vocal cord could be raised, it is not raised to form contact with any other organ as to obstruct free flow of the airstream. Since all vowels are voiced phonemes, they are produced with a voiced pulmonic regressive speech mechanism. There is vibration at the vocal folds in their productions.

However, vowels are described considering the shape of the oral cavity, which depends on the position of the highest point of the tongue during the production. The twenty vowels of English are divided into twelve pure vowels called monophthongs (7 short and 5 long vowels) and eight diphthongs (3 centring and 5 closing diphthongs). As earlier mentioned, the vowels include /ɪ/, /e/, /ɒ/, /ʊ/, /æ/, /ʌ/, /ə/, /iː/, /ɜː/, /ɔː/, /uː/, /ɑː/, /ɪə/, /eə/, /ʊə/, /eɪ/, /ɔɪ/, /aɪ/, /aʊ/ and /əʊ/.
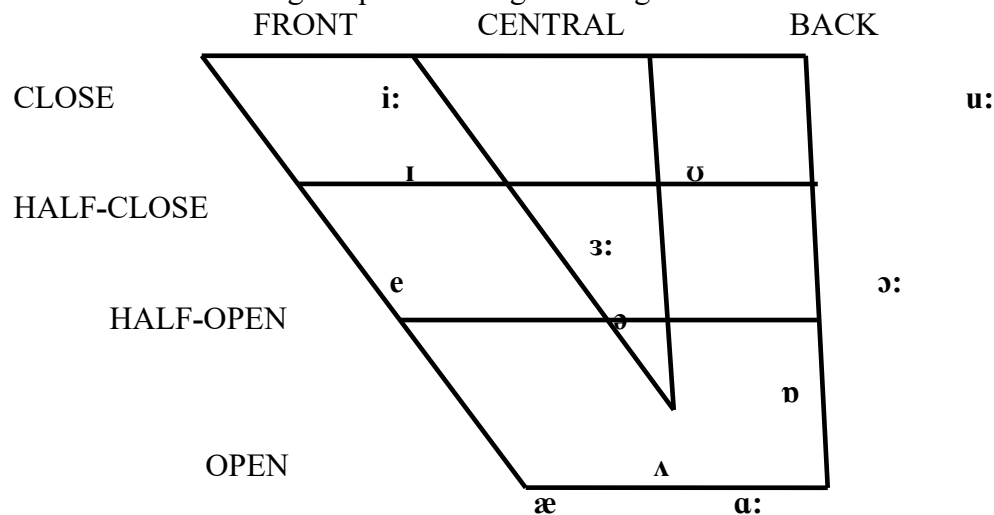
Classification of English pure vowels using lip and tongue

Generally, there are basically three factors used in the classification of the vowel sounds of different languages. These include the tongue height, tongue part, and lip posture. Classification of vowels using tongue height is when the tongue is raised high to the roof of the mouth, but not to the point that brings friction. The height of the tongue in the production of vowel sounds can be close/high (close/high vowels are produced when the tongue is at the highest possible point), open/low (open/low vowels are produced when the tongue is at the lowest possible position) or be at intermediate levels (intermediate vowels are produced when the tongue is in-between the highest and the lowest positions, that is, half-close (close mid or mid-high) or half-open (open-mid or mid-low).

The second classification is the tongue part. This means the part of the tongue that is used in the production of vowel sounds. The part of the tongue used can be front (the front part of the tongue is used in the production of the front vowels), back (the back part of the tongue is used in the production of the back vowels) and central (the central part of the tongue is used in the production of the central vowels).
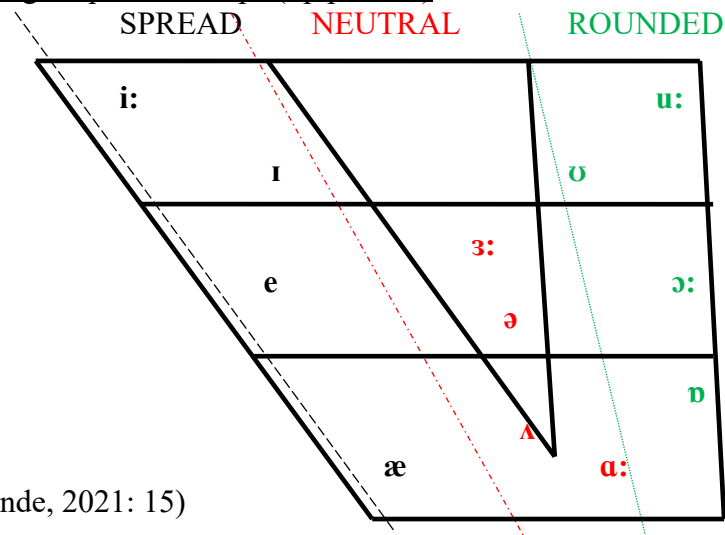
The third classification is shapes of the lip or lip postures. This describes the shapes of the lips in the course of producing vowel sounds. The lips can assume three main postures in the course of producing a vowel sound, that is, it can assume spread, rounded or unrounded (neutral) position (Ogunrinde, 2017: 13). See diagrams in figures1 and 2 for clearer explanation.

Fig. 1: English vowel chart I showing the part and height of tongue

Culled from (Ogunrinde, 2021: 14)

Fig. 2: A chart showing shapes of the lips (lip posture)

Culled from (Ogunrinde, 2021: 15)

Likewise, the table below presents the description of English pure vowels according to their descriptions in the above diagrams.

Table1: Description of English pure vowels

Pure vowels	Description
/i:/	front close spread
/ɪ/	front half-close spread
/e/	front half-open spread
/æ/	front open spread
/ɑ:/	back open neutral
/ɒ/	back open rounded
/ɔ:/	back half-open rounded
/ʊ/	back half-close rounded
/u:/	back close rounded
/ʌ/	central open neutral
/ɜ:/	central half-close neutral
/ə/	central half-open neutral

On the basis of vowel nucleus, vowel sounds are classified into three divisions which include monophthongs, diphthongs, and triphthongs. The table below explains better.

