Dialect Phonemes Incorporated into the Standard Kadazandusun Language

Henry Bating, Loi Chek Kim, and Siti Aishah Ramli

Abstract—**The present study is an analysis of vocoid and contoid variation in Kadazandusun dialects and it has an implication for the teaching of standardized spelling and pronunciation of the Kadazandusun language in Malaysia. The study aims to analyze the phonemes of the Kadazandusun dialects in order to determine the phonemes and graphemes that have been incorporated into the standard Kadazandusun language. This paper uses the qualitative descriptive method of literature study. The sample comprises 10 dialects, namely Tatana, Lotud, Tangaa', Rungus, Kimaragang, Liwan (Tambunan), Murut Timugon, Murut Tagol, Tombonuo and Kolobuan. These dialects were selected from the three language families in Sabah, namely Dusunic, Murutic and Paitanic. A -dialectal analysis was performed on the segmental phonemic description and phonemes of each dialect to find common equation similarities that have provided a base for standardizing the phonemes and graphemes of the Kadazandusun language. The findings show that the Kadazandusun language has 36 phonemes comprising six vocals, seven diphthongs and 23 consonants. All the 36 phonemes are represented by 21 graphemes of Romanized letters. Other phonemes are denoted by diacritical signs and two vowel arrangements.**

Index Terms—**Dialect, grapheme, phoneme, vowel.**

I. INTRODUCTION

This study attempts to find the phonemes and graphemes incorporated into the standard Kadazadusun language from dialects in the following three language families namely, Dusunic, Murutic and Patanic.

When Kadazandusun language was first required to be taught in schools in Malaysia by the Ministry of Education, the Kadazandusun Cultural Association and United Sabah Dusun Association have set the Bundu, Liwan and Tangaa' as the three fundamental dialects of which their phonemes have been incorporated into the standard Kadazandusun language. In addition to the phonemes of three fundamental dialects (from the language family of Dusunic), the standard Kadazandusun language has been enriched by phonemes of other 40 dialects. These 40 dialects are from the three language families, namely (i) Dusunic, (ii) Murutic and (iii) Paitanic.

The research questions for this study are as follows:

(i) Based on the ten dialectical analysis, what are the phonemes and graphemes incorporated into the standard Kadazandusun language?

(ii) Do glottal stop signs ('), plosive b and plosive d signs need to be included as part of the alphabets?

Ten dialects were analyzed in this study. They are namely Tatana, Lotud, Tangaa' (Tangara), Rungus, Bundu (Kimaragang), Liwan (Tambunan), Murut Timugon, Murut Tagol, Tombonuo and Kolobuan. These dialects are selected based on the three core dialects (Liwan, Bundu and Tangaa') and other dialects from three language families, namely Dusunic, Murutic and Paitanic spoken by the community. Phonemes found in at least one of the sample dialects were identified as phonemes incorporated into the standard Kadazandusun language. On the basis of these phonemes, the grapheme and the standardized spelling and pronunciation of the Kadazandusum language were determined.

A. Theoretical Basis

Vowels are speech sounds that occur directly from the lungs to the lips and exits without experiencing any obstacles; at the same time, it does not cause any vibration to any supra-segmental tools. Consonants are sounds produced when the airway is obstructed from the lungs to the mouth by the larynx closure or forced through the narrow opening or moves from the center line of the groove through the lateral hole or causes in the vibration of supra-glottal tools [1].

Diphthongs occur when two vowel sequences exist in one syllable and usually denoted by two letters. The sound of two vowel sequences is not separated and produces the sonority which leads to the non-vowel element. Sonority changes involved the levels of the tongue, tongue movement and structure [2]-[4]. Phones are research objects in phonetic studies. Phones can be defined as the speech sounds that generally do not concern whether the sounds have a difference in meaning or not. On the other hand, phonemes are the objects of study for phonemic research. Phonemes can be defined as the speech sounds that can distinguish the meanings of words [2].

