Analyzing the Difficulties Encountered by Sudanese Arabic Native Speakers in Pronouncing English Consonant Clusters: A Case Study of English Teaching Staff at Some Sudanese Universities

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Abstract:

This study aimed at investigating the difficulty of pronouncing English consonant clusters encountered by universities teaching staff of English who are Sudanese native speakers of Arabic (SNSA). The researcher assumed that there are difficulties of pronouncing English clusters among SNSA learners of EFL. The study followed descriptive analytical method in order to elaborate and analyze the cause of the problem via statistical analysis of the gathered data. To obtain the necessary data for the study, the researchers designed a diagnostic test consisting of some phrases / sentences that confined to the research questions and hypotheses, to be audio-recorded. Accordingly after the necessary data were collected, the data were statistically calculated and computed by means of percentage. Based on the analysis and the results obtained, the study reveals that there is difficulty among SNSA, learners of English as foreign language in pronouncing English consonant clusters especially at initial and medial ones.

Key words: *Pronunciation, Consonant clusters, Teaching Staff, Syllabic structure, Sudanese Arabic Native Speakers.*

المستخلص:

هدفت الدراسة إلى تقصى صعوبات نطق (clusters) الحروف الساكنة عند إلتقاء أكثر من حرف ساكن فى اللغة الانجليزية لدى السودانيين الناطقين باللغة العربية لغة أولى ، افترض الباحثان أن هنالك مشاكل نطق الحروف الساكنة المتتالية فى اللغة الانجليزية لدى عينة البحث، واتبعت في ذلك المنهج الوصفي التحليلي لتوضيح المشكلة وتحليلها، وتكونت عينتها من بعض أساتذة الجامعات الذين يدرسون الإنجليزية لغةً أُجنبية في بعض الجامعات السودانية بولاية الخرطوم ، وقد اختيرت العينة عشوائياً للحصول على البيانات اللازمة باستخدم الاختبار التشخيصي وسلية للدراسة، حيث أعد الباحثان اختباراً تشخيصياً يحتوي على جمل قصيرة تتوافق مع اسئلة و فرضيات الدراسة ، على أن تقرأ بصوت يسمح بتسجيلها بواسطة جهاز التسجيل الصوتى ، و بناء على ذلك جمعت البيانات المطلوبة ومن ثم تحليلها ولحصائها عن طريق النسبة المئوية ، استنادا على التحليل و النتائج أظهرت الدراسة أن هنالك صعوبات لدى الأساتذة الناطقين باللغة العربية لغة أولى ، عند إلتقاء أكثر من حرف ساكن فى اللغة الانجليزية.

1. Introduction

Arabic and English languages are entirely two distinct in their linguistic systems. Both languages have differences in common, such as in phonology, morphology, syntax and semantics. The phonological system of English is accordingly different from that of Arabic language. Once we have two different phonological systems between two languages this might lead us to difficulty in pronunciation. That is why pronunciation of a foreign language

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is affected by different factors which make it difficult to master. All around the world learners of English as ESL or EFL want to have a good command of English pronunciation because English language pronunciation is a prominent element of language learning so, it's essential for all learners of English language to have good pronunciation. Accordingly SNSA learners of English are expected to have difficult in English pronunciation. Thus the subject of the study is that SNSA learners of English generally have difficulty in pronunciation and especially English consonant clusters, due to differences between the two sound systems of English and Sudanese Arabic (SA). English and Arabic/SA have differences in consonant clusters and as well as syllable structure.

2. Problem of the study

Due to the differences between the languages i.e.; English and Arabic/SA, SNSA are expected to have some difficulties in pronouncing English clusters. The study intends to investigate the difficulty of English consonant clusters pronunciation that faces universities teaching staff who are native speakers of Arabic. Pronouncing English clusters is considered one of the most challenging tasks that SNSA experienced.

The researchers assumed that SNSA encountered difficulty in pronouncing English consonant clusters in their speech.

3. Literature review

According to Oxford Dictionaries, syllable is a unit of pronunciation having one vowel sound, forming the whole or a part of a word. No phonetician has succeeded so far in giving an adequate explanation of what the syllable is. Roach (2009) described a syllable as consisting of a center (nucleus) which has no obstruction to airflow and which sound comparatively loud; before (onset) and after (coda) this center there

will be greater obstruction to airflow and/or less loud sound.

