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Research Paper

A Contrastive Analysis of English and Kanuri Vowels: Implication for EFL Pronunciation

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Abstract

This study first compares the vowel phonemes of English and Kanuri languages; second, investigates the influence of Kanuri phonology on the realisation of English vowel phonemes by native Kanuri speakers in Bama, Borno State, Nigeria. It adopts a two-stage methodology: first, a literature-based comparative analysis of the English and Kanuri vowel systems, and second, an empirical phonetic analysis based on primary speech data collected from adult Kanuri speakers. The findings reveal significant patterns of L1 interference shaped by structural asymmetries between the two languages. English vowel length contrasts are frequently neutralised due to the absence of vowel length in Kanuri, while central vowels such as /ʌ/ and /ɜː/ are replaced with the closest Kanuri equivalents. Diphthongs are commonly simplified or broken with epenthetic segments. These results confirm the study's hypotheses and highlight the role of phonemic gaps, articulatory constraints, and orthographic influence in shaping second language vowel production. The study contributes to a deeper understanding of cross-linguistic phonological transfer and offers pedagogical insights for pronunciation instruction among Kanuri-speaking learners of English.

Keywords: *Kanuri-English Vowels, Kanuri Native Speakers, Phonological Features, L1 Interference*

INTRODUCTION

This study examines the segmental phonological relationship between English and Kanuri, focusing on the vowel systems of both languages. By identifying the structural similarities and differences between their phoneme inventories, the study aims to predict and analyse patterns of L1 interference in the English spoken by Kanuri native speakers. Although extensive phonological studies exist for English, Kanuri remains under-represented in contrastive linguistic research. This study contributes to filling this gap by providing both theoretical and empirical insights. The paper is structured in two parts. The first presents a literature-based comparative analysis of the vowel phonemes of English and Kanuri. The second part examines primary data collected from native Kanuri speakers to test the English vowel realisation predictions derived from the initial comparison. The lexical sets developed are used to provide the segmental description of the Kanuri-English in the subsequent sections. The use of Wells' lexical sets does not denote that the variety is regarded as 'deviation' from, or imperfect attempts to emulate, RP, from which the lexical sets derive, but the Wells scheme is simply used as an accepted descriptive framework for reference.

The English Language

English, a non-agglutinative Indo-European language of the West Germanic subgroup, has evolved through historical contact with Germanic, Latin, and Romance languages (Hogg & Denison, 2006). Its phonological system comprises a rich array of vowel phonemes, which are often challenging for L2 learners whose L1 lacks such features. Modern English is currently widely used

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in many parts of the world. It has distinct varieties spoken in different countries; this includes British English (English, Scottish English and Welsh English), American English, Canadian English, Caribbean English, Australian English, Hiberno English, Indo-Pakistani English, New Zealand English, Nigerian English, Philippine English, Singaporean English as well as South African English (Lass, 1987).

The Kanuri Language

Kanuri is a Chadic language spoken by over three million people in the Lake Chad region, with its largest population in northeastern Nigeria (Bulakarima & Shettima, 2012). It is a tonal language, exhibiting high, low, rising, falling, and occasionally mid tones. Phonologically, Kanuri has a relatively small inventory of vowels. Six major dialects exist: Yerwa, Bilma, Mowar, Suwurti and Manga, among which the Yerwa dialect is the most widely spoken.

Research Questions

This study also addresses the phonological relationship between the vowel systems of English and Kanuri, aiming to explore how differences in vowel inventories affect second language pronunciation. Specifically, the study asks: (1) What are the major typological differences between the English and Kanuri vowel systems in terms of quantity, quality, and phonemic contrasts? (2) How do native speakers of Kanuri realise English vowel phonemes that are not present in their L1? (3) Which English vowels are most vulnerable to substitution, distortion, or neutralisation in the speech of Kanuri learners of English? And (4) to what extent does the lack of vowel length contrast in Kanuri influence the realisation of English long and short vowels? These research questions are intended to guide the investigation into how L1 vowel structures impact L2 English acquisition and to provide insight into phonological interference patterns specific to Kanuri speakers.

LITERATURE REVIEW

EFL Teachers' Beliefs and Practices of Written Corrective Feedback

Lado (1957) emphasises that while comparing phonemic charts is a necessary first step in identifying phonological issues between two languages, it is not sufficient on its own. He argues that pronunciation difficulties may arise not only from the absence of equivalent phonemes but also from differences in phonemic variants, distribution, and phonotactic patterns. Therefore, a thorough phonological comparison must consider the full inventory of phonemes, their features, variants, and distribution across both languages. Lado also notes the importance of comparing specific dialects, especially standard ones, due to their influence on language learning. Going by this argument, this study compares and contrasts the standard variety of English called non-regional variety (NRP) and the Yerwa dialect of Kanuri, the most widely spoken and standard dialect of Kanuri. The study is best situated within the following two theoretical frameworks:

1. Flege's (1995) Speech Learning Model (SLM), posits that L2 sounds are perceived in terms of their similarity to L1 categories. Where a close match exists, learners may assimilate the L2 sound into an existing L1 category, leading to phonemic substitution.
2. Similarly, Best's (1995) Perceptual Assimilation Model (PAM) provides insight into the perception-driven nature of these substitutions. PAM suggests that L2 sounds are assimilated based on the perceptual closeness to L1 categories, and that multiple L2 sounds may map onto a single L1 phoneme or vice versa, leading to substitution, merger, or confusion. Together, the two models provide a robust basis for analysing the observed L1 interference and inform pedagogical approaches to address these challenges.

Recent research continues to validate the strong influence of learners' L1 phonological systems on the acquisition of L2 vowels, confirming and extending the above earlier frameworks such as the Speech Learning Model (Flege, 1995) and the Perceptual Assimilation Model (Best, 1995). Islam et al. (2024), for example, demonstrated that Bangla speakers faced challenges acquiring English tense-lax high vowel contrasts, even though their L1 included mid-vowel contrasts, suggesting that mere structural similarity between L1 and L2 does not guarantee accurate L2 vowel perception. This aligns with findings by Schlechtweg et al. (2023), who observed significant variability among L1 German learners in distinguishing English vowel contrasts, depending on their regional L1 dialect and exposure to English varieties. Kartushina et al. (2014) further highlighted that L2 vowel production accuracy is closely tied to perceptual ability, showing that learners with better discrimination skills produce vowels more accurately.

Similarly, Georgiou (2024) and Constantinou et al. (2024) found that multilingual and bilingual listeners outperformed monolinguals in English accent categorisation tasks, especially when the L2 accent was familiar, indicating that prior exposure and L1 familiarity shape both perception and categorisation. Targeted perceptual training significantly improved learners' ability to distinguish English vowel contrasts, underscoring the role of perceptual plasticity in overcoming L1-based difficulties. Additionally, Archibald (2021) reviewed the relative ease or difficulty of acquiring L2 phonological features and noted that markedness, perceptual salience, and frequency of exposure all play key roles in acquisition success. Collectively, these studies support the rationale of the present research: to explore how Kanuri speakers' L1 vowel inventory affects the perception and production of English vowels, particularly where segmental contrasts (e.g., long vs. short, central vs. front vowels) are absent or weakly represented in Kanuri. They also justify the study's inclusion of spontaneous and read speech data, where orthographic interference and planning may further reveal patterns of phonological transfer.

Empirical Studies on L2 Vowel Acquisition

A growing body of empirical research supports these theoretical models by documenting the specific ways in which L1 phonology constrains L2 vowel perception and production. For example, Munro and Derwing (2008) conducted a longitudinal study on adult ESL learners and found that certain English vowels, especially those lacking equivalents in learners' L1s, remained difficult to produce accurately, even after years of exposure. Their findings emphasised the persistent influence of L1 categories in shaping L2 phonetic outcomes. Zhang (2019) explored similar issues in Mandarin-speaking learners of English, showing that contrasts such as /iː/ vs. /ɪ/ and /uː/ vs. /ʊ/ were frequently collapsed or approximated due to the lack of tense–lax distinctions in Mandarin. Learners substituted unfamiliar L2 vowels with the closest available L1 equivalents, consistent with PAM-L2 predictions. In African contexts, Babalola and Taiwo (2016) investigated Yoruba-speaking learners of English and observed systematic monophthongisation of diphthongs, length neutralisation, and reliance on orthographic forms in pronunciation. These patterns closely mirror the findings of the current study on Kanuri speakers and suggest that phonological transfer is a widespread phenomenon among African EFL learners, though the specific realisation patterns depend on the structure of the L1.