Table 2: Tabular representation of division of vowel sounds

S/N	Monophthongs		Diphthongs		Triphthongs	
	Sound	Word & Transcription	Sound	Word & Transcription	Sound	Word & Transcription
1	/i:/	seat /si:t/	/eɪ/	day /deɪ/	/eɪə/	sprayer /spreɪə/
2	/ɪ/	sit /sɪt/	/aɪ/	buy /baɪ/	/aɪə/	fire /faɪə/
3	/e/	bed /bed/	/ɔɪ/	noise /nɔɪz/	/ɔɪə/	royal /rɔɪə/
4	/æ/	man /mæn/	/əʊ/	go /gəʊ/	/əʊə/	sower /səʊə/
5	/ɑ:/	cart /kɑ:t/	/aʊ/	cow /kaʊ/	/aʊə/	sour /saʊə/
6	/ɒ/	cot /kɒt/	/ɪə/	dear /dɪə/		
7	/ɔ:/	court /kɔ:t/	/eə/	share /ʃeə/		
8	/ʊ/	pull /pʊl/	/ʊə/	pure /pjʊə/		
9	/u:/	pool /pu:l/	**Eight Diphthongs / Gliders**		**Five Triphthongs**	
10	/ʌ/	come /kʌm/				
11	/ɜ:/	bird /bɜ:d/				
12	/ə/	above /əbʌv/				
Twelve Monophthongs / Pure Vowels						

Extracted from (Aboki, 2017: 11)

The English graphemes and phonemes

In English, letter is the basic element of written language. The name grapheme is given to the letter or combination of letters that represents a phoneme. For example, the word 'ghost' contains five

letters and four graphemes (<gh>, <o>, <s>, and <t>), representing four phonemes: /g/, /əʊ/, /s/, and /t/ (/gəʊst/). There is much more variability in the structure of written language than there is in spoken languages. Whereas, all spoken languages utilise a basic distinction between consonants and vowels, there is no such common thread to the world's written languages. It is believed, beginners are taught grapheme-phoneme correspondences when they begin elementary schools. These associations are easier to learn if students already know the names of letters, because most letter names include relevant sounds, for example /t/ is 'tee', and /k/ is 'kay'. There are about forty distinctive phonemes in English but seventy letters or letter combinations to symbolise phonemes. This makes pronouncing spellings easier than writing correct spellings.

Graphemes are said to be the smallest components in orthography and it causes a change in meaning. In English alphabet, the switch from 'cat' to 'bat' introduces a meaning change. Therefore, **c** and **b** represent different graphemes. It is usual to transcribe graphemes within angle brackets, to show their special status: <c>, <b>. The main graphemes of English are the twenty-six units that make up the alphabet. As a matter of fact, phonemes are not realisable without graphemes. As earlier discussed, angle brackets < > are used for graphemes or inverted commas ' ', for instance, <t> or 't' while slanting lines / / are for phonemes, for instance, /t/.

A Grapheme is a symbol used to identify a phoneme; it is a letter or group of letters representing the sound. A grapheme can be one letter, for instance, <c> in 'car' where it makes a consonant /k/ sound. Also, a two-letter grapheme is in "team" where the <ea> makes a long /i:/ sound. It can be a three-letter. Likewise, a four-letter grapheme can be found in the word "eight" where "eigh" makes a diphthong /eɪ/ sound. Moreover, a grapheme can have a zero phonemic representation, for instance, grapheme <t> is silent in 'beret'. To confuse everyone, some phonemes (sounds) can be spelled with different graphemes (letters). The <k> sound can be spelled with a <c>, <k>, or <ck> grapheme. Also, quite a few graphemes can be used for the long /i:/ phoneme, for instance, <e> in 'regal', <oe> in 'amoeba', <ey> in 'key' and others.

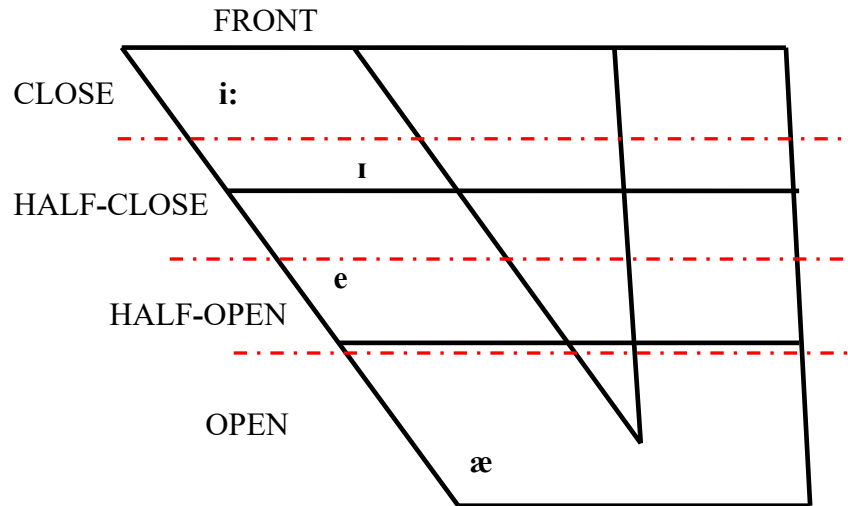**Graphemes of English front vowels**

The following are the various graphemes of English front vowels. In the first place, the ones for front half-close spread /ɪ/ are <i> in 'liberation', <e> in 'examination', <a> in 'village', <u> in 'busy', <ui> in 'circuit', <y> in 'symbol' and <o> in 'women'. Also, the graphemes for front close spread /i:/ include <ee> in 'wheel', <e-e> in 'athlete', <e> in 'tragedian', <ea> in 'wean', <ei> in 'receipt', <ie> in 'grief', <eo> in 'people', <oe> in 'subpoena', <ae> in 'alumnae', <ey> in 'key', <uay> in 'quay', <i> in 'oblique' and <i-e> in 'police'. Furthermore, graphemes for front open spread /æ/ are <a> in 'sand', <ai> in 'plait' and <i> in 'timbre'. Moreover, the ones for front half-open spread /e/ are <e> in 'help', <ea> in 'meadow', <ai> in 'said', <ay> in 'says', <ie> in 'friend', <ei> in 'leisure', <u> in 'bury', <eo> in 'jeopardise', <a> in 'many' and <ae> in 'haemorrhage' (Ogunrinde, 2016).