Consonant clusters are generally related to syllable structure in which consonants occur before and after the center (vowel). Consonant clusters are generally defined by the scholars; Verma & Krishnaswamy (1996), Balasabramanian (2000) and Roach (2009), as sequences of two or more consonants at the beginning or at the end of syllable. They believe that the vowel sound is obligatory element in the nucleus of the syllable.

Comparing of English and Arabic consonant clusters systems

In linguistic a consonant cluster is a group of two or more consonant sounds before or after a vowel sound at initial, medial or final position. Yule (2010) claims that English can actually have larger onset clusters; maximum number is three consonants (CCC-) in which the first consonant must always be /s-/, followed by voiceless stops /p, t, k/ and a liquid or glide /l, r, w, j/ as in 'spl*ash'* /spl-/*, '*spr*ing'* /spr-/*, '*str*ong',*/str-/ '*scr*eam'*/skr-/ and '**squ*are'*/skw-/. Similarly, Pearce (2007) argues that certain phonotactic rules govern the ways in which consonant clusters are formed. He adds that the permissible of two-item initial consonant are from 33 to 46 and there are only five three-item initial. Yule and Pearce believe that syllable-final clusters of two, three, and four items are allowable in English language. So we might expect from this combination of consonants, some restrictions on which consonant can combine to create these consonant clusters. Jackson (1980) summarizes the permissible of consonant clusters as follows:

- **Syllable-initial two-consonant clusters.**

There are, therefore, 26 two-consonant clusters in English: /sm/; 'smoke' , /sn/; 'snap' , /st/; 'stay', /sw/; 'sweet' , /sk/; 'sky' , /sl/; 'slow',

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/sp/; 'spell', /sf/; 'sphere' , /θw/; 'thwart', /dw/; 'dwell' , /tw/; 'twin' , /θr/; 'through' , /dr/; 'dream' , /tr/; 'tree' , /kw/; 'quick' , /kr/; 'cry' , /kl/; 'color' , /pr/; 'priest' , /fr/; 'fry' , /br/; 'bring' , /gr/; 'green' , /pl/; 'play', /fl/; 'fly', /bl/; 'blue', /gl/; 'glimpse' and /ʃr/; 'shred'.

- Syllable-initial three-consonant clusters.

In CCCV syllables the restrictions are even greater. We see in the examples below that all allowable three-consonant clusters are **s-clusters**, i.e. the initial consonant is /s/. Further, in English language there are only five three-consonant clusters: /spl/; 'splash' , /spr/; 'spry' , /str/; 'street' ,/skr/; 'screw' and /skw/; 'squash'.

- Syllable-final two, three and four-consonant clusters.

As with clusters in syllable-initial position, there are limitations on which consonants may combine and in what order in syllable-final position. Unlike syllable-initial clusters, however, it is not easy to represent all allowable combinations diagrammatically. Suffice it to say that there are at least 48 allowable three-consonant clusters and around seven allowable four-consonant clusters in syllable-final position in English. The following are some examples of syllable-final clusters:

- VCC as in 'ant' /-nt/ , and the final syllable of the word 'present' /-nt/.
- VCCC as in; 'ants' /-nts/, and the final syllable of the word 'presents' /-nts/
- VCCCC as in; 'uncles' /-nklz/, and in 'prompts' /-mpts/.

One notable feature in various English dialects, speakers intend to reduce a word final cluster in which can affect the sound sequences this is so called consonant cluster reduction. It occurs when one consonant (or more) in a sequence of adjacent consonant is dropped as in the word 'text' /teks/. Consonant cluster reduction is defined by Lisa (2002), she says "consonant cluster reduction is a process in which the final consonant group or cluster, composed of two consonant sounds, is reduced to a single consonant sound.

Arabic language or SA, on the other hand, does not permit initial clusters in syllable-initial at all, but permits final clusters in syllable-final. All syllables in MSA begin with a single consonant and are open (ending with a vowel) or closed (ending with a consonant). They are six in number, CV, CVV, CVC, CVVC, CVCC, and CVVCC. A syllable in MSA does not begin with short or long vowel. Most of the Arabic modern dialects are divided into three groups, i.e.; VC-dialects, C- dialects and CV-dialects, by Kiparsky (2003).

- VC- Dialects includes most of the Arabic dialects spoken in the north and central of Arab Peninsula, and also includes some other dialects of eastern Libya and two groups of Egyptian dialects spoken in the eastern parts of the Delta and approximately to Asyut.

- C- Dialects are spoken in a large area in the north and west of Africa which are characterized by long consonants sequences which have been analyzed both as complex clusters and as sequences of syllable with consonant nuclei.