More recent work by Georgiou (2024) and Constantinou et al. (2024) has expanded the scope of research to include the effects of multilingual exposure and accent familiarity. Their findings indicate that bilingual and multilingual listeners are generally better at distinguishing L2-accented varieties, especially when the accent is familiar, suggesting that linguistic background and perceptual tuning can facilitate both perception and, potentially, production of non-native vowels. Saito and Lyster (2012) further emphasised the value of form-focused instruction and corrective feedback, particularly in improving L2 segmental accuracy. Although their work focused on

consonants, their findings reinforce the importance of targeted instruction for features that are perceptually or articulatorily difficult, such as English vowel length and centralisation for learners from languages without such distinctions.

RESEARCH METHOD

This study adopts a mixed-method approach, combining qualitative contrastive analysis (Stage One) with empirical phonetic data collection (Stage Two).

Stage One: Secondary Data

This stage draws on published phonological descriptions of the languages under investigation. Asrecommended by Lado (1957), James (1980) also argues that in contrastive analysis of sound systems of languages, four steps are used: (1) Drawing up the phonemic inventory of both languages (2) Equating phonemes of both languages (3) Making a list of allophones of both phonemes (4) Stating the distributional restrictions on the phoneme and allophones of both languages. Following their approach, the study involved outlining the phonemic inventories of English and Kanuri, identifying equivalent phonemes across both languages, and detailing their respective allophones and distributional patterns. A comparative analysis was conducted using established phonological data drawn from the following sources. Vowel phoneme charts and distributions for both languages were extracted and compared to predict areas of phonemic overlap and potential interference.

More recent work, such as Georgiou (2024) and Constantinou et al. (2024) confirms that learners' L1 phonological systems significantly affect both perception and production in L2 vowel acquisition, especially under conditions of accent familiarity or unfamiliarity.

1. Cambridge English Pronouncing Dictionary (17th ed., Jones, 2006)
2. Roach (2009), English Phonetics and Phonology
3. Cruttenden (2014), Gimson's Pronunciation of English
4. Collins & Mees (2013), Practical Phonetics and Phonology
5. Bulakarima & Shettima (2012), A Sketch of Kanuri Phonology and Tone

Stage Two: Primary Data

Stage Two involved the collection and analysis of primary speech data from native Kanuri speakers to investigate the influence of Kanuri vowel patterns on the production of English vowels. Fifteen native Kanuri speakers from Bama, Borno State, Nigeria, participated in the second phase. Participants engaged in two speech tasks: spontaneous speech on self-chosen topics and the reading of an excerpt from a Nigerian newspaper. Recordings of three participants were fully transcribed and analysed phonetically; the remaining twelve were used to validate general patterns. The study involved the collection of primary data, and the analysis is qualitative in nature, focusing on auditory phonetic transcription and linguistic pattern identification, rather than statistical generalisation. The methodological approach is therefore qualitative, within a descriptive-exploratory framework.

Participant Selection

Fifteen native speakers of Kanuri were recruited from Bama town and surrounding communities in Borno State, Nigeria. All participants were adults aged between 18 and 30, with several years of formal instruction in English.

Sampling technique

A purposive sampling strategy was employed to ensure that participants had similar educational backgrounds and could read aloud in English, but varied slightly in their exposure to spoken English outside of academic settings. This sampling method ensured access to participants whose speech reflects typical Kanuri-accented English, aligning with the study's goal of describing systemic L1 interference.

Data Collection Procedure

Two types of speech tasks were used:

1. Reading Task: Participants were asked to read a short passage and a word list containing target English vowels embedded in minimal pairs (e.g., *bit–beat*, *cot–cut*, *ship–sheep*). The list was designed to include all monophthongal vowels of English, with a focus on tense-lax contrasts and vowel length distinctions.
2. Spontaneous Speech Task: Following the reading task, participants engaged in a brief, semi-structured interview or conversation on familiar topics (e.g., family, university life, hometown), lasting approximately 3–5 minutes. This allowed for the observation of naturalistic vowel usage outside the influence of written prompts.

Recording Setup

All recordings were made in a quiet room using a Zoom H4n digital audio recorder with an external lapel microphone, capturing high-quality 44.1kHz, 16-bit audio. Sessions were conducted individually and lasted approximately 5–10 minutes per participant. Each session was audio-recorded and transcribed manually.

Transcription and Data Preparation

Recordings were transcribed orthographically and then phonetically using narrow IPA transcription by the primary researcher. To ensure transcription reliability, 20% of the data was independently transcribed by a second trained phonetician. Inter-rater agreement was calculated, and discrepancies were resolved through discussion. Particular attention was paid to vowel qualities and durations, especially in contexts of known L1 interference (e.g., the substitution of long vowels with short equivalents).

Data Analytical Approach

The analysis was primarily qualitative and auditory, focusing on the segmental features of English vowels as produced by the Kanuri speakers. Vowel productions were compared with standard British English targets and were evaluated for:

1. Substitution patterns (e.g., [ɪ] → [i], [æ] → [a])
2. Duration effects (e.g., lack of length distinction between /iː/ and /ɪ/)
3. Centralisation or vowel neutralisation

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FINDINGS AND DISCUSSION

English Vowel Phonemes

The phonemic inventories of English and Kanuri are first presented individually. All vowel phonemes from both languages are listed in a comparative table. This is followed by two additional tables that highlight the shared and distinct vowel phonemes of the two languages. Furthermore, a separate table illustrates the possible phoneme distributions within sample words from both English and Kanuri.

The English Monophthongs

The chart below contains the twelve English monophthongs (short and long vowels). The symbols with double dots represent the long vowels, while those without represent the short ones.

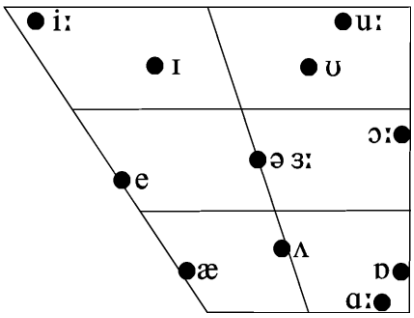
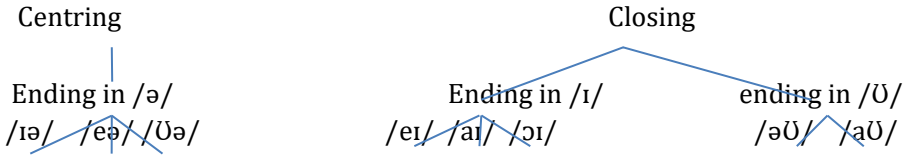


Figure 1. RP vowel chart (monophthongs)
Source: Wikimedia Commons (n.d.)

English diphthongs



The Kanuri Vowel Phonemes

As presented in Table 1, Kanuri has six vowel phonemes. The sound in the bracket is not an independent vowel phoneme but a variant of the/a/ phoneme, as shown beside.

Table 1. The Kanuri vowels (adapted from Bulakarima & Shettima, 2012)

	Front	Central	Back
High	ɪ		Ʊ
Mid	e	Ə	O
Low		a [ʌ]	

English and Kanuri Vowel Comparison

Table 2 compares all vowel phonemes existing in both English and the Kanuri languages.

Table 2. Comparison of English and Kanuri Vowel Phonemes

	ENGLISH	KANURI
Short	æ ʊ ə ɪ ʌ ɒ e	ʊ ə ɪ ɒ e a (ʌ)
Long	ɪː ɑː ɜː ʊː ɒː	
Diphthong	ɪə eə ʊə eɪ aɪ ɒɪ aʊ əʊ	

The left section of Table 3 presents similar vowels existing in both languages, while the right section depicts vowel disparity between the languages. It is predicted that Kanuri native speakers of English will not find it difficult to pronounce English words. The STRUT vowel /ʌ/ is an independent phoneme in English but an allophone of the vowel /a/ and is only distributed word medially in Kanuri.