Front vowels

Front vowels are produced with the front part of the tongue raised towards the hard palate. Its defining characterisitics being that the tongue is positioned as far in front as possible in the mouth without creating a constriction that would make it a consonant. Front vowels are also called 'bright vowels' because they are perceived as sounding brighter than the back vowels (Williamson, 2015). Therefore, the front vowels include /i:/, /ɪ/, /e/ and /æ/. These four vowels are classified as the 'front vowels' because the front part of the tongue is involved in their production. However, the *figure 1* above

illustrates the part of the tongue used in the production of the front vowels and *figure 3* below shows the front vowel chart.
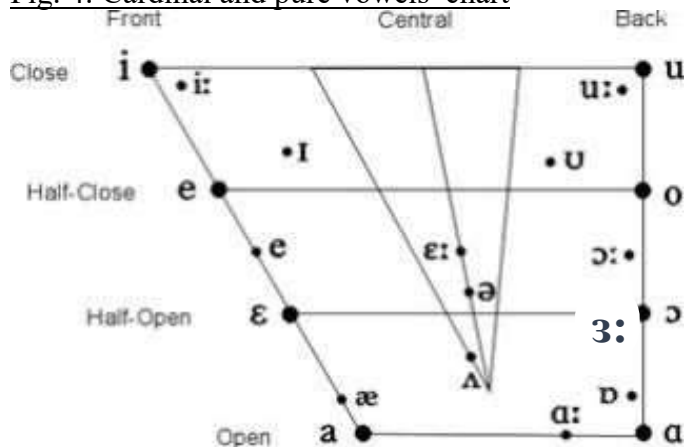
Fig. 3: English front vowel chart

Culled from (Ogunrinde, 2021: 15)

From the above diagram, it is obvious that the front vowels are distributed in the vowel space along the vertical tongue height axis (from high/close to low/open). They are all made with spread (unrounded) lips.

Description of English front vowels

In the production of front close spread /i:/, the front of the tongue is raised to a height slightly below and behind the front close position; it should be noted that the lips are spread; also the tongue is tense, with the side rims making a firm contact with the upper molars. The quality is nearer to cardinal vowel [i] than to cardinal vowel [e] (See *figure 4* below). The /i:/ sound does not normally occur in a syllable closed by /ŋ/ (Cruttenden, 2001: 105). For instance, consider the following words and their transcriptions with syllable divisions: 'being' /biː.ɪŋ/, 'been' /biːn/, 'bing' /bɪŋ/, 'bin' /bɪn/.

Fig. 4: Cardinal and pure vowels chart

Extracted from (Mosaic, 2024)

Note: the big dot (●) shows the exact spot where the cardinal vowel is placed and the small dot (•) is for English pure vowel.

The front half-close spread /ɪ/ is produced with a part of the tongue nearer to centre than to front raised just above the half-close position; the lips are loosely spread; the tongue is lax (compared with the tension for /iː/), with the side rims making a light contact with the upper molars. The quality is that of a centralised cardinal vowel [e]. The sound may occur in initial and medial positions in words, for instance, 'i<u>ma</u>ge' (Cruttenden, 2001: 107).

For the production of front half-open spread /e/, the front of the tongue is raised between the half-close and half-open positions; the lips are loosely spread and slightly wider apart than for /ɪ/; the wide rims making a slight contact with the upper molars. The quality lies between that of cardinal vowel [e] and that of cardinal [ɛ] (*see figure 4 above*). Mind you, /e/ does not occur in the final and open syllables.

In the articulation of /æ/ sound, the mouth is more open than for /e/; the front of the tongue is raised to a position halfway just above open, with the side rims making a very slightly contact with the back upper molars; the lips are neutrally open. This vowel has become more open recently, previously being nearer to cardinal vowel [ɛ] where now it is now close to cardinal vowel [a] (*see figure 4 above*). This traditionally short vowel is now generally longer in RP than the other short vowels /ɪ, e, ʌ, ɒ, ʊ/. Such lengthening is particularly apparent before voiced consonants, eg in *bad*, *man*, *cab*, *bag*, *badge*; /æ/ in this these contexts is almost equivalent to the long vowels, so *badge* /bædʒ/ and *barge* /bɑːdʒ/ have vowels of similar length (Cruttenden, 2001: 111).

Theoretical Frameworks

The theories employed are Communication Accommodation Theory (CAT) and Contrastive Phonology Theory (CPT), CAT provides a wide-range framework aimed at predicting and explaining many of the adjustments individuals make to create, maintain, or decrease social distance in interaction, especially in an ESL environment like Nigeria. Giles and Smith (Giles and Smith, 1979) developed it. It explores the different ways in which we accommodate our communication, our motivations for doing so, and the consequences. This theory is concerned with the links between language, context, and identity. It focuses on the patterns of convergence, which is explained below. Convergence is considered the historical core of CAT. It refers to a strategy whereby individuals adapt their communicative behaviours in terms of a wide range of linguistics (for example, speech rate, accents), paralinguistic (for example, pauses, utterance length), and nonverbal features (for example, smile, gazing) in a way as to become more similar to their interlocutors' behaviour. For instance, in a L2 environment like Nigeria, speakers can converge in the articulation of words that have silent letters. If speaker 'A' who is a Nigerian that has been well and specially trained in this area, and speaker 'B' is on the contrary, though a Nigerian. In their dialogue, speaker 'B' says, 'Give me the timbre [timba]' instead of pronouncing /tæmbə/. In Giles and Smith's theory, speaker 'A' has to converge or shift his/her speech pattern to resemble his/her interlocutor's for a successful communication in their conversation.