Graphemes are letters in the Roman alphabets. Each alphabet is a grapheme which is considered as the smallest unit of the distinctive writing system and represents the phonemes. In the Indonesian/ Malay spelling system, the correspondence between one phoneme and grapheme does not exist [5]. Spelling is the depiction of the language sound in the standardized written form. Standardization is usually carried out through phonological, morphological and syntactic analysis [6]. Spelling is an active language system in the society as a realization of communication between human beings which progresses from the oral symbols to visual symbols [7].

A standardized language is a language variation which can be considered to have a greater prestige than the other dialects in the same language. A standardized language has a systematic grammar and is capable of expressing broad

thinking. It is used in formal situations and spoken by educated people as well as used in the media [2], [4], [5]. In introducing an efficient spelling system, the spelling system should be able to represent the phonological system of a language. This step can be done using the symbols in the writing system that has been selected for the related language. The spelling system should also be able to accommodate any potential development features in the phonology system of the language [7].

However, [5] stated that two or more phonemes can only be denoted by one or two graphemes to represent a phoneme. In some cases, there is no one-to-one correspondence between phonemes and graphemes. To overcome this difficulty, [8] provided a single symbol for varied and ever-changing phonemes. Any variation and changes in any phonemes should not be accepted for separate symbolization. On the other hand, such phonetic variation should be written with one single symbol.

B. The Description of Vowel and Consonant Phonemes of Kadazandusun Dialects

The following describes the consonants and vowels of ten sample dialects as a comparative data. An analysis and interpretation are undertaken to determinate the letters for the standardization of Kadazandusun spelling and pronunciation.

1) Tatana dialect

Tatana dialect is spoken in Kuala Penyu District, which is located on the Klias Peninsula, southwest of the State of Sabah, Malaysia. The number of speakers of the Tatana dialect is about 5,500 people. The Tatana dialect has 17 consonants consisting of /p/, /t/, /k/, /'/, /b/, /d/, /g/, /s/, /dž/, /m/, /n/, /ɲ/, /ŋ/, /l/, /r/, /w/, /y / and four vowels, namely / i u o a /. The Tatana dialect has five diphthongs which include [ai], [au], [oi] and [iu] [9].

2) Lotud dialect

Lotud dialect is spoken in Tuaran District which is located about 32 kilometres to the north of Kota Kinabalu, Sabah. There are about 6,000 speakers of the Lotud dialect. Lotud dialect has 18 consonants comprising / p/, /t/, /k, /'/, /b/, /d/, /g/, /s/, /h/, /ḍ/, /m/, /n/, /ɲ/, /ŋ/, /l/, /r/, /w/, /y / and four vowels, namely / i u a ɔ /. Lotud dialect has five diphthongs that include [ai], [au], [ou], [iu] and [ui] [9].

3) Tangaa' (tangara) dialect

Tangaa' dialect is spoken in Penampang and Papar districts of Sabah. The two districts are located in southern Kota Kinabalu. Penampang is five kilometres from Kota Kinabalu, while Papar is 25 kilometres from Kota Kinabalu. Tangaa' dialect is spoken by about 40,500 people. Tangaa' dialect has 17 consonants comprise / p/, /t/, /k/, /'/, /b/, /ɓ/, /d/, /ɗ/, /g/, /m/, /n/, /ŋ/, /s/, /h/, /v/, /z/, /l / and four vowels, namely / i u o a /. The Tangaa dialect has five diphthongs including [ai], [au], [oi], [ou] and [iu] [10].

4) Rungus dialect

Rungus dialect is spoken in Kudat District of Sabah which is located in northern Sabah. It had been estimated that there are 6,000 Rungus dialect speakers. The Rungus dialect has 19 consonants comprising /p/, /b /, /t/, /d/, /k/, /g/, /q/, /m/, /n/, /ŋ/, /v/, /s/, /z/, /h/, /j/, /r/, /l/, /w/, /y/ and five vowels, namely / i e a o u /. Rungus dialect has six diphthongsincluding [ai], [au], [oi], [ou], [iu] and [ui] [11].