- CV- Dialects are spoken in Egypt (Middle and Upper Egypt to Asyut and Cairo), Saudi Arabia (Mecca) and some parts of Sudan.

The Kparsky's classification present in the salient differences of syllabification patterns in Arabic dialects. These differences of syllable structure can be summarized according to onset, nuclei and coda in which epenthesis plays a significant part in the case of consonant clusters. As is mentioned earlier that MSA allows not more than one C- at initial position and not two -CC at final position thus;

• in the two group ,VC- and C- dialects delete high vowels in initial position (open syllable) in

order to reduce even initial CiC- to CC- as in such words; /kilaab/ 'dogs', → /klaab/ , /ħimaar/ 'donkey'→ / ħmaar/.

• in medial position - CCC- clusters are broken up by epenthesis in which epenthesis occurs to the right of the un-syllabified consonant (CCC→CCiC, thus: /ʔult-lu/→ /ʔultilu/ 'I told him' Cairene dialect), and those in which epenthesis occurs to the left (CCC→CiCC, thus: /gilt-la/ → /gilitla/ 'I told him' Iraqi dialect). CCC→CCiC occurs in CV- dialects and CCC→CiCC occur in VC- dialects. C- Dialects simply drop the vowel in the corresponding case /jəktbu/ 'they write'.

• in final position -CC, clusters occur unstrictly only the two groups CV-dialects and C-dialects. They can be broken up by an epenthetic vowel under certain conditions that is according to style and dialect, fore examples; the MSA /kalb/ becomes /kalib/, /ʔakl/ 'food' becomes /ʔakil/. Halpern (2009) categorizes six structural syllable types of MSA that can be classified into three categories defined as;

• The first one is a light syllable which consists of a consonant in the onset followed by a short vowel sound, CV as in /wa/ 'and'. Light are always open.

• The second category is a heavy syllable; this category consists of both a consonant in the onset followed by a short vowel and a consonant in the coda, CVC as in /min/ 'from', /katabtu/ 'I wrote it'. This type of syllable is always closed.

• The third one is called a supper heavy syllable, this consist of a consonant followed by one or two vowels and one or two consonants, CVVC or CVCC as in, /nuum/ 'sleep' , /bint/ 'girl' respectively. This syllable occurs at the final position in open and closed syllable. Another example belongs to this type is the occurring of two identical consonants which (gemination)

this can be mentioned here by -GG. For example, /madd-a/ 'he stretches', this occurs when there '*shada*'.

• SA uses only the following syllable structure, CV, CVV, CVC, CVVC and CVCC, in such words as; /da/ 'this' /lei/ 'why', /bun/ 'coffee', /naam/ 'slept', and /dʒamb/ 'beside', respectively. the last syllabic structure, CVCC, happens when a word like /wakit/ used in such example /wakt-l-salaa/ 'time for praying' Thus, most of the words which have consonant clusters, -CC- at medial position or -CC final position, have no existence in SA. Therefore, avoiding or breaking the cluster is the only way in such cases by inserting a vowel sound (epenthesis). Fore examples; /wakit/ CVCVC (time), while the syllable structure of the same word in MSA is /waqt/ CVCC. Another example; /katil/, CVCVC (killing); while in MSA syllable structure of this word is /qatl/ this happens in the cases of clusters at final position (-CC). in some cases in words like /katab/ 'he / she wrote' (CVCVC) cluster takes place when the subject is 1ˢᵗ person plural as in; /katabna/ 'we wrote', or in expression of continuous as in /biktibu/, 'they are writing'. SA displays alternation maintenance of -CCC- medial clusters so -CCC- becomes -CiCC- or -CCiC- for examples, /kalibna/, 'our dog', /ʔasˀubru/ /ʔasˀburu/ 'be patient (plural)'. Thus, SA prominently displays both VC- and CV-epenthesis patterns.

4. Method of the Study

The researchers will use two major methods in this study: descriptive and analytical. A descriptive method is used to describe what exists at the present. The main characteristic of this method is that the researcher has no any control over the variables. He is only concerned about reporting what has happened or what is happening. On the other hand, analytical method

attempts to describe and explain why certain situation exist, by using facts or information already available, and analyzing these to make a critical evaluation of the material gathered.