Table 3. English and Kanuri Vowel Similarity and Contrast

Vowel Similarity		**Vowel Contrast**		
English	Kanuri		English	Kanuri
/ɪ/	/ɪ/	Short	/æ / /Ʊ/	/u/
/e/	/e/	Long	/ɪː ɑː ɜː ʊː ɒː/	--------
/ə/	/ə/	Diphthong	/ɪə eə ʊə eɪ aɪ ɒɪ aʊ əʊ/	--------
/ɒ/	/o/			
/ʌ/	[ʌ]			

Research hypotheses

Based on the above comparative phonological analysis of English and Kanuri, the study proposes several hypotheses regarding vowel production. First, it is hypothesised that Kanuri speakers will have difficulty distinguishing and accurately producing English vowel length contrasts due to the absence of this feature in their L1. Second, English vowels that do not exist in Kanuri, particularly central vowels such as /ʌ/ and /ɜː/—are expected to be replaced by the closest Kanuri equivalents or reduced to a neutral schwa-like sound. Third, diphthongs in English are likely to be simplified into monophthongs by Kanuri speakers, as Kanuri lacks diphthongal contrasts. Finally, it is hypothesised that the high vowel density and overlapping qualities in English will lead to higher variability and less intelligible vowel production in the speech of Kanuri learners. Further three specific hypotheses and a discussion of the predicted Kanuri realisations of the English vowel phonemes are given below.

H1: Kanuri speakers will substitute English long vowels with the nearest Kanuri short vowels.
H2: English central vowels absent in Kanuri will be realised as [a]. [e] or [ə].
H3: English diphthongs will be reduced or altered through epenthesis.
H4: Spelling will influence pronunciation more strongly in reading than in spontaneous speech.

The English Short Vowels

The English TRAP vowel /æ/ may be realised as [ʌ] or [a] in Kanuri-English due to its unavailability in L1 Kanuri sound system; for example, 'cap' /kæp/ and 'cut' /kæt/ may be realised as [kʌp] and [kʌt] or [kap] and [kat], respectively. The first word ''cap'' if realised as predicted, will resemble the native realisation of other English words 'cup' and 'cut'.

The English Long Vowels

1. The FLEECE vowel /ɪː/ may be shortened [ɪ] due to its non-existence in Kanuri. Both long and short forms exist in English as contrastive vowel phonemes, as in 'seat' and 'sit'. Neutralising the vowels could result in confusing the sense of the words.
2. The NURSE vowel /ɜː/ may be realised as one of these three vowels: [ə], [a] or [e], resembling the Kanuri vowels /ə/ or /a/. It may not be surprising if [e] vowel phoneme replaces /3:/ since its similar form exists in Kanuri. For example:
3. The GOOSE vowel may be shortened as a similar form exists in Kanuri, resembling the L1 Kanuri one, for example, lose /luːz/ and choose /ʧuːz/ may be realised as [lus] and [ʧuz]
4. The THOUGHT vowel /ɔː/ may be shortened [ɒ] since its similar form does not exist in Kanuri, for example, sport /spɔːt/ and court /kɔːt/ may be realised as [spɔt] and [kɔt]. Some Kanuri words have similar long vowel /ɔː/. However, it is said to be a result of consonant deletion in between two identical vowel phonemes (Bulakarima and Shettima, 2012). For example, Mogoram/ mogoram/ is changed to moorram /mɔːram/. It is hypothesised that

this phonological process may help Kanuri speakers of English to pronounce the long vowel correctly.

5. The START vowel /ɑ:/ may be shortened to [a] in Kanuri-English since a similar form does not exist in L1 Kanuri, thereby resembling the one in Kanuri, for example, 'car' /kɑ:/ may be realised as [ka] and 'card' /kɑ:d/ as [kad].

The English Diphthongs

1. The NEAR /vowel ɪə/ may be realised as [ɪja] due to the lack of an equivalent one in Kanuri, predicting [j] consonant epenthesis in between the two parts of the diphthong, for example, hear /hɪə/ may be realised as [hɪja] and ear /ɪə/ as [ɪja]
2. The SQUARE vowel /eə/ may be realised as [eja], having an epenthetic [j] consonant in between the two parts of the diphthong, for example, air /eə/ may be realised as [eja] and share /ʃeə/ as [ʃeja].
3. The CURE diphthong /uə/ may be realised as [uwa], having epenthetic bilabial approximant [w] in Kanuri-English, due to the absence of an equivalent vowel in L1 Kanuri sound system. It is worth stating that some Kanuri words have /uwa/ structure in two or three syllabic words. For example: muwa /muwa/ (deaf); duwa /duwa/ (to slaughter); kamuwa /kamuwa/ (women). Thus, English words tour /tuə/ and poor /puə/ may be realised as [tuwa] and [puwa].
4. The FACE diphthong /eɪ/ may be reduced to be realised as its first part [e], resembling an equivalent phoneme in the Kanuri sound system, for examples, gate /geɪt/ may be realised as [get] and tail /teɪl/ as [tel]. This predicted realisation of both words could result in confusing them with other English words get /get/ and tell /tel/, causing negative semantic implication.
5. The PRICE diphthong /aɪ/ may be realised as [aɪ] in Kanuri-English due to the availability of a similar structure in L1 Kanuri, though not as an independent vowel phoneme, generated from an elision of a consonant within a Kauri word. Bulakarima and Shettima (2012) argue that diphthongisation is not a phonemic issue but a consequence of consonant elision through a weakening process, for example, maira /maɪra/ (a Kanuri traditional title offered to the mother of a Kanuri monarch). Thus, it is hypothesised that Kanuri English speakers may easily realise the diphthong PRICE as native speakers do, for example, buy may be realised as [baɪ] and my as [maɪ].
6. The CHOICE diphthong /ɔɪ/ may be realised as [ɔɪ] in Kanuri-English, though there is no structure similar to this one in Kanuri, for example, boy /bɔɪ/ may be realised as [bɔɪ] and employment /ɪm'plɔɪment/ and [ɪmplɔɪment].
7. The GOAT diphthong /əʊ/ may be realised as [ɔ] due to the lack of a similar form in Kanuri, for example, the English word goal /gəʊl/ may be realised as [gɔl] and coat /kəʊt/ as [kɔt]. The meaning of 'coat' of the second example is confused with another English word, 'cot' an outer garment, or a baby's small bed.
8. The MOUTH diphthong /aʊ/ may be realised as [aʊ], resembling a similar structure in the Kanuri sound system, a syllable reduction. Some structures resemble the diphthong /aʊ/, for example, kawu 'cold weather' is realised as [kau] in Kanuri. Thus, it is predicted that the MOUTH diphthong may easily be realised in Kanuri-English, for example, doubt /daʊt/ may be realised as [daut]; cow /kaʊ/ as [kau], and loud /laʊd/ and [laʊd].

In conclusion, Table 4 provides a list of the hypothesised realisations in relation to the contrastive study of the two languages' phonological accounts. As shown, the first vowel /æ/ will have two predicted mispronunciations and the third long vowel /ɜ:/ will have three predicted

mispronunciations, while each of the other four vowels is identified with a single mispronunciation. It also provides five diphthongs that are hypothesised to have varied realisations in Kanuri-English. As shown above, FACE /e/ may be realised as DRESS [e], dropping the second part of the diphthong. The GOAT diphthong /əʊ/ may be realised as another English diphthong /aʊ/. On the other hand, the three centring vowels, NEAR, SQUARE, and CURE, may have an epenthetic palatal approximant [j] in between them, while MOUTH may also have an epenthetic bilabial approximant [w], as a result of gliding from the first parts.

Table 4. Predicted realisations of English vowels in Kanuri-English

Monophthongs			**Diphthongs**		
/æ/		[a, ʌ]	/eɪ/		[e]
/ɪ:/		[ɪ]	/əʊ/		[au]
/ɜ:/	→	[a, e, ə]	/ɪə/	→	[ɪja]
/a:/		[a]	/eə/		[ejə]
/ɒ:/		[ɔ]	/ʊə/		[uwa]
/ʊ:/		[u]			

Results: Stage Two

This section presents the realisation patterns of selected English vowel phonemes by native Kanuri speakers. The analysis focuses on phonemes that lack direct equivalents in the Kanuri vowel inventory. Several English vowels are subject to multiple phonetic realisations, often influenced by the articulatory constraints or lack of equivalents in the speakers' L1. Figures 2 and 3 show the Kanuri realisations of the target English short monophthongs, indicating the rate of the realisation across the three speakers for each vowel phoneme.