5) Kimaragang dialect

Kimaragang dialect is spoken in Tandek and Pitas districts. These two districts are in north eastern Sabah, Malaysia. Kimaragang dialect is spoken by about 10,000 people. The Kimaragang dialect has 18 consonants comprising /p/,/t/, /k/, /'/, /b/, /d/, /g/, /ɓ/, /ɗ/, /s/, /dž/, /m/, /n/, /ŋ/, /l/, /r/, /w/ /y/ and five vocals such as / i /u/ e /o/ a /. The Kimaragang dialect has six diphthongs includeing [ai], [au], [oi], [ou], [iu] and [uw] [12].

6) Liwan dialect (tambunan)

The Liwan dialect is spoken in Tambunan and Ranau. Tambunan is located in the inland area of Sabah while Ranau is on the west coast, at the foot of Mount Kinabalu. It is estimated that there are around 18,000 speakers of Liwan dialect. Liwan dialect has 17 consonants comprising / p/, /t/, /k/, /q/, /b/, /d/, /g/, /m/, /n/, /ɲ/, /ŋ/, /s/, /h/, /r/, /l/, /w/, /y / and five vowels such as / i u e o a /. There are seven diphthongs consisting of [ai], [au], [oi], [ou], [iu], [ui] and [uw] [11].

7) Murut timugon dialect

Murut Timugon dialect is spoken in Tenom district which is located in one of the rural southwest areas of Sabah. The Murut Timugon dialect is spoken by about 18,000 people. Murut Timugon dialect has 17 consonants comprising /p/, /t/, /k/, /'/, /b/, /d/, /g/, /j/, /m/, /n/, /ɲ/, /ŋ/, /s/, /l/, /r/, /w/, /y/ and four vowels, namely / i u o a /. Murut Timugon dialect has three diphthongs including [ai], [au] and [oi] [13].

8) Murut tagol dialect

Murut Tagol dialect is spoken at Kemabong, Tenom and Pensiangan areas in Nabawan District, Sabah. Kemabong is located south of Tenom while Pensiangan is in the southern part of the inland area of Kalimantan, Indonesia. The Murut Tagol dialect is spoken by about 13,000 people. The Murut Tagol dialect has 15 consonants comprising / p/, /t/, /k/, /'/, /b/, /d/, /g/, /h/, /s/, /m/, /n/, /ŋ/, /l/, /w/, /y / and four vowels, namely / i u o a /. The Murut Tagol dialect has four diphthongs, namely [ai], [au], [oi] and [ou] [14].

9) (ix) Tombonuo Dialect

Tombonuo dialect is spoken in the villages along Sungai Sugut, Paitan and Tangkarason in Pitas district and Beluran, Sabah, Malaysia. Beluran is located in northeast Sabah while Pitas is in northern Sabah. Tombonuo dialect is spoken by about 20,000 people. The dialect has 16 consonants comprising / p/, /t/, /k/, /'/, /b/, /d/, /g/, /s/, /dž/, /m/, /n/, /ŋ/, /r/, /l/, /w/, /y / and four vocals comprise / i u a o /. The dialect also has five diphthongs, namely [ai], [au], [oi], [iu] and [uw] [15].

10) (x) Kolobuan Dialect

The Kolobuan dialect is spoken in the Kinabatangan River which is located around the middle of the centerline of the geographic region in Sabah, Malaysia. Kolobuan dialect is spoken by about 5,000 people. The Kolobuan dialect has 15 comprising / p/, /t/, /k/, /'/, /b/, /d/, /g/, /s/, /m/, /n/, /ŋ/, /l/, /r/, /w/, /y / and four vowels such as / i u a o /. The Kolobuan dialect also has three diphthongs including [ai], [oi] and [iu] [16].