Data collection

The research method requires gathering relevant data from different available sources by two means of data collection, i.e.; primary data and secondary data. By mean of primary data, the researcher tends to collect data from different sources such as books, journals, theses, etc. which are relevant to the study. The other mean of data collection is secondary data that can be gathered from, test, questionnaire, interview, recording and so on. This study in addition to primary data, audio-recoding will be used to collect the relevant data that related to the case-study in order to reach a complete understanding about the problem.

Tools of Data collection

The researchers will use a diagnostic test consists of 45 phrases, relating to the hypotheses of the study, to read aloud by the participants. In this sense the researcher will use Sony audio-recording to in order to help the researcher to clarify the difficulties face SLs of English in pronunciation of English. Audio-recording is one of the techniques of collecting data, so it's useful in linguistics, where the speech itself is the subject of analysis.

Sample of the Study

The sample of the study consists of 30 teaching staff ,as a case study, both including both sexes, and have been chosen randomly from five universities that is Sudan University of Science & Technology, University of Bahri, Omdurman Islamic University, University of Khartoum and Al-ahfad University for Women. All the samples of this study have been engaged in teaching English language at their universities. The sample of the study's qualifications, 13 Ph.D and 17 MA holders with average of experience between 3 to 20 years of teaching English at tertiary level. The researcher asked the 30 participants to read the 45 phrases/ sentences aloud and before involve in reading he asked them to have a look to the phrases / sentences to prepare themselves.

Procedures

The study test took place after all the necessary preparation were done, each of the participants read the whole 45 phrases/ sentences aloud, while at the same time of recording the researcher was holding the recording device few centimeter from the participant's mouth. Before the researcher started to listen to the recordings, he had already prepared necessary drafts needed to see the correct and incorrect pronunciations of the study test. The researcher first, made transcription to all the 45 phrases / sentences from the site https://tophonetics.com/ , this site lack to other features of transcription such as connected speech (assimilation, weak forms and elision). To fulfill these missing features the researcher applied these features according to the phonological rules of English language. Second, the researcher prepared a table consisted of two axes one was for the numbers of the participants, vertically arranged as; p1, p2, ……p30, and second one for the values of correct and incorrect pronunciations of the target sounds, horizontally. After all this was done, then the researcher started to listen carefully by repeating the target sounds several times using the of feature of backward, this feature helped the researcher to recognize whether the target sound is correctly or incorrectly pronounced. In addition to this and to make the study authentic the researcher put the draft of the 45 phrases/sentences transcription in front of him while listening to the recordings. After he completed the task of listening and reported the

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data and the information needed for the analysis, then he calculated the figures using the percentage; that means the figures were calculated and computed to see the percentage of correct and incorrect of the target sounds. The collected data and information were analyzed descriptively and statistically.

Reliability and Validity of the Test

In order to check the apparent reliability and validation of the test according to the formulation and explanation, the researcher showed the test to five of Ph.D. holders as referees who are specialized in the same area of the study and work in different universities. In this matter some of the referees made some valuable suggestions and others agreed were agreed that the test is suitable to the study. The researcher took seriously the suggestions and corrections of the referees and has applied to the test.

The test and were validated first by 5 of Ph.d holders of the field to insure that the test were formulated correctly for the study purpose. Pre-samples were presented to 10 of the study test to check validity and reliability of the test. The researcher calculated the validity statistically using the following equation:

$$Validity = \sqrt{Re\,liability}$$

The reliability coefficient for the measurement was calculated using (split-half) method. Reliability coefficient was calculated according to Spearman-Brown Equation as the following:

$$Reliability\ Coefficient = \frac{2 \times r}{1 + r}$$

r = Pearson correlation coefficient

Table (1): the statistical reliability and validity of the pre-test sample is about 10 of the study test.

	Reliability	Validity
correct	0.80	0.89
In correct	0.87	0.93
Overall	0.92	0.96

Source: The researcher from applied study (2018)

