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Utilising AI-powered Chatbots for Learning Endangered Nigerian Languages and Considerations for Their Development

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ABSTRACT

Younger generations in Nigeria increasingly use English over their native languages, leading to a decline in indigenous language use in public and professional settings and risking language loss. Consequently, this study explores the potential of AI-powered chatbots in aiding the learning of endangered Nigerian languages. The objectives are to determine how chatbots can support language learning, identify the essential functionalities required for effective learning, and outline design considerations to address the specific challenges faced by these languages. The research employs a qualitative approach, using secondary data from existing literature on language revitalisation, AI chatbots, and Nigerian languages. The analysis reveals that AI chatbots can significantly enhance language learning through features such as handling tonal distinctions and syntactic operations present or allowed in the languages, providing feedback, and engaging learners. Practical design considerations for developers include integrating these functionalities to create effective language-learning tools. These findings suggest that integrating AI technology into language preservation efforts can offer an innovative solution to revitalise endangered Nigerian languages and ensure their continued use among future generations.

Keywords: endangered Nigerian languages, AI-powered chatbot, language learning, language revitalisation, learner autonomy

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Introduction

What characterises our world today is by no means slow technological progress; instead, ingenious implementation of artificial intelligence (Belda-Medina & Calvo-Ferrer, 2022; Sanusi et al., 2023) has led to revolutionary changes in the field of human activities, including language learning (Annamalai et al., 2023) and preservation. Artificial intelligence for machines is a term that refers to the application of techniques that allow machines to imitate human intelligence (Azan Basallo et al., 2018). AI-driven chatbots, as highly complex advanced systems that can replicate human-like conversation using natural language processing and machine learning algorithms (Hallal et al., 2023; Haristiani, 2019), are a type of artificial intelligence that uses these techniques to grasp and respond to user inputs in a more intelligent and context-aware manner. These chatbots allow users to converse with AI, receive personalised feedback, and access relevant information on various topics (Fryer & Carpenter, 2006).

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Chatbots are used across diverse domains: customer service, virtual assistants, and educational applications (Keykubat, 2022; Liebrecht et al., 2020). Most chatbots were made to act as general-purpose ones (Fryer et al., 2020), while some were purposefully made for language learning (Alm & Nkomo, 2020).

According to Maikanti et al. (2021), Nigerian languages are endangered by urbanisation, globalisation, and the shift from using various languages to dominant ones such as English. Endangerment implies that the threatened languages could be lost soon entirely. Thus, it can be presumed that if a more arduous push is not made to record, preserve, and revitalise them by teaching them to children, many will shortly be wiped out in under 100 years. Chatbots converse with learners (Hussain et al., 2023), which makes learning a language interesting and enjoyable (Eisenring et al., 2024). As a result, learners gain confidence and develop fluency in the language they are learning (Li et al., 2022). Incorporating AI-powered chatbots for language learning is one of the innovative steps to ensure the vitality of Nigerian indigenous languages in this digital age. These chatbots can make language learning more accessible and interesting to the younger generation, who are more inclined to digital gadgets and tools. This research, therefore, aims to discuss the potential of Artificial intelligence-powered chatbots for learning endangered Nigerian languages and the factors to be considered when it comes to their development.

These research questions are put in place:

1. In what way can AI chatbots help the effort of learning endangered Nigerian languages?
2. What capabilities and functionalities of AI-based chatbots would be needed?
3. Taking into consideration the problems associated with endangered Nigerian languages, how can the AI-powered chatbots be designed?