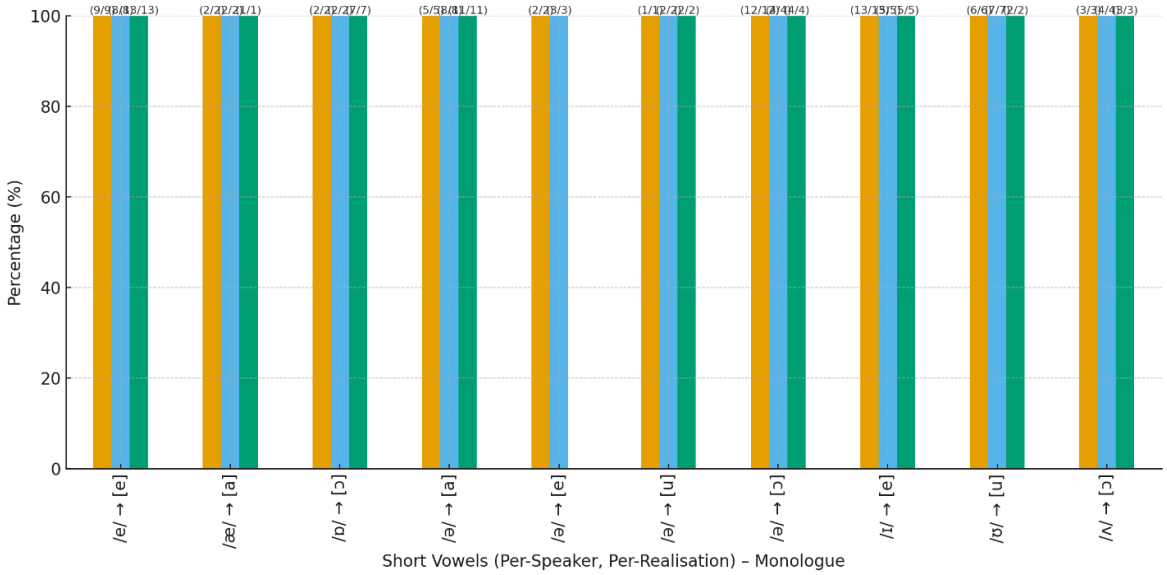


Figure 2. English Short Vowel Realisations by the Kanuri Native Speakers: Monologue

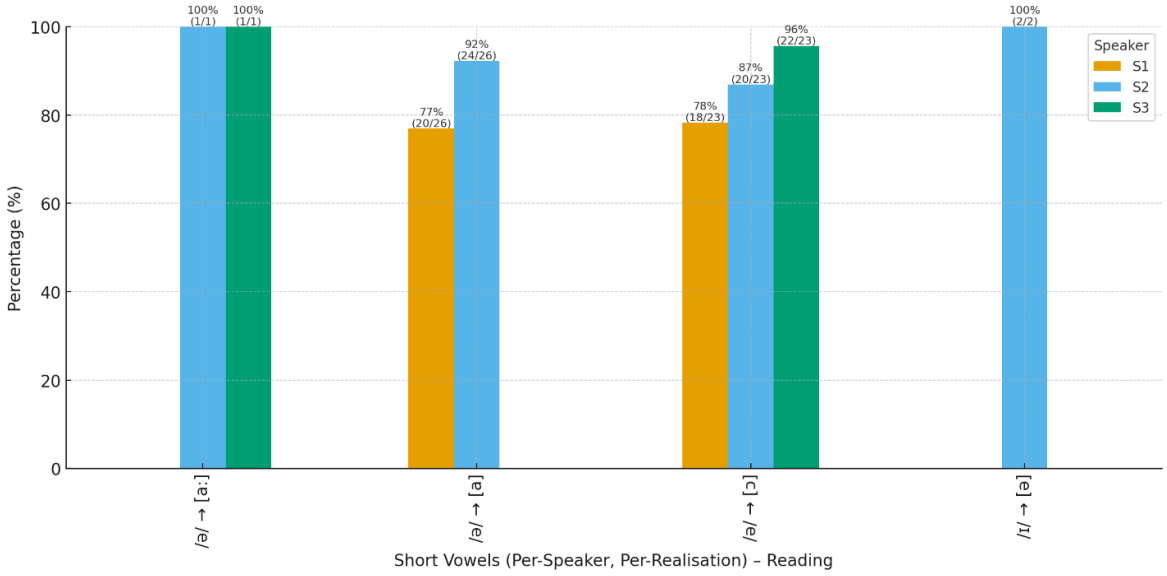


Figure 3. English Short Vowel Realisations by the Kanuri Native Speakers: Monologue

Monophthongs: short

The English KIT vowel is realised in several ways in Kanuri English. It is realised as DRESS [e] mainly when spelled with <e> or <y> monograph in orthography, as shown and evidenced in Table 5.

Table 5. Realisation of the English KIT Vowel (/ɪ/) in Kanuri English (Monophthongs: short)

Phoneme	**Realisation**	**Exemplar words**	**Number of attempts & Percentage of realisation**	
/ɪ/	**[e]**		**In monologue**	**In reading excerpt**
Speaker1		'college' [kɔledʒ]		(13/13) 100%
Speaker2		'college' [kɔledʒ]		(5/5) 100%
Speaker3		'college' [kɔledʒ]		(5/5) 100%
	[ə]			
Speaker1				
Speaker2		'citizen' [sɪtɪzən]	(2/2) 100%	
Speaker3				

The SCHWA is also realised in five ways in Kanuri-English, ranging from [ɔ], [a], [e], [a:], and [u], as shown in Table 6. It is mainly realised as [ɔ], mostly when represented by the letter <o> or <io> digraph in spelling or orthography, as evidenced in the table. It is totally represented as such by all speakers in their attempts in the monologues. It is in another way realised as [a] when preceded by /l/ consonant, as shown in the table. It may be realised as [e] when spelled as <e> in English words. It is again variably realised as [u] when autographically represented by <o> or <u>, as evidenced in the table. It is occasionally realised as [a:] at a word boundary, as in the word dollars.

Table 6. Speakers' Realisation of the Schwa /ə/

Phoneme	**Realisation**	**Exemplar words**	**Number of attempts & Percentage of realisation**	
/ə/	[ɔ]		**In monologue**	**In the reading excerpt**
Speaker1		'local' [lɔkal]	(12/12) 100%	
		'motor' [mɔta]		(18/23) 78%
Speaker2		'protocol' [prɔtəkɔl]	(4/4) 100%	
		'complete'[kɔmplɪt]		(20/23) 86.9%
Speaker3		'nation' [neɪʃɔn]	(4/4) 100%	
		'admission[admɪʃɔn]		(22/23) 95.6%
	[a]			
Speaker1		'after' [afta]	(5/5) 100%	
		'assist' [asɪst]		(20/26) 76.9%
Speaker2		'local' [lakal]	(8/8) 100%	
		'critical'[krɪtɪkal]		(24/26) 92%
Speaker3		'critical' [krɪtɪkal]	(11/11) 100%	
	[e]			
Speaker1		'government' [gapment]	(2/2) 100%	
Speaker2		'development' [debelɔpment]		(3/3) 100%
Speaker3				
	[a:]			
Speaker1		----------		
Speaker2		'dollars' [dɔlɑ:s]		(1/1) 100%
Speaker3		'dollars' [dɔlɑ:s]		(1/1) 100 %

Phoneme	Realisation	Exemplar words	Number of attempts & Percentage of realisation
	[u]		
Speaker1		'forum' [fɔrʊm]	(1/1) 100%
Speaker2		'people' [pɪpul]	(2/2) 100%
Speaker3		'sustain] [sustain]	(2/2) 100%

The English STRUT is invariably realised as [ɔ] in Kanuri English, as shown in Table 7. This is observed in the speech of all the Kanuri English data providers. On the other hand, TRAP is mainly realised as [a].

Table 7. Speakers' Realisation of STRUT /ʌ/ and TRAP /æ/

Phoneme	Realisation	Exemplar words	Number of attempts & Percentage of realisation	
STRUT /ʌ/	**[ɔ]**		**In monologue**	**In the reading excerpt**
Speaker1		'but' [bɔt]		(3/3) 100%
Speaker2		'but' [bɔt]		(4/4) 100%
Speaker3		'but' [bɔt]		(3/3) 100%
TRAP/æ/	[a]			
Speaker1		'captain' [kaptin]	(2/2) 100%	
Speaker2		'back' [bak]	(2/2) 100%	
Speaker3			(1/1) 100%	

The English DRESS is invariably realised as [e], FOOT as [u], while LOT is realised as [ɔ], as evidenced in Table 8.