We note from the results in the table above, that the overall Reliability and Validity coefficients for the questionnaire are greater than (50%), and some of them are nearest to one. This indicates to the high validity and reliability of the answers, so, the study test is valid and reliable.
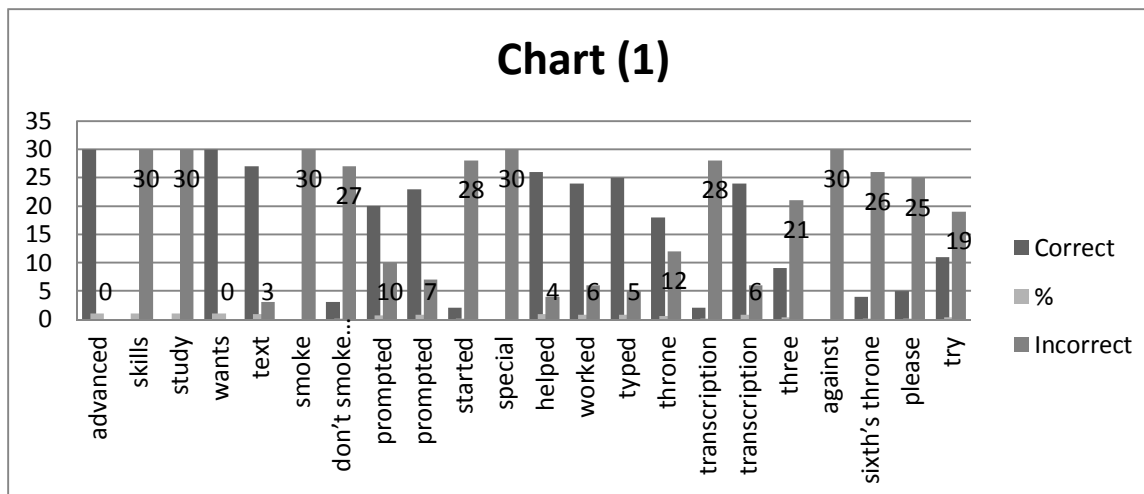
5. Statistical Analysis of the Data

The test targets the English assimilation that is different from Arabic assimilation. The results have been statistically analyzed and computed by means of percentage. The followings tables and figures show the results. The findings are explained and discussed accordingly.

Table (1): The frequency distributions of clusters pronunciation

Sentence No.	Target word/sound	Correct	%	Incorrect	%
9.	adva**nced**	30	100%	00	00%
9.	**sk**ills	00	00%	30	100%
10.	**st**udy	00	00%	30	100%
6.	wa**nts**	30	100%	00	00%
11.	te**xt**	27	90%	03	10%
12.	**sm**oke	00	00%	30	100%
12.	do**n't sm**oke /dəʊnt sməʊk/	03	10%	27	90%
13.	pro**mpt**ed	20	67%	10	33%
13.	**pr**ompted	23	77%	07	23%
14.	**st**arted	02	07%	28	93%
15.	**sp**ecial	00	00%	30	100%
16.	he**lped**	26	87%	04	13%
17.	wor**ked**	24	80%	06	20%
18.	ty**ped**	25	83%	05	17%
19.	**thr**one	18	60%	12	40%
20.	tra**nscr**iption	02	07%	28	93%
20.	**tr**anscription	24	80%	06	20%
23.	**thr**ee	09	30%	21	70%
28.	agai**nst**	00	00%	30	100%
38.	si**xth's thr**one	04	13%	26	87%
39.	**pl**ease	05	17%	25	83%
41.	**tr**y	11	37%	19	63%

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The table and the chart (1) show the frequencies of accuracy and incorrect pronunciation of 30 participants while pronouncing English consonants cluster. As seen from the table and the chart we can find that the consonants cluster occur at initial, medial, and final positions. Consonant clusters at initial position consist of maximum 3 consonants, this covers words that begins with pre-initial /s/ plus a consonant or two consonants such as; 'skills', 'study', 'smoke', 'started' and 'special'. These words have the typical participants' frequency of errors 30 (100%), except the word 'started' has 28 (93). Also it can be seen from the table and the chart above, words have two consonants at initial position such as; 'prompted', 'throne', 'transcription' 'three', 'please' and 'try' with participants' frequency of errors; 7 (23%), 12 (40%), 6 (20%), 21(70%), 25 (83%) and 19 (63%), respectively.