The second theory employed is CPT. It is founded by Structural Linguistics and Behaviourist. This theory was propounded by Lado and Fries. These scholars were concerned with why some elements of the second language (L2) pose more difficulties to learners. This approach describes the systems of languages by comparing them with others and predicting the areas of difficulties so that the L2 learners can ease the difficulties. According to Lado (1957), the best approach to handle the problem of negative transfer is to compare the systems of first language and second language. He explains further that this is the best way to ease the L2 learning difficulties. For instance, according to CPT's point of view, all

these wrong pronunciations of sounds are mainly because most of these sounds are not attested in the sound systems of respondents' language. For instance, English front vowels like /i:/, /ɪ/ and /æ/ are not present in Yoruba sound system. But what we have in Yoruba sound system are /a/, /e/, /ɛ/, /i/, /o/, and /ɔ/. Likewise, in Yoruba or other Nigerian language sound system, there is *grapheme to phoneme* total correspondence making it simple to learn or pronounce (<a> → /a/ in 'a̱yò' = joy) but reverse is the case in English. A grapheme in English may have many phonemic representations (<a> → /ɪ/ in 'im a̱ge', /ɔ:/ in 'f a̱lcon', /ɒ/ in 'sw a̱llow', /ɑ:/ in 'f a̱ther', /æ/ in 'p a̱t', /ə/ in 'batsm a̱n'). English orthography or sound systems is complex that is why some respondents wrongly pronounced word like 'v e̱to' as [vɛto] instead of /ˈv**i**:təʊ/ because <e> is pronounced as /ɛ/ in some Nigerian languages.

Methodology

The research is set to carry-out a phonological analysis of the English front vowels in the spoken English of selected undergraduates of Federal University Wukari. The method used in collecting data was administering of questionnaire with read-out task. This was used to obtain information from the respondents. The population of this research work is made up of twelve departments (i.e. Accounting, English, Medical Laboratory Science, Physics) from six faculties with twenty respondents from each faculty (10 in each department). Thus, random sampling techniques were adopted in collecting the data from one hundred and twenty (120) respondents which comprises sixty male and sixty female respondents respectively. The data were obtained through text-based instrument to test the articulation of the front vowels in the spoken English of the respondents. The questionnaire was designed to test the articulation of the respondents reading of the test items and a *voice recorder application* was used in recording the respondents' reading of the test items in sentence-contexts and in words-in-isolation in order to assess their phonological processing skills; and to determine whether they are mindful of the vowels which is considered as the prominent challenge of the respondents. The question was classified into three sections: Section 'A' contains the respondents' background information which includes sex, department/faculty and their interest in learning spoken English. Section 'B' contains precisely twelve short sentences (sentence-contexts) involving the test items while Section 'C' contains twenty-four test items of words-in-isolation.

In obtaining data, the respondents were administered questionnaire which comprises read-aloud task which contains short sentences to enable the researcher to discover the problems of the respondents in articulating the vowels. The researcher closely observed his respondents while reading the test items and observed that the respondents were responding greatly not mindful or conscious of the spelling of words. The researcher's personal involvement in the exercise made it easier to gather data needed for the study. However, the distribution and collection of data were done the same day in each of the departments. A total number of 120 undergraduates were selected from the twelve departments. The eight test items are made up of two words having one example of front vowels, that is, two words multiplied by four front vowels equals to eight test items. The 120 respondents were made to read eight short sentences containing the test items. Descriptive analysis using simple percentage method was used to analyse the data. The data collected were perceptually analysed to identify the respondents' elicitation of the test items. Descriptive analysis accounts for the number of frequency recorded in respondents' performances of their correct and incorrect articulations of the test items. The descriptive analysis is presented in simple percentage below. The total number of responses on each item in the questionnaire is rated 120. The respondents, who have similar or the same responses to a particular question, are summed up and placed over 100 multiplied by 120. For example, $\frac{x}{120} \times \frac{100}{1}$ where x is equal to the total

number of the respondents with similar or correct responses on a particular item and 120 is equalled to the total number of the respondents while 100 is equal to the total percentage.

Results and Discussion

The analysis of respondents' performance based on their demographic information, their performance in the articulation of all the test items with their overall performance, and their performance in words-in-isolation and sentence-contexts are succinctly discussed. Similarly, the test items posing more difficulties to the respondents are unfolded. Likewise, the semantic implications of the test items are discussed below.

Respondents' performance based on their demographic information (sex, departments and interest)

The sample population of the study comprised of 60 males and 60 females (sex). It was discovered that out of the total obtainable scores of 960 for male and 960 for female respectively, the female students performed better than their male counterparts. The female respondents scored 220 out of 960 (33.3%) in the articulation of the test items (front vowels) in sentence-contexts and words-in-isolation respectively, while the male respondents scored only 196 (20.4%). See the table below for better illustration.

Table 3: Respondents' performance based on their sex

Variable	No of resp.	No. of the test items	Articulation of the Respondents		Total obtainable scores per variables (male and female)
			Correct Frequency (percentage)	**Incorrect Frequency (percentage)**	
Male	60	Sentences-context (8) Words-in-isolation (8) (8 + 8 = 16 x 60 = 960)	**196 (20.4%)** ($^{196}/_{960}$ x 100 = 20.4%)	764 (79.6%) ($^{764}/_{960}$ x 100 = 79.6%)	960 (16×60=960)
Female	60	Sentences-context (8) Words-in-isolation (8) (8 + 8 = 16 x 60 = 960)	**220 (22.9%)** ($^{220}/_{960}$ x 100 = 22.9%)	740 (77.1%) ($^{740}/_{960}$ x 100 = 77.1%)	960 (16×60=960)
Total	120	960 + 960 = **1,920**	196 + 220 = **416**	764 + 740 = 1,504	1,920

The result of this analysis further showed that despite the poor performance of both, the females had an edge over the males having 22.9% success against the males' 20.4% performance. The result of this finding is in consonance with the view of scholars like Steinberg (1993) who asserts that the females are more endowed with language proficiency than their male counterparts.