Table 8. Speakers' Realisation of DRESS, FOOT, and LOT Vowels

Phoneme	Realisation	Exemplar words	Number of attempts & Percentage of realisation	
DRESS /e/	**[e]**		**In monologue**	**In the reading excerpt**
Speaker1		'head' [hed]	(9/9) 100%	
Speaker2		'help' [help]	(8/8) 100%	
Speaker3		'get' [get]	(13/13) 100%	
FOOT /ʊ/	[u]			
Speaker1		'school' [skul]	(6/6) 100%	
Speaker2		'school' [skul]	(7/7) 100%	
Speaker3		'could' [kul]	(2/2) 100%	
LOT /ɒ/	[ɔ]			
Speaker1		'job' [dʒɔp]		(2/2) 100%
Speaker2		'lost' [lɔst]	(2/2) 100%	
Speaker3		'not' [nɔt]		(7/7) 100%

Long Vowels

The English FLEECE is shortened in Kanuri-English, resembling that of L1 Kanuri, as evidenced in the words in Table 9. GOOSE vowel is invariably shortened to [u] in Kanuri-English. All speakers realised the phoneme as such, indicating resemblance with the Kanuri vowel, as evidenced in the table. The THOUGHT vowel is also shortened to [ɔ] in the Kanuri-English accent, suggesting the influence of a similar phoneme in Kanuri, as shown in the table. Likewise, the START diphthong is realised as a shorter form [a] in Kanuri-English, particularly orthographically represented by digraph <ar> or monograph <a>, as shown in the table. Figures 4 and 5 show the Kanuri realisations of the target English short monophthongs, indicating the rate of the realisation across the three speakers for each vowel phoneme.

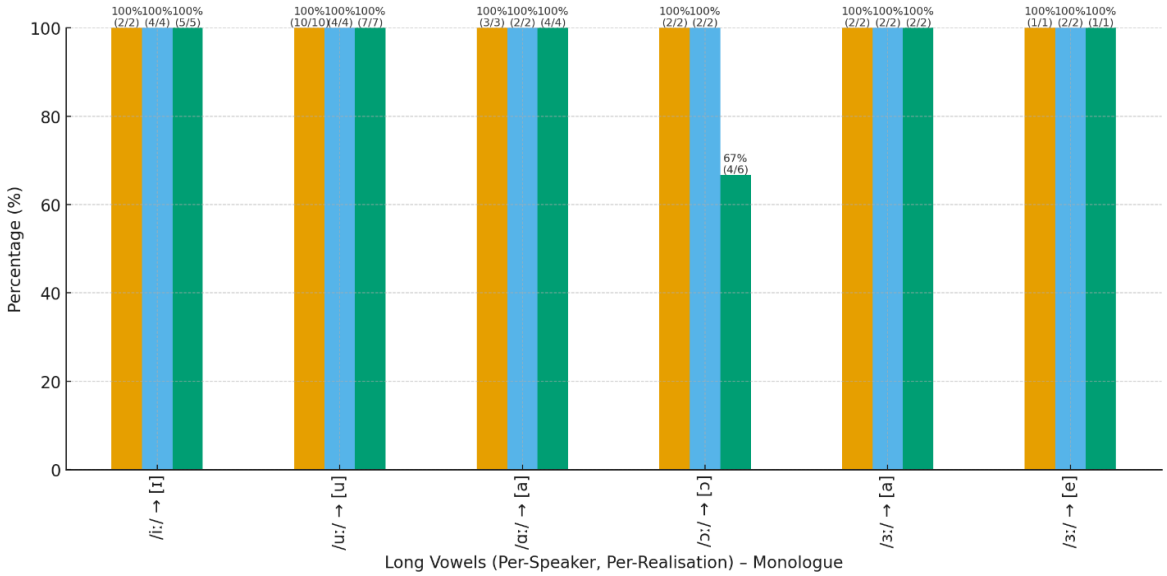


Figure 4. English Long Vowel Realisations by the Kanuri Native Speakers: Monogue

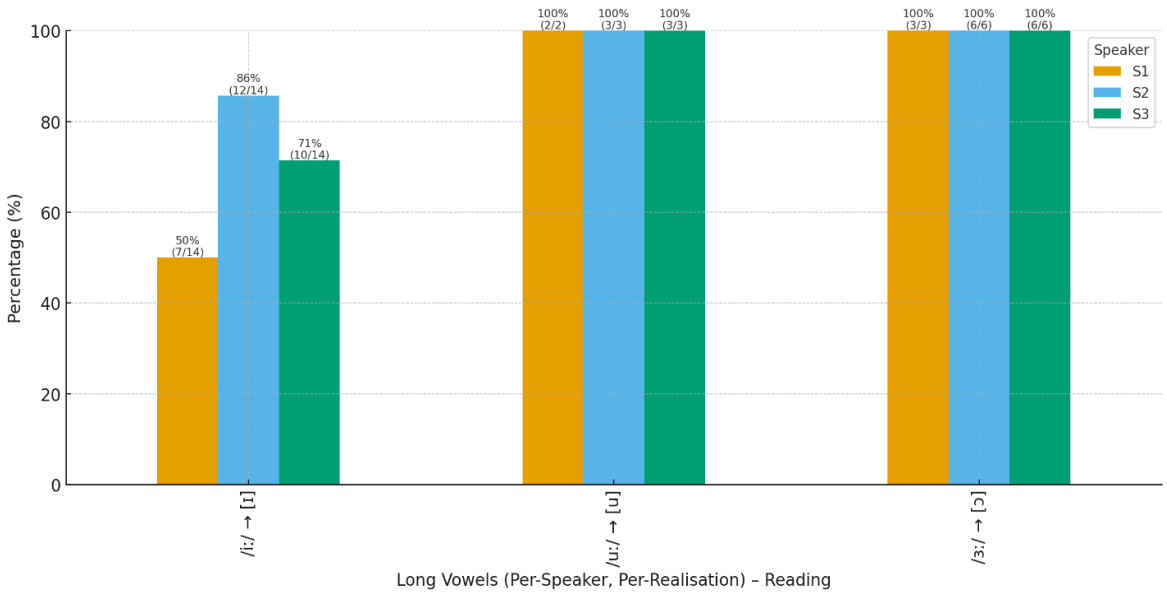


Figure 5. English Long Vowel Realisations by the Kanuri Native Speakers: Read Passage

Table 9. Speakers' Realisation of Long Vowels

Phoneme	**Realisation**	**Exemplar words**	**Number of attempts & Percentage of realisation**	
/ɪ:/	**[ɪ]**		**In monologue**	**In the reading excerpt**
Speaker1		'feeding'[fɪdɪn]	(2/2) 100%	(7/14) 50%
Speaker2		'leave' [lɪf]	(4/4) 100%	(12/14) 85.7%
Speaker3		'leave' [lɪf]	(5/5) 100%	(10/14) 71.4%
/ʊ:/	[u]			
Speaker1		'school' [sukul]	(10/10) 100%	(2/2) 100%
Speaker2		'school' [sukul]	(4/4) 100%	(3/3) 100%
Speaker3		'school' [sukul]	(7/7) 100%	(3/3) 100%
/ɒ:/	[ɔ]			
Speaker1		'door' [dɔ]	(2/2) 100%	
Speaker2		'door' [dɔ]	(2/2) 100%	
Speaker3		'door' [dɔ]	(4/6) 66.6%	
/ɑ:/	[a]			
Speaker1		'started' [statet]	(3/3) 100%	
Speaker2		'started' [statet]	(2/2) 100%	
Speaker3		'started' [statet]	(4/4) 100%	

The English NURSE vowel is realised in several forms in Kanuri-English, mainly determined by variations in the spelling of words within which it occurs. As evidenced in Table 10, it is realised as [e] when spelled with digraph <ir> or <er>, while it is realised as [ɔ] when represented by digraph <ur> or <or>, as shown in the table. Another realisation of NURSE is [a] when also spelled with [ur] as evidenced in the word 'insurgency', as shown in the table.