Literature Review

Nigeria is a linguistically diverse country with over 500 languages (Udoh & Emmanuel, 2020), and the official language is English, spoken by 195.9 million people (Eberhard et al., 2020). The language has descended from the rule of British colonisation and serves as the language of delivery between the ethnic groups that live together. English is also heavily used in government, education, media, and commerce. Hausa, Igbo, and Yoruba have national status, and these languages are predominant among the northern, southeast, and southwest ethnic groups, respectively (Eberhard et al., 2020). They assume responsibilities for local administration and media in their respective territories. In addition to the national language, many other indigenous languages are spoken in the country, some of which have millions of speakers while others have small communities. Nigerian languages are threatened with various degrees of endangerment, with some considered endangered and others already extinct (Ikoro, 2019; Udoh & Emmanuel, 2020). Of the three national languages of Hausa, Igbo, and Yoruba, Igbo and Yoruba are now considered endangered. Endangerment reports related to the Yoruba and Igbo languages are common in various treatises. Aremu (2024) reports that a high percentage of Yoruba-English bilingual youths have a moderate ability in Yoruba, as their performance in various tasks was not satisfactory. The study indicates that many participants lack competence in Yoruba idioms, the counting system, days of the week, and months of the year. Also, many lexical and grammatical words are falling out of use. Similar to Aremu (2024), Adeniyi and Olaogun (2020) state that much of the language's vocabulary is lost due to a lack of usage. Idioms are rarely used, and the young are not conversant with them (Oyinloye, 2016). Fabunmi and Salawu (2005) argue that the high number of Yoruba speakers cannot save it from death and attribute the factors to language shift, rural-urban migration, globalisation, and the official language – English in Nigeria. The educated and elites among the Yoruba would switch to English for economic prospects, social elevation, and disgust for the language they now see as local. The Igbo language is dominated by problems such as a rapid decline in child competence, language shift towards pidgins, depletion of elderly monolingual speakers, marginalisation of dialects, and loss of idiomatic expressions and oral literary forms (Azuonye, 2002; Johnmary, 2012). Azuonye (2002) claims that with the widespread use of English among Igbo speakers, the language will likely become Creole or vanish entirely. Using an example from Onyemelukwe (2019), we see young people speaking Igbo less and not having it as a mother tongue. As Onyemelukwe reported, among them are negative attitudes, marginalisation, and disloyalty towards the Igbo, and the long-term effects are so devastating

– they include extinction within 40-50 years and cultural loss. Hausa is the only national language among the three that has not yet been listed among those endangered. Spoken in the north, Hausa is another language like English: the language is adapting. The aspiration for a "one north" unified view makes Hausa the lingua franca of the northern region, eclipsing over 200 indigenous languages (Igboanusi & Peter, 2004, p. 131). However, for Yoruba and Igbo, except Hausa, it is a fact that languages with a low number of speakers or poor institutional support are most likely to be endangered; languages without writing systems may face even more difficulties.

The measures used to conserve and enhance a language sometimes involve usage by speakers, documentation, description, archiving, revitalisation, media production, technology implementation, and other efforts (Udoh, 2022). The recommendatory suggestion of Udoh (2022) is the production of language apps that will facilitate learners to interact with different Nigerian indigenous languages. Udoh (2022) states that these language apps create a very accessible and easy-to-reach medium for learners to enrich their indigenous language skills; people can use the apps to learn indigenous languages more efficiently, and the younger generations, who are more familiar with technology, can familiarise themselves with these languages. Similarly, Galla (2018) states that digital technologies, through virtual modes of connection, can be powerful tools that bind and connect both speakers and learners from local and urban places, as well as rural villages, providing them with opportunities to be directly involved in local language revitalisation and education initiatives. Language apps can be a very effective alternative for people who want to learn languages (Karasimos, 2022; Kohnke et al., 2023) while attracting various communities in the process of reviving languages.

Chatbots are communicators (Li et al., 2022; Mohamed & Alian, 2023; Ruan et al., 2021), which make them a suitable choice as a language learning medium in two ways: as an aid to mastering a language and as an independent learning tool (Haristiani, 2019). They could be effective tools since their users will likely welcome them because of their convenience and the high level of confidence they inspire (AbuShawar & Atwell, 2015; Haristiani, 2019; Kim et al., 2019; Li et al., 2022; Ruan et al., 2021). Fryer and Carpenter (2006) and Sarosa et al. (2020) observed that chatbots improve participants' understanding of what they are learning and, unlike humans, perform these functions unobjectionably without any growing impatience over repeated materials. Along with these authors, others describe the same effects on reading and listening skills (Kim, 2019) and the knowledge of grammar (Kim, 2018). In research by Belda-Medina and Calvo-Ferrer (2022) on chatbot usage to support language learning, chatbots demonstrated efficiency.