Consonants clusters at medial position includes the words as seen from the table such as; 'don't smoke', 'prompted', 'transcription', and sixth's
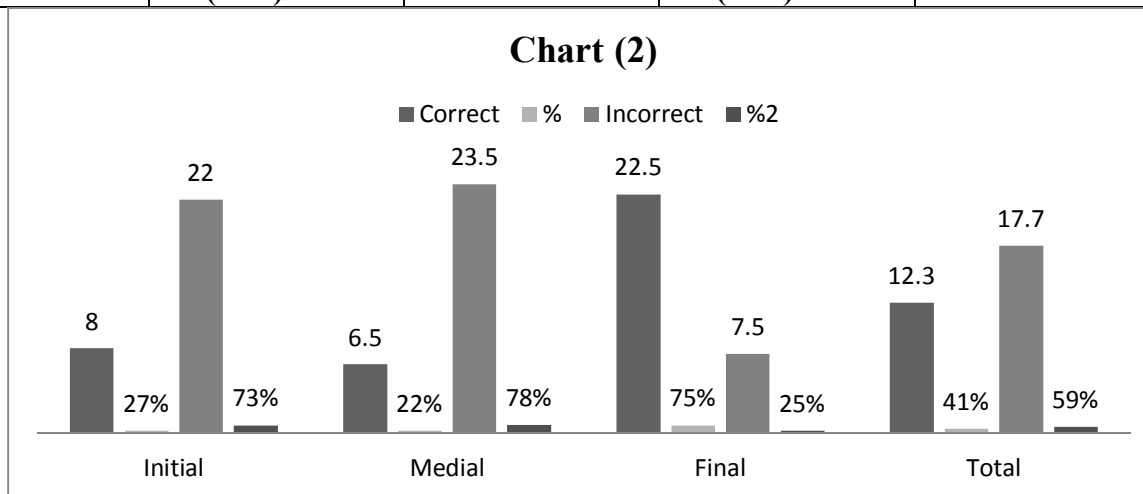
throne' with frequency of errors 30 (100%), 10 (33%), 28 (93%) and 26 (87%), respectively.

The table also displays another type of consonants cluster at the final position. As seen from the table the participants show accuracy in pronouncing this type of consonant cluster in words such as; advanced', 'wants', 'helped', 'worked' and typed but fail to show accuracy in the word 'against' with frequency of error 30 (100%).

The cause of participants' difficulty in pronouncing English cluster is that SA has consonants cluster at initial or final positions so clusters are broken up by inserting vowel sound /i/.While in final position SA cluster occurs un-strictly they can be broken up by an epenthetic vowel under certain conditions that is according to style.

The overall calculated value of the median for participants' correct pronunciation of the target sound above is 10 (33%) while it is 20 (67%) for participants' incorrect pronunciation.

6. Results and Discussion

Table (2): The value of median of clusters

Value	Correct	%	Incorrect	%
Initial	08	27%	22	73%

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Medial	6.5	22%	23.5	78%
Final	22.5	75%	7.5	25%
Total	**(37/3) 12.3**	**41%**	**(53/3) 17.7**	**59%**

Chart (2)

The table and the chart (2) represent the value of median of the participants' accuracy and errors when pronouncing English consonsnts cluster at initial, medial or final postions. Thus, the participants' accuracy as shown in the table is at initial show accuracy of (27%) at initial position, (22%) at medial position and (75%) at final position. This shows that the participants have difficulty when pronouncing English consonants cluster at medial and final positions with percentages of (78%) and (73%) respectively. Cosonants cluster at initial position is of two types, one is consist of pre-intial /s/ and one or two consonants and this type the participants tend to insert the vowel sound /i/ to break clusters and this is why because SA has no any consonants cluster at initial position. The other one is unlike the above one, is consist of two consonant without pre-intial /s/, in this type also the participants use to insert /i/ (see table (2). The percentage of the participants'error at final position is (25%) which is the lowest one among initial and medial consonants cluster. The highest percentage of accuracy shown in the

table and the chart is (75%), thus we can find out that the participants have no difficulty in pronouncing final consonants clusters, but have difficulty at initial and medial positions.

7. Conclusions

In conclusion we can say that SNSA (teaching staff) have difficulty in English pronunciation due to mother tongue interference. Referring to the results above, we find that the results support the hypothesis of the study in accordance with the results of the study test, showed that SNSA (teaching staff as case study) experience difficulty in English consonants cluster pronunciation. The results were confined with the theories of previous works on second language learning, such as; Avery & Ehrlich (1992), Swan & Smith (1987), Weinreich (1953), Whitman (1970), Fries (1945) and Lado (1957).

8. Recommendations

Based on the result and the findings of this study the researcher comes out with the following recommendations:

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1. Teaching staff should pay more attention of their pronunciation by trying to produce English speech sounds correctly in class rooms and try to avoid mother tongue interference.

2. Teaching staffs are advised to listen to English native speakers via listening to news, watching movies and so on, to improve their intelligibility for practicing pronunciation.

3. Teaching staff are advised to apply the phonological rules of English while speaking and do practice on it.

4. Future researchers should pay more attention on the difficulty of English pronunciation, especially the aspects of connected speech.

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