In addition, analysis of the respondents' performance against their departments was carried out thus. The randomly selected departments were twelve. The result of the analysis in the table below revealed that out of the total obtainable scores of 160 in each department, the respondents from English Department scored 92 (57.5%) which is an above average performance against their counterparts in other departments especially respondents from the Medical Laboratory Science with a very low score of 10 (6.3%). The better performance of respondents from the English could be as a result of special

training acquired by the students in phonetics and phonology courses using language laboratory equipment or software often in a bid to attaining a native-like accent. This made them to be conversant with the correct pronunciation of some of those test items (front vowels). See the table below for better explanation.

Table 4: Respondents' performance based on their departments

| Variables | | No of resp. | Articulation of the Respondents | | Total Obtainable scores per Departments (10 respondents; 8 test items in isolation + 8 in sentences = 16) |
| | | | Correct Frequency (percentage) | Incorrect Frequency (percentage) | |
Faculty	Department				
Human-ities	English	10	**92 (57.5%)**	68 (42.5%)	160 (10×16=160)
	Sociology	10	38 (23.8%)	122 (76.2%)	160 (10×16=160)
Manage-ment	Bus Admin.	10	28 (17.5%)	132 (82.5%)	160 (10×16=160)
	Accounting	10	20 (12.5%)	140 (87.5%)	160 (10×16=160)
Pure & Applied Science	Micro-biology	10	38 (23.8%)	122 (76.2%)	160 (10×16=160)
	Physics	10	52 (32.5%)	108 (67.5%)	160 (10×16=160)
Agric. & Life Sci.	Agric Econs & Ext.	10	36 (22.5%)	124 (77.5%)	160 (10×16=160)
	Animal Prod. & health	10	22 (13.8%)	138 (86.2%)	160 (10×16=160)
Educat-ion	Physics Education	10	20 (12.5%)	140 (87.5%)	160 (10×16=160)
	Biology Education	10	24 (15%)	136 (85%)	160 (10×16=160)
Health Science	Medical Lab. Science	10	**10 (6.3%)**	150 (93.7%)	160 (10×16=160)
	Medicine & Surgery	10	36 (22.5%)	124 (77.5%)	160 (10×16=160)
Total		120	**416** (21.7%)	**1,504** (78.3%)	**1, 920**

Moreover, this section presents the analysis of the respondents against their levels of interest in learning oral English. This is to ascertain if one's level of interest in a particular field of study affects one's performance in the articulation of test items. Below is the table that explains the result of the findings better.

Table 5: Respondents' performance based on their levels of interest

| Variable | No of resp | Articulation of the Respondents | | Total obtainable scores per Test Items |
		Correct frequency (percentage)	**Incorrect frequency (percentage)**	

Interested	22	154 **(43.8%)** *(154/352x100= 43.8%)*	198 (56.2%) *(198/352x100 =56.2%)*	352 (22×16=352)
Fairly interested	79	302 **(23.9%)** *(302/1264x100=23.9%)*	962 (76.1%) *(962/1264x100=76.19%)*	1,264 (79×16=1,264)
Not interested	19	48 **(15.8%)** *(48/304x100=15.8%)*	256 (84.2%) *(256/304x100=84.2%)*	304 (19×16=304)
Total	**120**	525	1,395	**1,920**

Considering the analysis in the table above, it is clear that the respondents' levels of interest in learning oral English had an effect on their performance. The result revealed that those with high level of interest (interested) recorded 43.8%, this is above 40% pass mark, having an upper hand over their counterparts with little level of interest (fairly interested) which recorded 23.9% poor performance and those without interest (not interested) with a very poor performance of 15.8%. This is as a result of the fact that people naturally put in their effort in learning whatever they develop interest in.

Respondents' performance in the articulation of all the test items

This section presents the analysis of respondents' performance based on each of the test items which include 'veto', 'penalise', 'liberate', 'women', 'jeopardise', 'meadow' 'plait', and 'timbre'. The analysis is presented below.

Based on the result from the table below, 70 (14.6%) was recorded as the correct articulation which is an evidence of a poor performance. In other words, majority of the respondents pronounced the front close spread /i:/ as [ɛ]. This is affirmed when they pronounced 'veto' and 'penalise' as [vɛto], [pɛnalias] instead of /vi:təʊ/, /pi:nəlaɪz/ respectively. This could be as a result of *grapheme to phoneme total correspondence* in their MTs such as Yoruba, Ibo, Hausa and others. For instance, grapheme <e> in Yoruba is pronounced as /ɛ/, Yoruba speakers among the respondents are likely to pronounce it this way (see table 6 below for better explanation).

One hundred and twenty respondents actively participated in the pronunciation of 'liberate' and 'women'. It was revealed that out of 480 times when the test items were pronounced, only 90 (18.7%) were the correct elicitations. Instead of articulating 'liberate', 'women' as /ˈlɪbəreɪt/, /ˈwɪmɪn/, they wrongly pronounced them as [laibireit], [wumɛn]: /ɪ/ → [ai], [u], [ɛ]. This could be as a result of the respondents' MT interference and over-generalisation problem. In the first place, this is a problem of MT interference from respondents' L1 to English. For instance, graphemes <o> and <e> in some Nigerian languages (i.e. Yoruba) are pronounced as [o] and [ɛ]. Secondly, it is an over-generalisation problem because respondents assumed that grapheme <i> in 'liberate' is pronounced as /aɪ/ as in /ˈlaɪbəreɪt/. It was revealed that respondents over-generalised or assumed that inasmuch the <i> in 'library' is pronounced /aɪ/, therefore, <i> in 'liberate' should also be pronounced as /aɪ/. This shows that respondents had problem in the articulation of close front spread /ɪ/ in 'liberate' and 'women'. The table 6 below explains better.

The result also showed that out of 480 times when 'plait' and 'timbre' were pronounced, only 102 (21.2%) was recorded as the correct elicitation. This shows that respondents found it difficult to articulate front open spread /æ/ correctly instead they pronounced it as [ei] or [i] as the case may be. In other words, they pronounced them as [pleit] and [timba] instead of /ˈplæt/ and /tæmbə/. This could be as a result of over generalisation. Many respondents assumed that once the grapheme <i> in 'timber' is pronounced /ɪ/ (/tɪmbə/), therefore, the grapheme <i> in 'timbre' should also have the same pronunciation. See the table below for details.