Theoretical Framework

The theoretical framework for this study is Crystal's theory of language revitalisation. Language revitalisation focuses on returning a threatened language to use (Comajoan-Colomé & Coronel-Molina, 2021). According to Crystal (2000), an endangered language undergoes three stages, the first of which is when pressure from political, social, or economic sources forces people to adopt the dominant language. This pressure can come from top-down measures like government laws, incentives, and recommendations or bottom-up influences, like social trends. The culmination of the first stage is emerging bilingualism. This second stage (i.e., emerging bilingualism) means that language speakers become increasingly proficient in the new language while maintaining some competence in their native language. The decline of this bilingualism leads to the third stage, in which the younger generation becomes more proficient and identifies more with the dominant language. The old language becomes less relevant as parents do not actively use it, and children do not communicate using that language. Over time, this brings about semilingualism and eventually monolingualism, pushing the language towards extinction.

Crystal (2000) notes that it is impossible to influence the factors driving the first stage of language endangerment, and intervening in the third stage is too late for most languages. Revitalisation efforts should focus on the second stage, where emergent bilingualism offers a genuine opportunity for progress. Nigerian youths who are bilingual in English can be considered in the stage of emergent bilingualism. They are becoming increasingly proficient in English while retaining competence or a

moderate ability in their native languages (Adeniyi & Olaogun, 2020; Aremu, 2024; Azuonye, 2002; Onyemelukwe, 2019). Crystal (2000) identified electronic technology as one of the six key factors necessary for revitalising endangered languages based on his evaluation of successful language maintenance projects (Crystal, 2000, pp. 141-143). Using AI-powered chatbots for learning endangered languages can be considered among the electronic technologies that support language revitalisation, given that they can enhance the public profile of endangered languages and facilitate communication and learning among speakers, which aligns with the goals of language revitalisation efforts.

Methods

Research Design

The study utilises secondary data to investigate the potential and requirements for AI chatbots in learning endangered Nigerian languages. According to Vartanian (2010), secondary data consists of previously collected information being reused to address new research questions. The secondary data is derived from existing literature on language learning, AI-powered chatbots, and efforts to revitalise endangered languages.

Research Instrument

Secondary data was used in this study. This includes a comprehensive review of existing studies and literature relevant to language revitalisation, AI-powered chatbots, and the challenges that endangered Nigerian languages face.

Data Collection Procedures

Relevant secondary data was extracted from their sources. Existing studies and literature on language revitalisation, AI-powered chatbots, and the specific challenges faced by endangered Nigerian languages were collected for review, analysis, and discussion.

Data Analysis Procedure

The information gathered from the literature was analysed to identify the necessary capabilities and functionalities of AI-powered chatbots for learning endangered Nigerian languages, such as handling tonal distinctions and complex syntactic operations present or allowed in the languages, providing feedback, and maintaining user engagement. In addition to this, a hypothetical learner interaction with a chatbot, which was used as an illustrative example in the study, to demonstrate the potential chatbot responses and feedback mechanisms based on the findings from previous studies, was discussed under the discussion section.

Way in Which AI Chatbots Can Help the Effort of Learning Endangered Nigerian Languages