Table 10. Speakers' Realisation of the NURSE Vowel /ɜ:/

Phoneme	**Realisation**	**Exemplar words**	**Number of attempts & Percentage of realisation**	
/ɜ:/	**[e]**		**In monologue**	**In the reading excerpt**
Speaker1		'first' [fest]	(1/1) 100%	
Speaker2			(2/2) 100%	
Speaker3			(1/1) 100%	
	[ɔ]			
Speaker1		'working' [wɔkɪn]		(3/3) 100%
Speaker2				(6/6) 100%
Speaker3				(6/6) 100%
	[a]			
Speaker1		'insurgency'[ɪnsadʒensɪ]		(2/2) 100%
Speaker2		'insurgency'[ɪnsadʒensɪ]		(2/2) 100%
Speaker3		'insurgency'[ɪnsadʒensɪ]		(2/2) 100%

Diphthongs and their Kanuri-English realisations

The English FACE vowel is mainly realised as [e] by all Kanuri English speakers, indicating a 100% rate in the monologue speech data, and a range of 80-95% in the reading excerpt data, as shown in Table 11. However, the second Kanuri speaker who took part in the research realised the FACE vowel as [e:] while reading the passage. This form neither resembles the native English realisation of FACE nor resembles the Kanuri phonetic/phonological system. For the realisation of the English PRICE vowel, an epenthetic palatal approximant [j] is observed intervocalically as [ajɪ], breaking the two parts of the diphthong apart, as evidenced in the table. For both NEAR and SQUARE vowels, epenthetic palatal approximant [j] is occasionally observed, with the SQUARE vowel being more affected, with a 75% rate of [j] epenthesis, as evidenced in the table. Figures 6 and 7 show the Kanuri realisations of the target English short monophthongs, indicating the rate of the realisation across the three speakers for each vowel phoneme.

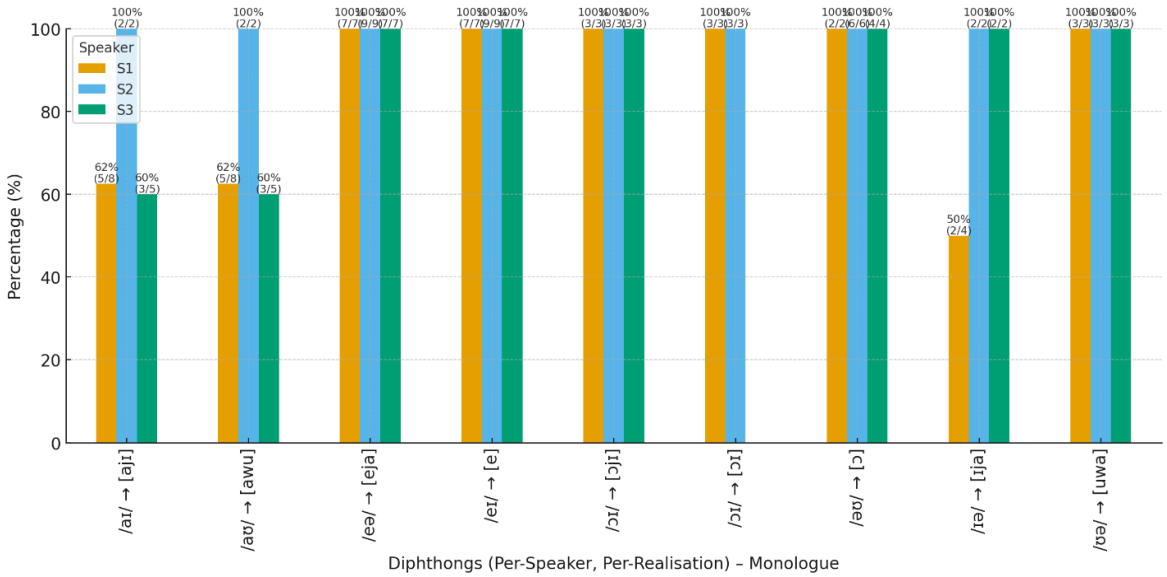


Figure 6. English Diphthongs Realisations by the Kanuri Native Speakers: Monologue

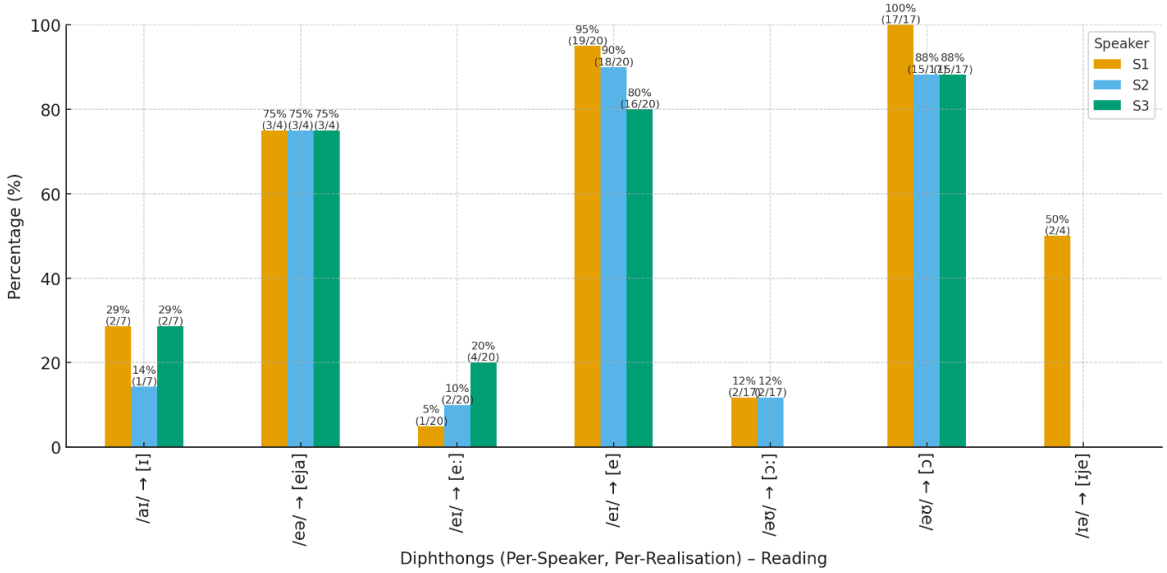


Figure 7. English Diphthongs Realisations by the Kanuri Native Speakers: Read Passage

Table 11. Speakers' Realisation of English Diphthongs

Phoneme	**Realisation**	**Exemplar words**	**Number of attempts & Percentage of realisation**	
/eɪ/	**[e]**		**In monologue**	**In the reading excerpt**
Speaker1		'day' [de]	(7/7) 100%	(19/20) 95%
Speaker2		'eight' [e:t]	(9/9) 100%	(18/20) 90%
Speaker3		'name' [nem]	(7/7) 100%	(16/20) 80%
	[e:]			
Speaker1		'eight' [e:t]		(1/20) 5%
Speaker2		'eight' [e:t]		(2/20) 10%
Speaker3		'eight' [e:t]		(4/20) 20%
/aɪ/	[ajɪ]			
Speaker1		'science' [sajɪns]		(5/8) 62.5%
Speaker2		'science' [sajɪns]		(2/2) 100%
Speaker3		'science' [sajɪns]		(3/5) 60%
	[ɪ]			
Speaker1		'bilingual'[bɪlɪngal]		(2/7) 28.5%
Speaker2		'bilingual'[bɪlɪngal]		(1/7) 14.2%
Speaker3		'bilingual'[bɪlɪngal]		(2/7) 28.5%
/ɒɪ/	[ɔɪ]			
Speaker1		'joined' [jɔɪn]	(3/3) 100%	
Speaker2		'joined' [jɔɪn]	(3/3) 100%	
Speaker3				
	[ɔjɪ]			
Speaker1		'point' [pɔjɪn]		(3/3) 100%
Speaker2		'point' [pɔjɪn]		(3/3) 100%
Speaker3		'point' [pɔjɪn]		(3/3) 100%

NEAR diphthong is mainly realised as [ɪja] and occasionally as [ɪjɔ] or [[ɪje]. The [ɪjɔ] realisation is observed to be an effect of spelling interference, where words such as spelled or ending with digraph <io> influence such a realisation, as shown in Table 12.