It was revealed that out of 480 times when 120 respondents pronounced 'jeopardise' and 'meadow', only 154 frequencies of correct pronunciation was recorded which stood at 32.1% poor performance. This is an indication that respondents also found it difficult to correctly articulate the front half-open spread /e/ in 'jeopardy' and 'meadow' instead they pronounced it as [io], [ɛ] or [i:]. Analysis showed that 'jeopardise', and 'meadow' were pronounced as [dʒiopadaiz], [dʒɛpadaiz] and [mi:do] as the case may be instead of /ˈdʒepədaɪz/, /ˈmedəʊ/. The table below explains it better.

Table 6: Respondents' performance in the articulation of all the test items

Test items (2 in isolation + 2 in contexts = 4)	Respondents' Articulation				Correct and incorrect sounds	No. of Resp. (120) and total no of the test items' elicitations (4)
	Correct	Score (%)	Incorrect	Scores (%)		
veto, penalise	/ˈviːtəʊ/ /ˈpiːnəlaɪz/	70 (14.6%)	[vɛto], [pɛnalais]	410 (85.4%)	/iː/ → [ɛ]	120 x 4 = 480
liberation, women	/ˈlɪbəreɪt/ /ˈwɪmɪn/	90 (18.7%)	[laibireit], [wumɛn]	390 (81.9%)	/ɪ/ → [ai], [u], [ɛ]	
jeopardise, meadow	/ˈdʒepədaɪz/ /ˈmedəʊ/	154 (32.1%)	[dʒiopadaiz], [dʒɛpadaiz], [mi:do]	326 (67.9%)	/e/ → [io], [ɛ], [i:]	
plait, timbre	/ˈplæt/ /ˈtæmbə/	102 (21.2%)	[pleit], [timba]	378 (78.8%)	/æ/ → [ei], [i]	

Respondents' overall performance in the articulation of all the test items

The overall performance of the respondents in the test items comprises the correct and incorrect articulations. The table below presents a better illustration:

Table 7: Overall performance of respondents in the articulation of all the test items

Test items (2 in isolation + 2 in sentence = 4) 4 x 120 = 480	Front vowels (Tested	Respondents' Articulation scores				No of resp.
		correct	%	Incorrect	%	
veto, penalise	i:	70	**14.6**	410	85.4	120
liberate, women	ɪ	90	**18.7**	390	81.3	120
jeopardise, meadow	e	154	**32.1**	326	67.9	120
plait, timbre	æ	102	**21.2**	378	78.8	120
		416	**21.7**	1,504 Incorrect	78.3	

Total		Correct Articulation		Articulation		
Grand total (480x4=1,920)				**1,920**		

From the analysis explicated in the above table, out of 1,920 obtainable scores, the respondents scored 416 representing 21.7% as the correct articulation in the test items. Also, respondents scored 1,504 representing 78.3% as the incorrect articulation. Going by this overall performance (21.7%), it is obvious that respondents had a serious problem in the articulation of English words having front vowels and this is an impending problem which needs to be addressed in order to prevent communication impairment or barrier in the spoken English among the undergraduates of Federal University Wukari.

Respondents' performance in articulation of test items in words-in-isolation and sentence-contexts

This section reveals that the respondents' performances in the articulation of the four front vowels in the test items. The test items are categorised into two groups: the eight test items which include the 4 English front vowels are arranged in words in isolation, and the second group involves the same set of words but used in different sentence-contexts. The front vowels tested are /iː/, /ɪ/, /e/ and /æ/. Likewise, the words used include 'veto', 'penalise', 'liberate', 'women', 'plait', 'timbre', 'jeopardise', and 'meadow'.

The study equally showed the performance of the respondents in the articulation of the test items based on words-in-isolation and sentence-contexts. The correct articulation of the respondents stood at 21.7%. Out of the total obtainable scores of the correct articulation of 416 (21.7%), their performance in words-in-isolation was 281 (14.6%) while those in sentence-contexts was 135 (7.1%). Despite the overall performance of the respondents which was very poor, respondents performed in the articulation of the front vowels in words-in-isolation than in sentence-contexts. The table below explains better:

Table 8: Respondents' performance in words-in-isolation and sentence-contexts

Test items	Front vowels (Tested sounds)	Respondents' Articulation scores				No of resp.	No. of times test items articulated (480)
		Isolation 2 test items in words-in-isolation x 120 resps = **240**		**Sentence Contexts** 2 test items in sentence-contexts x 120 resps = **240**			
		Correct articulation	**%**	**Correct articulation**	**%**		
veto, penalise	iː	55	**11.5**	15	**3.1**	120	480
liberate, women	ɪ	52	**10.8**	38	**7.9**	120	480
jeopardise, meadow	e	90	**18.8**	64	**13.3**	120	480
plait, timbre	æ	84	**17.5**	18	**3.7**	120	480
Total		281 Correct Articulation	**14.6**	135 Correct Articulation	**7.1**	120	**1,920**
Grand total		416 (**21.7%**)					**1,920**

As show above, respondents performed better in words-in-isolation than in sentence-contexts; that is 281 (14.6%) against 135 (7.1%) as the correct articulation. The reason that could be attributed for the respondents' higher performance in isolation is connected to their inability to use context clues in determining the correct articulation while reading. As a result of the few number of English front vowels

used in some of the words in the sentences, the respondents found it difficult to guess or determine which of the test items was the focus of the research. We also discovered that they had almost finished reading the sentences before realising that the front vowels were the focus of the research. Unlike in the test items in isolation, the respondents were quick to recognise the focus of the research and they became conscious in their productions of the vowels. The two figures below will clearly show the difference:

Fig. 6: Bar chart showing overall respondents' performance in sentence-contexts and words-in-isolation
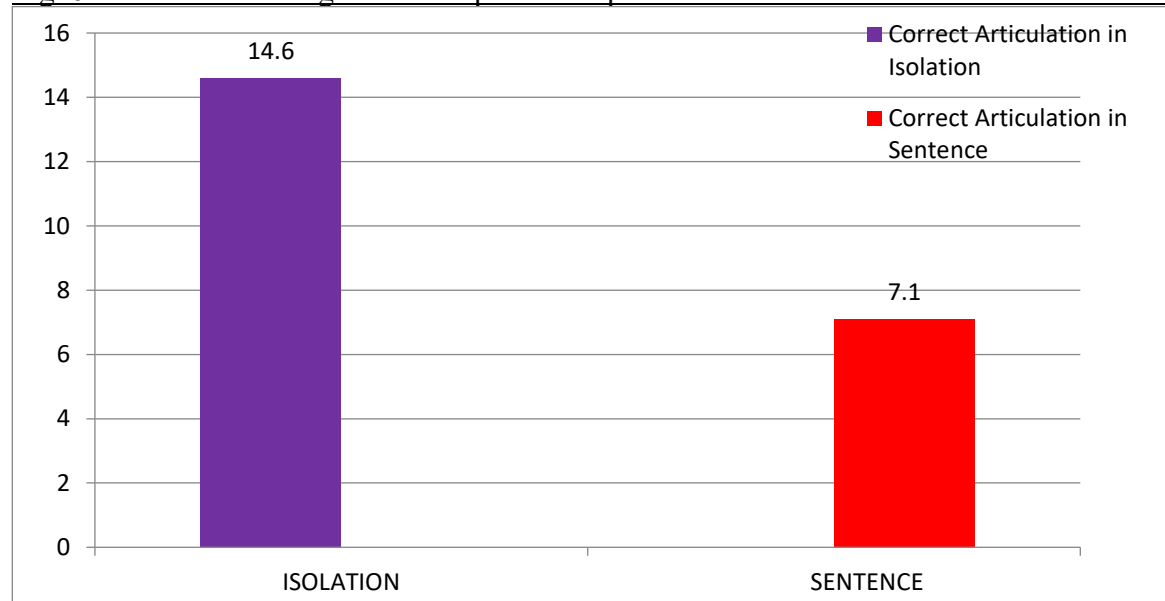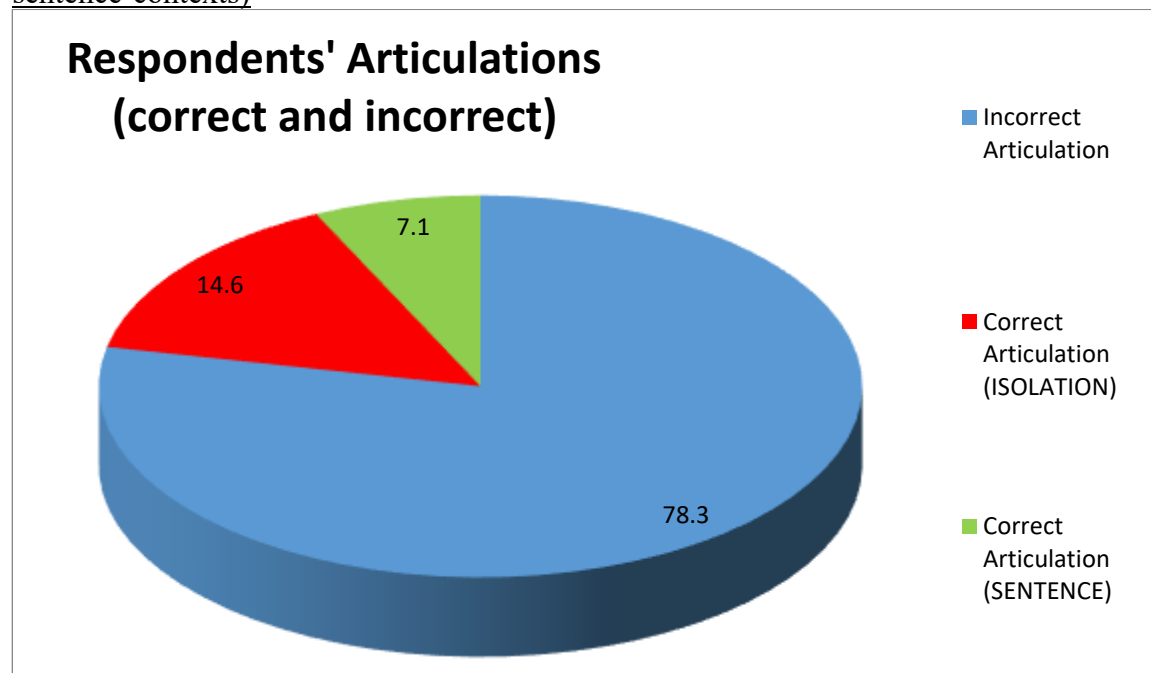

Fig.7: Pie chart showing overall percentages (correct & incorrect articulations / words-in-isolation & sentence-contexts)

The test items posing more difficulties to the respondents

This section is concerned with the test items that posed more difficulties to the respondents. However, based on the analysis earlier presented, it is obvious that all the four front vowels posed difficulties to the respondents with poor performance of front close spread /i:/ having 14.6%, front half-close spread /ɪ/ having 18.7%, front half-open spread /e/ with 32.1% and front open spread having 21.2% respectively.

Conclusively, respondents found the four front vowels really difficult to articulate correctly thereby they pronounced 'veto', 'penalise', 'liberate', 'women', 'jeopardise', 'meadow' 'plait', and 'timbre' as [vɛto], [pɛnalais], [laibireit], [wumɛn], [dʒiopadaiz], [mi:do:], [pleit], and [timba] instead of /ˈviːtəʊ/, /ˈpiːnəlaɪz/, /ˈlɪbəreɪt/, /ˈwɪmɪn/, /ˈdʒepədaɪz/, /ˈmedəʊ/, /ˈplæt/, and /ˈtæmbə/. They found it difficult to articulate these sounds both in sentence-contexts and also in words-in-isolation. This could be as a result of lack of special training from a well-trained phonetician/phonologist or lack of interest in learning English sounds system.