First, for a language to be preserved from danger, it must be actively spoken. However, when a language is endangered, the only way it can be revived is with the help of a more knowledgeable individual teaching the language. This is so given that linguists' efforts in archiving, recording, and documenting a language provide an avenue for an endangered or a dead language to be revived; thus, such a revival necessitates teaching and learning. For one who is learning a language as a beginner, the teaching begins with knowing the sounds that are obtainable from the language, the vocabulary, conversational phrases, how meanings are derived, how words are created, the culture, and all the things that are unique to it.
Chatbots can assist in language preservation by serving as language learning and practice tools, maintaining and promoting language use through features like text, audio input and output, and visual aids. In fact, when multimedia resources are incorporated, a language and its culture are brought to life. Audio recordings featuring native speakers allow learners to hear the language being naturally spoken, enabling them to develop listening comprehension skills and acquire pronunciation and intonation patterns appropriately. Similarly, videos depict visual representations of cultural practices, traditions,

and societal norms. It can be traditional celebrations, everyday interactions, or historical events, as can be seen in the case of the Memrise language learning app, which incorporates video clips of native speakers where learners observe how native speakers articulate utterances, their intonation, and the emotion associated with each word (Kyung, 2019). As Mohamed and Alian (2023) noted, chatbots track learners' progress, identify areas for improvement and offer appropriate feedback to help them. All these are what each learner needs; they help learners advance their proficiency levels (Galla, 2018; Kwon et al., 2023). The following is an illustrative example of a hypothetical learner interaction with an AI chatbot for language learning. The chosen Nigerian language here is Yoruba.

Note. A learner named Fadekemi, with a basic understanding of Yoruba, is using an AI chatbot named ORO for language learning. The chatbot is designed to teach different times of the day in Yoruba, how to greet accordingly, and quiz learners based on what they have learned (See Table 1 and Table 2 in Appendix A). The chatbot also teaches conversational Yoruba (See Table 3 in Appendix A). The learner can read, listen to, speak and/or write her messages.

Specific Needed Capabilities and Functionalities of AI-powered Chatbots for Learning Endangered Nigerian Languages

AI-powered chatbots can enhance language learning by being responsive, secure, and culturally sensitive while also serving as effective language learning tools (Abdulquadri et al., 2021; Haristiani, 2019; Kim et al., 2019; Teibowei & Agbai, 2023). As far as Nigerian languages are concerned, chatbots designed for language learning must be able to handle language-specific features. For instance, Nigerian languages are largely tonal (Crystal, 1987). Tone is a suprasegmental feature where identical words could be differed by contrast in the pitch of the voice (Uba & Eme, 2019). Consequently, a chatbot designed for learning a tonal language must be able to handle tonality as it lexically and grammatically marks contrast between words, interrogative, and declarative expressions (Okoye & Osuagwu, 2017; Uba & Eme, 2019). A learner who encounters words of the same form being pronounced differently and having different interpretations without any physical marks distinguishing them would undoubtedly be confused. Tone marks are necessary to prevent such confusion (Alake, 2000). The following examples from various Nigerian languages illustrate how words of the same form differ in meaning because of the difference in the pattern of tone attached to them.

Yoruba

a	Word	Tone	Gloss
	Ìgbà	LL	time
	Igbá	MH	calabash
	Ìgbá	LH	Mature pod of *parkia biglobosa* tree
	Igba	MM	200
	Igbà	ML	Rope for climbing palm tree
b	Ajá	MH	Dog
	Àjà	LL	Roof
c	Agbon	MH	Insect
	Agbon	ML	Basket
	Agbon	LM	Coconut

Nyifon

a	Word	Tone	Gloss
	Achi	MM	Poison
	Àchi	LM	Medicine

b	Ùkè	LL	Song
	Ùke	LM	Door
c	Ba	M	Draw
	Bà	L	Wait
d	Teme	MM	Remove
	Tème	LM	Wrap up
e	Iji	MM	Food
	Ìji	LM	Vein

(Uba & Eme, 2019)

Igbo

a	Word	Tone	Gloss
	Àkwa	LM	Egg
	Akwa	MM	Cry
	Àkwà	LL	Bed
	Akwà	ML	Cloth
b	Aka	MM	Hand
	Akà	ML	Bead
c	Òkè	LL	Share
	Okè	ML	Boundary
	Oke	MM	Male
	Òke	LM	Rat
d	Enyi	MM	Elephant
	Enyì	ML	Friend

(Okoye & Osuagwu, 2017; Uba & Eme, 2019)