II. METHODOLOGY

The present study employed both the qualitative and quantitative methods. It described the phonemes identified

among the sampled dialects and quantified the occurrences of phonemes identified in the sample. The analysis was carried out using library research method, descriptive qualitative and the correspondent analysis of Phoneme-Grapheme. The phonemes that subjugate most of the ten sample dialects are considered as the standard phonemes of the Kadazandusun languages. The consonant identification is performed by matching the manner and place of articulation with the consonantal phonemes of the ten Kadazandusun dialects. This analysis is carried out by calculating the number of consonants of each dialect that employs the 25 manners and places of articulation. The analysis also involves the comparison of consonant, vowel and diphthong phonemes.

III. RESULTS AND DISCUSSION

Overall, there are 25 manners and places of consonant articulations in the list. Each consonant in Kadazandusun dialects is marked on the manners and places of articulation to indicate the total number of consonants in the dialects.

A. Identification of Similarities and Differences the Consonant Phonemes

Out of the 25 consonants identified, it is found that 23 consonants can be classified as the standardized phonemes of Kadazandusun consonants. The 23 consonants and their occurrences (as presented in parenthesis) are listed below.

The 23 consonants are consisted of namely (i) voiceless bilabial plosive /p/ (10), (ii) voiceless velar fricative /h/ (4), (iii)voiceless alveolar plosive /t/(10), (iv) voiceless velar plosive /k/ (10), (v) glottal stop /'/ (10), (vi) voiced bilabial plosive /b/ (10), (vii)voiced bilabial implosive /ɓ/ (1), (viii)voiced alveolar plosive /d/(10), (ix)voiced alveolar implosive /ɗ/ (1), (x)voiced velar plosive /g/(10), (xi)alveolar fricative /s/ (10), (xii)bilabial nasal /m/ (10), (xiii) alveolar nasal /n/ (10), (xiv)velar nasal /ŋ/(10), (xv)alveolar lateral /l/(10), (xvi)voiced alveolar /r/(9), (xvii)voiced labiodental fricative /v/(2), (xviii)bilabial semivowel /w/(9), (xix)palatal semivowel /y/(9), (xx)post-alveolar affricate /dž/(5), (xxi)palatal nasal /ɲ/(4), (xxii)voiced alveolar fricative /z/(2), and (xxiii)palatal semivowel /j/(2).

The classification of these consonant phonemes is based on the phonemic acceptance in at least one of the 10 dialects analyzed. The glottal fricative /h/ and the voiceless velar fricative /h/ are pronounced using the same manner of articulation (fricative) but using different places of articulation (glottal vs. velar). In this finding, the glottal fricative /h/ is not selected as the phoneme incorporated into the standard Kadazandusun language because its frequency is lower than that of the voiceless velar fricative /h/ (1 vs. 4). On the other hand, the consonant voiceless post-aveolar affricate/ ʧ / phoneme is pronounced using the same manner and place of articulation as the voiced post-alveolar affricate /dž/ but they are different in voicing. As they share the same manner and place of articulation (i.e. post-aveolar Affricate), only one of them has been identified as the phoneme incorporated into the standard Kadazandusun language. The selected phoneme is the voiced post-alveolar affricate /dž/ as it has a higher frequency compared to that of voiceless post-

aveolar affricate/ ʧ / (5 vs. 1).

Therefore, out of the 25 consonants, these two consonants namely, (i) glottal fricative /h/ and (ii) voiceless post-aveolar affricate /ʧ/ are not classified under the phonemes incorporated into the standard Kadazandusun language.