Semantic implications of the test items

The semantic implications of this research can be viewed in two perspectives. Firstly, it does not really affect communication. On the other hand, it can also cause communication breakdown.

Considering the former, mispronunciation of some of these test items may not really affect the overall meaning of the sentence in a context. In other words, once there is a mutual intelligibility among interlocutors (speaker and hearer), even if some of the words were not correctly pronounced but with the aid of contextual domain where the statement is said, the hearer can easily decode what he/she wanted to say or pronounce. For instance, if Mr Y reported to Mrs Z that, "The colonel warned his army against any form of scourge". Unconsciously, Mr Y mispronounced 'colonel' and 'scourge' as [kɔnɛl], and [skɔ:dʒ] intead of /ˈkɜːnəl/ and /skɜːdʒ/. As a result of the contextual make-up of the statement, Mrs Z can quickly decode and predict what he/she was supposed to pronounce. Mrs Z will quickly comprehend that Mr Y wanted to say /ˈkɜːnəl/ and /skɜːdʒ/, not [kɔnɛl], and [skɔ:dʒ]. In this scenario, the message will still be successfully passed across although there was mispronunciation.

Likewise, mispronunciation of word(s) in a sentence can cause a communication or semantic-breakdown as well when meaning is affected. For instance, if a teacher asked his student thus: "Please explain what timbre means". If the word 'timbre' is not correctly pronounced, the intended meaning of the speaker might not be unfolded. Instead of the speaker or teacher saying: [tæmbə] but ended up saying/pronouncing: [tɪmbə]. This shows that the right question has not been asked which means communication has not taken place. Here, *timbre* [tæmbə] and *timber* [tɪmbə] mean different things: 'timbre' /tæmbə/ means 'the quality of the sound made by a particular voice or musical instrument' while 'timber' [tɪmbə] denotes 'wood, plank or log'. Conclusively, the semantic implications of these mispronunciations include complete and partial communication break-downs as illustrated above. Therefore, there is a need to solve this problem.

Summary

The purpose of this research is to carry out the phonological analysis of English front vowels in the spoken English of selected undergraduates of Federal University Wukari. The researcher used a random sampling of one hundred and twenty (120) respondents (60 male and 60 female). They were randomly selected and were meant to read aloud the test items comprising English four front vowels in sentence-contexts and in words-in-isolation and the reading was recorded using a sound recorder device. Simple percentage was used to analyse the data.

From the results, it was discovered that many undergraduates of Federal University Wukari had difficulties in the articulation of the English front vowels which include /iː/, /ɪ/, /e/, and /æ/ in test items. As a result of their difficulties in the articulation of the front vowels, they pronounced 'veto', 'liberation', 'timbre', and 'jeopardise' as [vɛto], [laibireɪʃən], [timba], and [dʒɛpadaiz] instead of /ˈviːtəʊ/, /lɪbərˈeɪʃən/, /ˈtæmbə/, and /ˈdʒepədaɪz/ respectively, thereby pronouncing /iː/ as [ɛ]; /ɪ/ as [ai], [u], [ɛ]; /e/ as [io], [ɛ], [iː]; and /æ/ as [ei], [i] respectively.

It was discovered that female students performed better than their male counterparts with total score of 220 (33.3%) out of 960 against their male counterparts that recorded 196 (20.4%).

It was revealed that out of the total obtainable scores of 160, the respondents from English Department scored 92 (57.5%) which is above average against their counterparts in other departments especially respondents from the Department of Medical Laboratory Science with a poor score of 10 (6.3%).

The result also revealed that those with high level of interest (interested) recorded 43.8% which is above forty percentage pass mark, having an upper hand over their counterparts with little level of interest (fairly interested) which recorded 23.9% poor performance and those without interest (not interested) with very poor performance 18.8%.

It was discovered in the overall performance of the respondents' articulation of all the test items that, out of overall total 1,920 obtainable scores, the respondents scored only 416 representing 21.7% as the correct articulation in the test items. This revealed that respondents had problems in the articulation of English words having front vowels.

It was revealed that all the four front vowels (/iː/, /ɪ/, /e/, /æ/) tested posed difficulties to the respondents while pronouncing them. This is evident in the close poor performance of front close spread /iː/ as 14.6%, front half-close spread /ɪ/ having 18.7%, front half-open spread /e/ with 32.1% and front open spread having 21.2% respectively.

The study equally showed the performance of the respondents in the articulation of the test items based on words-in-isolation and sentence contexts. It was discovered that out of the total obtainable scores of the correct articulation of 1,920, respondents performed better in words-in-isolation than in sentence-contexts; the respondents' performance in isolation stood at 281 (14.6%) while sentence-contexts was 135 (7.1%) as the correct articulation. Conclusively, it was found out that the semantic implications of these mispronunciations included complete and partial communication break-downs.

CONCLUSION

The study covered the impending phonological problem of the articulation of the front vowels by randomly selected respondents, taking cognisance of their performance based on their sex, departments, and levels of interest in learning oral English accordingly. Based on the findings, it was discovered that the respondents' performance in the articulation of the front vowels both in context and word-in-isolation was not up the expected average or above-average percentage, but their score was very poor as the overall score stood at 416 (21.7%). This is to show that respondents had problems in the articulation of English front vowels. However, further research could be focused on the analysis of the central and back vowels in the spoken English of selected Nigerian speakers of English.

RECOMMENDATIONS

In line with the research findings made in this exercise, the researcher wishes to recommend the following. In the first place, students should not confine themselves to only checking the meaning of words and the use of words in the dictionaries but also check the accurate transcription and pronunciation of such words. Furthermore, they can as well install Phonetizer applications in their handy gadgets or mobile phones. In addition, there should be a periodic conference, workshops and seminars to improve the undergraduates' pronunciation patterns so as to alleviate them from the interference of their MTs. More so, a special training in phonetics and phonology should be given to the undergraduates especially those from ELS Department, since they will be the ones to teach other students. Moreover, the government should provide good, modern and standard language laboratories, libraries and other facilities so as to encourage the students and also increase their levels of interest in learning English sound systems.

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