Etulo

a	Word	Tone	Gloss
	Gbò	L	Fail
	Gbo	M	Beat
b	Atse	MM	Comb
	Àtse	LM	Mate
c	àbê	L, Falling tone	Breast
	Àbè	LL	Name

(Okoye & Osuagwu, 2017)

While Nigerian languages, like English, typically use SVO (Subject-Verb-Object) word order, several aspects are unique to these languages. A typical example is Yoruba, in which adjectives generally post-modify nouns (Adelabu, 2014), as shown below:

a. *Omobinrin* *dudu* *kan*
Lady dark one
(A dark lady)

b. *Ile* *giga*
House tall
(A tall house)

There are a few exceptional cases where adjectives come before the nouns they modify. These cases include:

1. When stating a special feature of a person or thing (Adelabu, 2014):

a. *Arúgbó* *okùnrin*
Old man
(An old man)

b. *Àjòjì* *ènìyàn*
Strange person
(A strange person)

2. When expressing a fraction (Adelabu, 2014):

a. *ìdájí* *àpò* *ìrẹsì*
Half bag rice
(A half bag of rice)

b. *ìlátà* *ìgò* *èpò*
One-third bottle oil
(A one-third bottle of oil)

Within these exceptions, it is allowed for some adjectives to come after the nouns they modify:

1a. Idaji apo iresi ⟷ 1b. iresi idaji apo
Half bag rice rice half bag
(A half bag of rice) (A half bag of rice)
(Both ‘a’ and ‘b’ are the same)

The 2a below is an example from exceptional cases. However, unlike 1a, adjectives cannot come after the nouns they modify:

2a. Obun omo ⟷ 2b. *omo obun
Dirty child child dirty
(A dirty child) *(A dirty’s child)

Unlike 1a and 1b, which both mean the same thing, 2a and 2b do not. In 2b, the adjective 'dirty' becomes a noun that functions as possessive when it switches position with or crosses over 'omo'. This is not allowed in the grammar of the language. It is more of a matter of syntax and semantics.

How AI-powered Chatbots Can Be Designed Taking into Consideration the Problem Associated with Endangered Nigerian Languages

Many Nigerian indigenous languages are not codified (Owojecho, 2020). Despite these languages' abilities to foster unity, cultural identity, and national pride (Ayakoroma, 2017), their role in national development is hindered by a lack of orthography (Olaoye, 2013). This makes preserving linguistic knowledge and cultural heritage challenging for future generations. Even among languages that have a writing system, a lack of standard dialect is another problem; this is true of a language like Igbo where, essentially, the idea of a standard Igbo dialect exists, but its concrete existence or specific characteristics are not easily identifiable with within the diverse Igbo community (Anyanwu, 2013).

To design a chatbot that can address the lack of orthography or description of many Nigerian indigenous languages, insights can be drawn from studies by Chiaráin and Chasaide (2016) and Paul et al. (2018). Chiaráin and Chasaide note that a speech-enabled chatbot is a powerful tool for dealing with the challenges of teaching and/or learning an endangered language where learners have limited access to native speaker models of the language and limited exposure to the language in a truly communicative setting. In their study, the chatbot uses synthetic voices developed for the dialects of Irish and aims to provide a learning environment that incorporates speech. The chatbot platform was evaluated in 13 schools, where the learners' opinions of the platform "as a learning environment" and the quality and attractiveness of the synthetic voices were assessed (Chiaráin & Chasaide, 2016, p. 3432). The quality of the synthetic voices had 73% positive rating, whereas the attractiveness of the voices received 57% rating. Paul et al. (2018) proposed a semi-supervised AI chatbot for automating interaction to generate contextualised responses in any language without relying heavily on rich NLP background, or extensive prior datasets. Practically, they created a chatbot framework suitable for resource-poor language like Bangla and found that using N-Gram stemming alone maintained performance without heavy NLP methods, while a convolutional neural network improved query identification. Context tracking using LCA was reported to be excellent in maintaining the flow of conversation. Although a chatbot with an architecture like this cannot handle features such as tone, intonation, and complex grammatical rules, it can be considered a good start, considering its suitability for basic language learning or use (such as vocabulary and other simple conversation skills, particularly for beginners).