Table 12. Speakers' Realisation of Complex Diphthongs

Phoneme	**Realisation**	**Exemplar words**	**Number of attempts & Percentage of realisation**	
/ɪə/	**[ɪja]**		**In monologue**	**In reading excerpt**
Speaker 1		'area' [erɪja]	(2/4) 50%	
Speaker 2		'billion' [bɪlɪjan]		(2/2) 100%
Speaker 3		'hear' [hɪja]	(2/2) 50%	
	[ɪjɔ]			
Speaker 1		'senior' [sɪnɪjɔ]	(3/3) 100%	
		'billion' [bɪlɪjɔn]		(2/4) 50%
	[ɪje]	'hear' [hɪje]	(3/4) 75%	

Speaker 2				
/eə/	[eja]			
Speaker 1		'there' [deja]	(7/7) 100%	(3/4) 75%
Speaker 2		'there' [deja]	(9/9) 100%	(3/4) 75%
Speaker 3		'there' [deja]	(7/7) 100%	(3/4) 75%
CURE/ʊə/	[uwa]			
Speaker 1		'poor' [puwa]		(3/3) 100%
Speaker 2		'poor' [puwa]		(3/3) 100%
Speaker 3		'poor' [puwa]		(3/3) 100%

The MOUTH vowel is also realised [awu] with an epenthetic bilabial approximant [w], occurring in between its two parts, as shown in Table 13. This realisation suggests an influence of spelling the English words such as <town>. This resembles a common practice even among some native speakers of modern English, indicating no serious deviation from the native pronunciation. The GOAT vowel is mainly realised as [ɔ] by all Kanuri speakers of English, as evidenced in the table, suggesting spelling influence where monograph <o> stands for the sound in the English orthography.

Table 13. Speakers' Realisation of MOUTH and GOAT Vowels

Phoneme	**Realisation**	**Exemplar words**	**Number of attempts & Percentage of realisation**	
/aʊ/	**[awu]**		**In monologue**	**In the reading excerpt**
Speaker1		'town' [tawun]		(5/8) 62.5%
Speaker2		'town' [tawun]		(2/2) 100%
Speaker3		'town' [tawun]		(3/5) 60%
/əʊ/	[ɔ]			
Speaker1		'home' [hɔm]	(2/2) 100%	(17/17) 100%
Speaker2		'go' [gɔ]	(6/6) 100%	(15/17) 88.2%
Speaker3			(4/4) 100%	(15/17) 88.2%
	[ɔ:]			
Speaker1		'loan' [lɔ:n]		(2/17) 11.7%
Speaker2		'loan' [lɔ:n]		(2/17) 11.7%
Speaker3				

Summary of the findings

The analysis of vowel realisations by Kanuri native speakers reveals significant patterns of L1 interference, phonological approximation, and orthographic influence in the acquisition of English vowels. A key finding is the tendency for Kanuri speakers to substitute unfamiliar English vowel phonemes with their closest L1 equivalents. For instance, the English KIT vowel /ɪ/ is frequently realised as [e], especially when associated with the spelling monographs <e> or <y>. This pattern is consistently observed across all speakers and exemplifies the orthographic influence on

phonological output.

The SCHWA /ə/, known for its high contextual variability in English, demonstrates a wide range of realisations in Kanuri-English, including [ɔ], [a], [e], [aː], and [u]. These variants appear to be driven by both phonological context (e.g., surrounding consonants) and orthographic representation, particularly the use of <o>, <a>, and <u> in English spelling. Such variation underscores the challenge posed by the SCHWA's abstract and context-dependent nature.

In terms of specific vowel categories, the English STRUT /ʌ/ vowel is uniformly realised as [ɔ], a substitution that indicates phonological approximation in the absence of a dedicated Kanuri equivalent. The TRAP vowel /æ/ is predominantly rendered as [a], while DRESS /e/, FOOT /ʊ/, and LOT /ɒ/ are each consistently matched with their closest Kanuri counterparts, revealing a relatively stble one-to-one mapping.

Long vowel realisations reveal a similar trend. The English FLEECE /iː/, GOOSE /uː/, and THOUGHT /ɔː/ vowels are regularly shortened in Kanuri-English. This shortening effect reflects the general lack of vowel length contrast in Kanuri, leading to segmental compression. The NURSE vowel /ɜː/ exhibits the highest degree of variation, realised as [e], [ɔ], or [a] depending on orthographic cues such as <er>, <ur> or <or>.

Regarding diphthongs, several epenthetic insertions are observed. The FACE /eɪ/ vowel is often reduced to [e], and the PRICE /aɪ/ diphthong is realised as [ajɪ], with a palatal glide [j] inserted intervocalically. NEAR /ɪə/ and SQUARE /eə/ vowels similarly exhibit epenthetic [j], and the CURE /ʊə/ vowel is realised as [uwa], indicating syllabic restructuring. The MOUTH diphthong /aʊ/ becomes [awu], and the GOAT vowel /əʊ/ is mostly realised as [ɔ], further confirming the influence of L1 phonology and English orthography.

Collectively, these results highlight the complexity of second language phonological acquisition among Kanuri learners. While some substitutions are predictable based on phonemic inventory mismatches, others, such as epenthetic sounds and orthographically motivated realisations, reveal deeper cross-linguistic interactions. This underscores the need for targeted phonological instruction that considers both segmental and suprasegmental features as well as learners' literacy background.

Discussion

This study investigated how native Kanuri speakers of English realise English vowel phonemes, with a focus on phonological interference driven by first language (L1) influence. The discussion is guided by the study's research questions and tested against the proposed hypotheses, which were grounded in a comparative phonological analysis of the English and Kanuri vowel systems. While Lado (1957) offers predictive power via structural contrast, Flege's SLM (1995) and Best's PAM (1995) explain the cognitive and perceptual limitations that cause learners to persist in L1-like production. Together, these models explain both the *why* and *how* of phonological interference

Vowel System Differences and the Challenge of Vowel Quantity

In response to the first research question concerning typological differences, the findings confirmed a significant contrast in both the size and structure of the vowel inventories. English has 20 vowel phonemes, including both length contrasts and diphthongs, while Kanuri has only six monophthongs and lacks contrastive vowel length. This supports the first hypothesis: *that Kanuri speakers would struggle to distinguish and produce English vowel length contrasts*. The data clearly show that long English vowels such as /iː/, /uː/, /ɑː/, and /ɜː/ are systematically shortened to their closest Kanuri counterparts—/ɪ/, /u/, and /a/—indicating a neutralisation of length distinctions in Kanuri-accented English.

Substitution and Reduction of Non-native Vowels

With regard to the second research question, the study examined how Kanuri speakers realise English vowels that are absent from their L1. As hypothesised in the second hypothesis, central vowels such as /ʌ/ and /ɜː/ are frequently substituted with Kanuri-available vowels or reduced to schwa-like or peripheral variants. For instance, /ʌ/ is predominantly realised as [ɔ], and /ɜː/ appears in multiple forms—[a], [e], [ə], and [ɔ]—highlighting the absence of a stable phonological anchor in the Kanuri system.

Diphthong Simplification and Glide Epenthesis

The third research question focused on which vowels are most vulnerable to distortion, substitution, or simplification. As predicted in the third hypothesis, English diphthongs tend to be simplified to monophthongs or restructured by inserting glides. For example, /eɪ/ is often realised as [e] or [eː], and /aɪ/ becomes [ajɪ], while /əʊ/ is replaced with [ɔ] or [ɔː]. Moreover, diphthongs like /ɪə/, /eə/, and /ʊə/ are realised as bisyllabic sequences such as [ɪja], [eja], and [uwa], often with palatal or labial glide insertion. These patterns reflect the lack of diphthongs in Kanuri and support the hypothesis that diphthongs are either neutralised or structurally adjusted in L2 production.

Vowel Density and Phonemic Overlap

Finally, addressing the fourth research question, the data confirm that the dense and overlapping vowel space of English leads to increased variability in Kanuri-accented English. This supports the fourth hypothesis: *that high vowel density and overlapping qualities in English would result in greater realisational variability and potentially less intelligible output*. English vowels like /ə/, /ɜː/, /ʌ/, and diphthongs such as /aʊ/, /əʊ/, and /ɪə/ show wide variation in Kanuri-English, suggesting perceptual and articulatory challenges due to both vowel complexity and spelling-pronunciation mismatches.