B. Identification of Vowel Phonemes Similarities and Differences

The identification of vowel phonemes' similarities and differences of the ten vowel phonemes of the Kadazandusun language dialect is performed by matching the position of the tongue with the vowel phonemes of each dialect. There are 13 tongue positions according to the human speech organs with the vowel phonemes of each dialect. The analysis is carried out by calculating the number of phonemes of each dialect that occurs at the 13 tongue positions. Out of the 13 identified phonemes, six vowels can be classified into the Kadazandusun vowel standard phonemes comprising /i/, /a/, /u/, /e/, /o/ and /ɔ/. The classification of the vowel phonemes is based on the acceptance of the vowel phonemes in at least one of the 10 dialects analyzed. These six phonemes are accepted by taking into account on the speech differences among the vowel phonemes /i/, /a/ and /o/ phonemes. The vowel phoneme /i/ is pronounced with the high-front and high non-rear tongue position. The vowel phoneme /a/ is pronounced with low non-rear, low-front and mid central (short) tongue position. Then, the vowel phoneme /o/ is pronounced with mid-central, mid-back and mid-back tongue position.

C. Identification of Diphthong Similarities and Differences

The identification of the similarities and differences for diphthong phonemes of the ten Kadazandusun language dialects is performed by matching between the seven phonemic diphthongs with diphthongs of each dialect. The analysis is carried out by calculating the number of diphthong in each dialect that contains each of the seven diphthong phonemes.

Out of the seven phonemic diphthongs identified, it is found that these seven phonemes occur in at least three of the ten Kadazandusun dialects. The seven diphthongs are /au/, /ai/, / ou/, /oi/, /iu/, /ui/ and /uw/. Diphthongs in Kadazandusun language consist of the rising diphthongs and falling diphthongs. The rising diphthongs are /au/, /ai/, /ou/, /oi/, / ui / and /uw/; while the falling diphthong is /iu/.

D. Kadazandusun Language Phonemes

Based on the result of identification of the Kadazandusun language phonemes analysis on the 10 dialects, it is found that the Kadazandusun language has 36 phonemes consisting of 23 consonant phonemes, six vowel phonemes and seven diphthong phonemes.

Twenty-three consonants comprise (i) voiceless bilabial plosive /p/, (ii)voiceless velar fricative /h/, (iii)voiceless alveolar plosive /t/, (iv)voiceless velar plosive /k/, (v)glottal stop /'/, (vi)voiced bilabial plosive /b/, (vii)voiced bilabial implosive /ɓ/, (viii)voiced alveolar plosive /d/, (ix)voiced alveolar implosive /ɗ/, (x)voiced velar plosive /g/, (xi)alveolar fricative /s/, (xii)bilabial nasal /m/, (xiii)alveolar nasal /n/, (xiv)velar nasal /ŋ/, (xv)alveolar lateral /l/, (xvi)voiced alveolar /r/, (xvi)voiced labiodental fricative /v/, (xviii)bilabial semivowel /w/, (xix)palatal semivowel /y/,

(xx)post-alveolar affricate / dž/, (xxi)palatal nasal /ɲ/, (xxii)voiced alveolar fricative /z/, and (xxiii)palatal semivowel /j/.

Meanwhile, the six vowels comprise namely (i) high-front / i/, (ii) mid-low /a/, (iii) high-back /u/, (iv) mid-front /e/, (v) mid-back /o/ and (vi) mid-central /ə/. In addition, the seven diphthongs are namely (i)/ au/, (ii) /ai/, (iii) /ou/, (iv) /oi/, (v) / iu/, (vi) /ui/ and (vii) /uw/.

E. Kadazandusun Language Grafem (Alphabet)

Kadazandusun language uses the Roman alphabets Aa, Bb, Cc, Dd, Ee, Ff, Gg, Hh, Ii, Jj, Kk, Ll, Mm, Nn, Oo, Pp, Qq, Rr, Ss, Tt, Uu, Vv, Ww, Xx, Yy, Zz. Based on the results of the consonant and vowel phonemes of the ten Kadazandusun dialects, the Kadazandusun language phonology system can be represented by the letters Aa, Bb, Dd, Ee, Gg, Hh, Ii, Jj, Kk, Ll, Mm, Nn, Oo, Pp, Rr, Ss, Tt, Uu, Ww, Yy, Zz. Meanwhile, the other five letters Cc, Ff, Qq, Vv and Xx do not have any relation to the Kadazandusun language phonology system. However, these five letters should continuously be included in the Kadazandusun language alphabet to accommodate any development features and the integration of foreign language words.