Discussion

It has been established that chatbots can assist in language preservation efforts by serving as tools for language learning and practice, maintaining and promoting language use through features like text, audio input and output, and visual aids. An example is given in Tables 1, 2, and 3 to illustrate this. The example is the hypothetical interaction of a learner with an AI-powered chatbot. It is a fictional situation demonstrating a learner's and a chatbot's interaction. This demonstrative part shows how the chatbot reacts to the trainee's contribution, provides the expected feedback, and how they all lead to curiosity. In Table 1, Fadekemi learns about the different times of the day in Yoruba and how to greet accordingly. The quizzes in the second interaction (Table 2) reinforce the learning. Positive reinforcement through praise motivates Fadekemi to continue because it builds confidence in what she has learned. Fadekemi practised what she had learned in Table 3. Her question about the weather is outside the learning objectives, but the chatbot effectively handles it by responding to it and letting her know she is going out of the scope of learning and that the topic can be learned next time. In these interactions, it can be seen that the chatbot personalises language learning. That is, it provides the feedback that the learner needs, and there is room for exercises, opportunities for the practical application of what a learner has learned, and absolute control over what they are learning.

Regarding the capabilities and functionalities of AI chatbots that would be needed, Nigerian languages are syntactically rich and largely tonal. Any chatbots designed for learning the languages should be able to handle tonal distinctions and complex syntactic operations that are present or allowed in the languages. If the syntax is poor, the chatbot cannot serve its purpose. In the same way, the tonal aspect

has to be perfectly fixed to avoid mistaking one word for another, which can lead to misinterpretation, as shown in the given examples. In other words, the chatbots should be able to handle tonal distinctions and complex syntactic operations, and this is essential because tonal distinctions and complex syntactic operations are critical components of Nigerian languages. Properly managing these features ensures accurate communication, comprehension, and effective learning.

Taking into consideration the problem associated with endangered Nigerian languages, which is lack of codification or description, Chiaráin and Chasaide (2016) and Paul et al. (2018) show that undocumented languages can incorporate a speech-enabled feature to provide access to native speaker models or utilise a semi-supervised AI chatbot which generates contextualised responses in any language without relying heavily on rich NLP background, or extensive prior datasets. While the latter may not be a comprehensive solution due to its inability to handle sophisticated language features, it certainly offers a meaningful contribution to language learning. It should be noted, however, that while chatbots may not possess human-like intelligence (Chomsky et al., 2023), they can guide learners in these activities through the training they have received from their developer(s).

Conclusion

Using AI-powered chatbots to learn endangered Nigerian languages is an innovative approach to addressing Nigeria's critical issue of language preservation. Chatbots can support this effort by acting as tools for language learning and practice, offering functionalities such as text and audio input/output and visual aids. These chatbots must be capable of managing language-specific features, including handling tonal distinctions and complex syntactic operations, which are crucial for accurate communication and comprehension. A major problem with many Nigerian languages is the lack of documentation. However, speech-enabled chatbots can be valuable in contexts with limited access to native speakers. Semi-supervised AI chatbots can generate contextualised responses in any language without heavily relying on an extensive NLP background. The limitation of this study is that language learning through chatbots is restricted to educated individuals with access to technology. Despite this, integrating AI-powered chatbots into language learning initiatives can offer practical solutions for revitalising endangered Nigerian languages. These chatbots can facilitate language learning and potentially preserve and promote these languages among current and future generations. Stakeholders involved in language preservation efforts should consider incorporating AI chatbots with features that address endangered Nigerian languages' unique linguistic characteristics and challenges. Future research should focus on developing systems equipped with the functionalities and considerations discussed in this study.

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Conflict of Interest

The author has declared that no competing interests exist.