The variability observed in the NURSE vowel, along with the realisation of FACE as [eː] and the insertion of [j] in PRICE (e.g., [praɪs] → [prajis]), may be attributed to both sociolinguistic and educational factors within the Kanuri-speaking context. From a sociolinguistic perspective, the absence of standardised models of spoken English in many Kanuri-dominant regions means that learners are often exposed to regionalised varieties of Nigerian English or L1-influenced teacher input, which can introduce or reinforce non-standard forms (Gut, 2008; Uzoezie, 2020). The realisation of FACE as [eː] may reflect overgeneralisation from spelling (i.e., interpreting "face" orthographically as /feːs/), or analogical transfer from Hausa or Kanuri vowel systems, where similar graphemes map to mid front vowels. The epenthetic [j] in PRICE may result from learners' attempts to preserve syllable structure or avoid vowel-glide sequences unfamiliar in Kanuri phonotactics (Jibril, 1982; Flege, 1995). Such findings are also shaped by literacy-driven pronunciation strategies (Treiman & Kessler, 2006), where learners rely heavily on orthography in the absence of formal phonological instruction. Additionally, the variability in NURSE vowel realisation could reflect lexical diffusion or partial learning of context-specific variants (e.g., *girl*, *bird*, *nurse,* each behaving differently), influenced by exposure to mixed L2 models. These patterns highlight the need for pedagogical interventions that explicitly address phoneme-grapheme mismatches, promote exposure to standard spoken English varieties, and incorporate contrastive phonological training to reduce fossilised L1 transfer (Saito & Wu, 2014).

Theoretical implications

The findings of this study contribute to and extend existing models of second language phonological acquisition, particularly the Speech Learning Model (SLM) and the Perceptual

Assimilation Model for L2 learners (PAM-L2), by offering empirical data from a highly underrepresented language background: Kanuri, a Chadic language with a vowel system that differs considerably from English.

According to SLM (Flege, 1995), L2 learners form new phonetic categories only when they perceive sufficient acoustic–phonetic difference between the L2 sound and the closest L1 equivalent. In this study, the substitution of central vowels /ʌ/ and /ɜ:/ with Kanuri mid or back vowels supports this, reflecting the lack of perceptual contrast due to L1–L2 phonetic proximity. These results reinforce SLM's predictions but highlight its limitations in cases where the L1 has minimal vowel contrasts, like Kanuri.

PAM-L2 (Best & Tyler, 2007) posits that learners' perception of L2 sounds is shaped by how those sounds are assimilated into L1 categories. The substitution of diphthongs (e.g., /aɪ/) with monophthongs and the merging of vowel length contrasts reflect Single Category (SC) and Category Goodness (CG) assimilation, where two L2 categories are perceived as variants of one L1 vowel. These patterns extend PAM-L2 by illustrating its application in typologically distinct languages with no length or diphthongal contrasts. The findings also highlight orthographic interference, where English spelling influences pronunciation, suggesting the need to refine both models to include educational and literacy factors, particularly in low-resource, multilingual contexts. Thus, the study confirms core model predictions while contributing new insights from a Chadic language background, expanding the cross-linguistic validity of L2 phonological theory.

CONCLUSIONS

This study explored the phonological relationship between English and Kanuri vowel systems, with specific focus on how native Kanuri speakers of English realise English vowels that are absent or structurally different in their L1. By comparing the phonemic inventories of the two languages and analysing primary speech data, the study confirmed several patterns of phonological interference shaped by typological mismatches. The findings validate the hypotheses that the absence of contrastive vowel length in Kanuri results in the neutralisation of English long-short distinctions, and that central vowels and diphthongs, which do not exist in Kanuri, are either substituted with nearest equivalents or simplified. Moreover, the presence of epenthetic glides and frequent vowel substitutions reflects both perceptual difficulty and spelling-based influence, especially in reading tasks. More broadly, the study contributes to the field of second language acquisition by showing how vowel inventory asymmetries between L1 and L2 can systematically affect pronunciation. It also has pedagogical implications for pronunciation instruction among Kanuri-speaking learners of English, suggesting that targeted vowel training and orthographic awareness could mitigate interference and improve intelligibility. Future research could expand this study by incorporating suprasegmental features, exploring perception in addition to production, or examining the influence of orthographic depth in English on Kanuri learners' vowel articulation. It could also focus on pedagogical applications of these findings, including the design of pronunciation teaching materials.

Pedagogical Implications for English Teaching in Kanuri Contexts

The findings of this study have clear implications for English language teaching in Kanuri-speaking contexts, particularly with regard to the acquisition of English vowel contrasts. First, the observed substitutions and mergers, such as the realisation of /ɜ:/ and /ʌ/ with near-front or mid-vowels, highlight the need for explicit vowel training. Teachers should incorporate contrastive drills focusing on vowel quality and duration, especially for tense–lax and central vowel distinctions that are absent or neutralised in Kanuri. Second, the role of orthography in shaping pronunciation errors suggests the importance of raising learners' awareness of English's inconsistent spelling-sound

correspondences. Instruction should explicitly address cases where orthography does not reliably predict vowel quality, helping learners to move beyond reliance on written cues. Third, the frequent monophthongisation or misrealisation of diphthongs such as /aɪ/ and /eɪ/ underscores the need for focused diphthong instruction. This can be supported through the use of auditory models, minimal pair practice, and visual vowel charts that make diphthong movement perceptually salient. Finally, there is a pressing need for locally appropriate pronunciation materials tailored to the phonological profile of Kanuri L1 speakers. Such resources should reflect the most common areas of difficulty identified in this study and offer practical, context-sensitive activities to improve learners' perceptual and productive accuracy in English vowels. By addressing these pedagogical priorities, English teaching in Kanuri contexts can be better aligned with learners' phonological needs and contribute to improved oral proficiency outcomes.

LIMITATION & FURTHER RESEARCH

While this study offers valuable insights into the phonological transfer patterns among Kanuri L1 speakers learning English, several limitations should be acknowledged:

1. Sample size and demographics: The study involved a relatively small sample of 15 male participants, all of whom were upper-intermediate to advanced learners. The exclusion of female participants and lower proficiency levels limits the generalisability of the findings.
2. Dialectal and regional variation: All participants spoke the Yerwa dialect of Kanuri and were from a specific region (Bama, Borno State). This narrow dialectal representation may not reflect the full range of variation present across the broader Kanuri-speaking population.
3. Data elicitation method: While both scripted and spontaneous speech were collected, the primary analysis focused on auditory transcription. The absence of acoustic measurements may have reduced the precision of segmental analysis, particularly for features like vowel length, quality, or diphthongisation.
4. Orthographic influence: Although the study discusses orthographic interference, it does not systematically isolate its effects through controlled tasks, which limits the strength of conclusions about its role in shaping vowel realisations.

Recommendations

Based on these limitations, the following recommendations are proposed for pedagogical and research applications:

1. Pronunciation-focused instruction: English teaching in Kanuri contexts should place greater emphasis on explicit training in vowel length contrasts, central vowels, and diphthongs, which are typically absent in Kanuri.
2. Materials development: Locally adapted pronunciation materials, including minimal pair drills and auditory discrimination tasks, should be developed specifically for Kanuri-speaking learners to address phonological gaps.
3. Teacher training: English language teachers in northern Nigeria should receive training on common L1 interference patterns, particularly those involving vowel realisations, so that pronunciation errors can be diagnosed and corrected more effectively.
4. Integration of phonetic tools: Future studies and classroom practices should incorporate basic phonetic software (e.g., Praat) to visualise and reinforce segmental contrasts for learners.

Directions for Future Research

To build on the present study and expand its relevance, future research should consider:

1. Inclusion of female and less proficient learners to investigate whether gender and proficiency level influence the degree or type of phonological transfer.
2. Acoustic phonetic analysis of vowel realisations to complement auditory observations and improve reliability, especially in distinguishing vowel length and quality.
3. Comparative studies across dialects of Kanuri or with other Chadic languages (e.g., Ngizim, Bade) to identify whether the transfer patterns observed here are consistent across related linguistic systems.
4. Perception-based experiments to explore how Kanuri speakers perceive English vowels and whether perceptual accuracy correlates with production accuracy, aligning with models such as SLM and PAM-L2.
5. Longitudinal studies to track whether and how Kanuri learners' vowel production improves over time, and which instructional approaches lead to the most durable phonological gains.

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