The six vowels in Kadazandusun language are symbolized by five letters, namely /i/ as <Ii>, /u/ as <Uu>, /e/ as <Ee>, / o/ and /ɔ/ as <Oo> then /a/ as <Aa >. Twenty-three consonants are symbolized by 16 letters comprising /b/ and / ɓ/ as <Bb>, /d/ and /ɗ/ as <Dd>, /g/ as <Gg>, /h/ as <Hh> / j/ and /dž/ as <Jj>, /k/ as <Kk>, /l/ as <Ll>, /m/ as <Mm>, / n/ as <Nn>, /p/ as <Pp>, /r/ as <Rr>, /s/ as <Ss>, /t/ as <Tt>, /w/ as <Ww>, /y/ as <Yy> then /z/ as <Zz>. Diphthongs are not included in the symbolism of these alphabets. Furthermore, the voiced bilabial plosive /b/ is not symbolized by a special letter <b> because voiced bilabial plosive /b/ and voiced bilabial implosive /ɓ/ are symbolized by the same letter <b>. The voiced alveolar plosive /d/ is also not symbolized by a special letter <d> because the voiced alveolar plosive phoneme /d/ and voiced alveolar implosive /ɗ / are symbolized by the same letter <d>. Glottal stop phonemes / ʼ/ are also not symbolized by a special letter <ʼ > because <ʼ > is only a diacritical mark that does not exist in the alphabets of Roman letters.

IV. Conclusion

The spelling and writing system of Kadazandusun language use the Roman alphabetic letters <Aa, Bb, Cc, Dd, Ee, Ff, Gg, Hh, Ii, Jj, Kk, Ll, Mm, Nn, Oo, Pp, Qq, Rr, Ss, Tt, Uu, Vv, Ww, Xx, Yy, Zz>. The alphabets that symbolize the 36 Kadazandusun phonemes consist of 23 consonant phonemes, six vowel phonemes and seven phonemes. The five letters which are <Cc, Ff, Qq, Vv and Xx> are maintained in the alphabetical line even though they have no relation to the Kadazandusun language phonology system. This is to accommodate any possible integration of foreign language words and development features of the sound system in the future.

The Primary School Standard Curriculum (KSSR) of the standard Kadazandusun language however includes 39 compared to the 36 Roman alphabets (graphemes) found in the present findings. The three additional alphabets are, namely plosive <b>, plosive <d> dan glottal stop <ʼ > [17].

<b> represents the voiced bilabial plosive /b/; <d> represents the voiced alveolar plosive /d/ and <ʼ > represents the glottal stop / ʼ/.

The present study suggests that these three graphemes are redundant as both the voiced bilabial plosive /b/ and the voiced bilabial implosive /ɓ/ are denoted by the same <b> and both the voiced alveolar plosive /d/ and the voiced alveolar implosive /ɗ / are denoted by the same <d>.

In other words, the results of the analysis show that /b/ and /ɓ/ should be denoted only by the same grapheme <Bb>, /d/ and /ɗ/ should be denoted only by the same grapheme <Dd>, while <ʼ> should not be denoted by any letter because it is simply a diacritical mark and not a letter in Roman alphabets.

The consonants, vowels, diphthongs and letters produced in this analysis have been used as the basis of the standard Kadazandusun language writing and spelling system. The results of this analysis also imply that the standard Kadazandusun language employed in schools includes dialectical phonology in Dusunic, Paitanic and Murutic dialects. As for the phonological aspect, the standard Kadazandusun language is also enriched with dialect vocabularies of the three language families.

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