Author Contribution Statement

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Appendix A

Table 1
Timing of a Day

Interaction in Yoruba	English Translation
ORO: Ǹlẹ́ o Fadekemi! Emi ni ORO, olùrànlọ́wọ́ ẹ̀kọ́ Yorùbá rẹ. Lónìí, jẹ́ kí á kọ́ nípa àwọn àsìkò tí ó wà nínú ọjọ́.	ORO: Hi Fadekemi! I'm ORO, your Yoruba learning assistant. Today, let's learn how to greet people in Yoruba.
Fadekemi: Ǹlẹ́ o ORO!	Fadekemi: Hi ORO!
ORO: Ó dára! Yoruba pín àsìkò tó wà nínú ọjọ́ sí ìpín méje: (1) Àárọ̀/Òwúrò (2) Ìyálẹ̀ta (3) Ọ̀sán (4) Ìrọ̀lẹ́ (5) Alẹ́ (6) Àfẹ̀júmọ́ (7) Àjìn/Òru	ORO: Great! Yoruba categorises the day into seven periods: (1) Morning (2) Noon (3) Afternoon (4) Sunset (5) Early night (6) Dawn (7) Midnight
Fadekemi: Ó dára! Sugbon eléyìí jẹ́ àjòjì. Àárọ̀, ọ̀san, àti alẹ́ nìkan ni mo mọ̀.	Fadekemi: Great! But this is strange! I've always known morning, afternoon and night.
ORO: Wọ́n lè jẹ́ àjòjì nítorí i àìsàmulò wọn. Dájúdájú o nífẹ́ẹ́ láti kọ́ ohun tuntun.	ORO: They may be strange because they are rarely used. Knowing and using them will give you an edge. You definitely like to learn new things.
Fadekemi: Bẹ́ẹ̀ ni!	Fadekemi: Yes!
ORO: Ó dára! Ìwọ̀nyíí ni bí o ṣe lè lo ọ ìkọ̀ọ̀kan àwọn ọ̀rọ̀ náà ní àsìkò tí ó tọ́:	ORO: Great! Here is how you can use each word in greeting at a specific time:
1. Ẹ kàárọ̀ (Lọ́gán tí òòrùn bá tí yọ). 2. Ẹ kú ìyálẹ̀ta (Ní dédédé aago méjìlá ọ̀sán). 3. Ẹ káàsán (Ago kan sí ago mẹ́rin ọ̀sán). 4. Ẹ kú ìrọ̀lẹ̀ (Ago méje alẹ́). 5. Ẹ káalẹ́ (Ìkíni lẹ́yìn ago méje alẹ́). 6. Ẹ kú àfẹ̀júmọ́ (Ago márùn-ún sí àgó mẹ́fà àárọ̀) 7. Ẹ kú àjìn (Àárín òru)	1. Ẹ kàárọ̀ (Greting after early sunrise). 2. Ẹ kú ìyálẹ̀ta (Greeting during the noon "12pm"). 3. Ẹ káàsán (Greeting from 1pm to 4pm) 4. Ẹ kú ìrọ̀lẹ̀ (Greeting at 7pm). 5. Ẹ káalẹ́ (Greeting after 7pm). 6. Ẹ kú àfẹ̀júmọ́ (Greeting at 5 to 6 am). 7. Ẹ kú àjìn (Greeting at midnight).
Fadekemi: Ó dára!	Fadekemi: Okay!
ORO: Ríi dájú wípé o kò si Ẹ kú ìrọ̀lẹ̀ àti Ẹ káalẹ́ gbé sí ara wọn.	ORO: Make sure you don't confuse greeting at 7 pm with greeting after 7 pm.
Fadekemi: Tí n kò bá fẹ́ dárúkọ àsìkò ń kọ́? O jọ wípé kò sí ìkíni irú u rẹ̀.	Fadekemi: What if I don't want to mention time? It seems there's no general greeting.

ORO: Rárá, ìkíni irú rẹ̀ wà. Sọ pé "Ẹ kú dééédéé ìwòyí" tí o kò bá fẹ́ dárúkọ àsìkò. Ìkíni tí ó ṣe é lò ní àsìkò yòówù ni.	ORO: No, there is. Say “Ẹ kú dééédéé ìwòyí” if you don't want to mention the time. It is a versatile greeting that can be used throughout the day.

Table 2

Practicing with Quizzes

Interaction in Yoruba	English Translation
ORO: Ní sìn ín, jẹ́ kí á ṣàgbéyẹ̀wò ìmọ̀ rẹ. Báwo ni a ṣe ń kíni ní dééédéé aago méjìlá ọ̀sán?	Chatbot: "Now, let's test your knowledge! Which greeting would you use at 12pm?"
Fadekemi: (Mú “Ẹ kú ìyálẹ̀ta” nínú àwọn ìdáhùn).	Fadekemi: (Selects “Ẹ kú ìyálẹ̀ta” from a multiple-choice quiz)
ORO: Ìyẹn tọ̀nà. Ọlọ́pọlọ́ pípé ni ẹ́, Fadekemi. Tó bá jẹ́ àjìn ńkọ́?	ORO: "Correct! You're a fast learner, Fadekemi. How would you greet if it is midnight?"
Fadekemi: (Mú “Ẹ kú àjìn” nínú àwọn ìdáhùn).	Fadekemi: (Selects “Ẹ kú àjìn” from a multiple-choice quiz)
ORO: O káre, Fadekemi! Báwo la ṣe ń kí ni lẹ́yìn ago méje alẹ́?	ORO: "Fantastic job, Fadekemi! How do you greet after 7pm?
Fadekemi: (...).	Fadekemi: (...).

Table 3

Conversational Yoruba

Interaction in Yoruba	English Translation
ORO: Kú ìṣe, Fadekemi! Ní sí-ín yìí, o lè kí àwọn àníyàn ní èdè Yorùbá. Tá ni o máa fẹ́ láti kọ́kọ́ kí?	ORO: Great work, Fadekemi! Now you can greet people in Yoruba. Who would you like to say hello to first?
Fadekemi: Máa fẹ́ láti kí ọ̀rẹ́ mi Daniel.	Fadekemi: I'd like to greet my friend Daniel.
ORO: Ìyanu ńlá lèyí! Ǹjẹ́ kí á ṣàgbéyẹ̀wò ìtàkurọ̀sọ kékeré? Àpẹẹrẹ nìyí: "Inú mi dùn láti rí ẹ, Daniel! Báwo ni?	ORO: That's wonderful! How about we practise a short conversation? Here's an example: 'I am happy to see you, Daniel! How are you?
Fadekemi: Inú mi dùn láti rí ẹ, Daniel! Báwo ni?	Fadekeni: 'I am happy to see you, Daniel! How are you?'"
ORO: Ó dára gan-an. Nísin yí, ìwọ lo kàn láti bèrè ìbéèrè lọ́wọ́ Daniel. Kí ni o wù ọ́ láti mọ̀?	ORO: Very good! Now, it's your turn to ask Daniel a question. What would you like to know?

Fadekemi: Báwo ni ojú ọjọ́ lónìí?	Fadekemi: "How is the weather today?"
ORO: ìbéèrè ńlá nìyẹn, Fadekemi! A kò tíì kọ́ nípa ojú ọjọ́. Ṣùgbọ́n mo lè sọ fún ẹ pé òrùn mú lónìí. Bóyá a máa nípa àwọn ọ̀rọ̀ tó jẹ́ mọ́ ojú ọjọ́ lọ́jọ́ iwájú.	ORO: "That's a great question, Fadekemi! While we haven't learned about weather phrases yet, I can tell you it's a sunny day. Perhaps we can learn some weather vocabulary next time?"

Note: Table 3 is a continuation of a conversation between ORO and Fadekemi. The interaction starts like the opening of Table 1. A similar opening is not provided in Table 3 to avoid the repetition of similar information ad nauseam – the opening is actually predictable for and in various contexts and can be taken as a template.