Developing computer related terms in Nigerian languages: A suggestion for Hausa

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Abstract
The current spate of scientific and technological advancement in the areas related to computer should correspond with the development of Nigerian languages to meet the challenges of computer literacy. The development should emphasize provision of terms. The position of this paper is that experts in Hausa should exploit the system of borrowing in the provision of the terms; particularly loan is a better option. This is because many scientific and technological terms take after the names of their inventors or arise from peculiar contextual circumstances and consequently become untranslatable. This will avert the realization of unproductive terms, terms that take a long time to be assimilated into the lexicon or remain relevant only in the pages of books, and may lack implications for modernism.

1.0 Introduction

For any language to be standardized and developed, certain factors are considered which largely depend on its planners and users. This is done by the planners of the language and is usually through a collective effort. Language planning is also seen as a problem solving activity. A well developed and standardized language is one that is used freely in all the functions that language serves in the society in question. A standard language refers to a language which has a widely accepted norm and is felt to be appropriate, and used for all purposes for which language is used.

Language development (through planning) can be seen as a functional concept, one which relates to the role of a language in the society in which it is used. Kreindler (1979) contends that language planning requires the creation of alphabet, the coining of new words and the compilation of dictionaries and grammars. This could be a process by which terms can be developed in a given language.

Language planning and or development is directly associated with the political, economic, scientific, cultural, and or religious situations. It is also directed at smaller

aggregates like ethnic, religious, and occupational groups. Language planning refers to deliberate efforts to influence the behaviour of others with respect to the acquisition, structure or functional allocation of their language codes (Cooper, 1989).

2.0 Scientific approach to Nigerian language development

Experience has shown that the promotion of the scientific and technical vocabulary of a language is based on organized, dedicated multi-disciplinary work. Accordingly, terminological issue was raised relating to a common research on Nigerian languages for scientific and technological vocabulary. The development of Nigerian languages' technical terms was embarked upon between early 70s and late 80s, in order to find a lasting solution to some problems, which have prevented uniformity in the effective teaching of the languages. This is where, for instance, it was observed that a single Hausa term can be expressed in different ways because of the many existing dialects within the language.

Like in many languages of the world, technical terms in Nigerian languages are obtained sometimes as a result of borrowing from other languages (Ndukwe, 1987). A great deal of useful work on the development of terminologies in Nigerian languages has been, and is still being, done by the different agencies and bodies engaged in the exercise for terminological development. Such agencies and bodies include, among others, Hausa Language Board of the Ministry of Education, Northern Region, Kaduna; Society for Promoting Igbo Language and Culture (SPILC); Igbo Standardization Committee (ISL); Institute of Education, Ahmadu Bello University (ABU), Zaria; and the Nigerian Educational Research and Development Council (NERDC). Most of the terms that are now in use in some Nigerian languages are a derivation of the work of some societies that have provided them for science and technology (for primary schools), language and linguistics, literature and a number of other subject fields.

Commenting on the relevance and importance of glossaries of scientific and technological terminologies to the delivery of medical services in Nigeria, Obasi (1995) points out that the success of health services depends on good communication between the professionals and the consumers of medical services. This is to say that language can have either a negative or positive influence on medical health care delivery depending on how appropriate technical terms are provided in Nigerian languages. Aaron (1981), as cited in Nuhu (1998), observes that technical/medical language of doctors normally results to poor communication and in the end confuses patients. Hence, if adequate and appropriate terminology work is enhanced through

the most appropriate bodies, some, if not all, of Nigeria's linguistic problems could be solved, gradually. At the moment much work is only done in this regard on the three major Nigerian languages. Explaining how the work on terminology development on Hausa, Igbo and Yoruba was successfully carried out, NERDC (1991) says:

> The various contributors have used several techniques in producing this work. These techniques include coinage, semantically or otherwise motivated; affixes; composition in accordance with monopoly of each of the three languages, description of the three languages; description of the references as it can be visualized or imagined by the speakers of these languages, translations, extension of meanings; borrowing of references; adoption of the references to fit into the phonology and morphology of the languages. Words used have to enjoy acceptability, harmonization, uniformity and consistency in their orthography.

There are works on metalanguage, published in the three major Nigerian languages by the Federal Ministry of Education through NERDC. The works include 'Yoruba Metalanguage/Ede Iperi Yoruba' (1984); 'Tsarin Kamus na Kebabbun Kalmoni na Ilmin Harsuna da Adabi' (1989); and 'Okaasusu Igbo or Igbo Metalanguage' (1989).

Brann (2006) has observed that in the creation of terminologies in the area of the natural sciences, it would be desirable to make loan adaptations the chief means of enrichment and innovation for languages. He says that this is because it is in this area that the increase in knowledge has the largest international currency. In addition, the natural sciences by their nature serve development through maximum international communication.

In all these issues as to how to develop the Nigerian languages by, among other things, providing adequate and proper metalanguage for use by the people; and all the efforts already put in and the successes so far recorded, it is our view that better and rapid results would be attained if computer is put to appropriate use in these language endeavours.

3.0 The role of computer in language development

It is a fact that the world is now in an era of information age, the computer age; a dispensation where technology is fast advancing. This is why we see everything and every field of study, including linguistics in the development of languages, keeping

pace with this technological development around the world. According to Lawal and Abdullahi (2004), computers have their most profound influence on all areas of knowledge and disciplines. Computer is capable of examining and adjusting the number of different variables before producing an optimum result. The computer could simply be seen as an electronic device that accepts data, processes the data and produces a meaningful result or information for its user. For Lawal and Abdullahi (2004), it is also a device which may be mechanical, magnetic, electrical or electronic in nature, and which accepts data in a way as input, processes the data according to instructions (program) given and produces meaningful output (information).

Generally speaking, development is viewed as modernization on existing status so as to meet targets on the model. Linguistically therefore, such developments could be seen in terms of modernizing the ways in which we expand the existing theories of language via the use of computer today. In the past, the study and development process of a language was no more than in the grammatical aspect. That is looking at language under study in terms of its subject, verb and object in the analysis of sentences. Gradually, the process moved to the stage of transformation and much later to generative transformational stage. Today language development process has, after passing through other various stages, reached the stage of the use of computers. For instance, the computer has the ability to correct the grammatical structure of any language, Nigerian languages inclusive, depending on the type of linguistic software installed.

In a well developed modern language laboratory one finds such modern computerized equipment. This equipment is programmed in such a way that they help both the teacher and the learner to arrive at, for example, good pronunciation of some speech sounds and words that are input to the computer. In this laboratory, a phonetician or a phonologist can carry out acoustic investigations of sounds. This enables him get the accurate pitch and formant features of the sounds in a matter of seconds. He can even compare the different phonetic features of different sounds and syllables; and do a lot of other things with speech sounds, syllables, morphemes, words, phrases, clauses and sentences. Without the computer, achieving these could take many stressful hours.

Similarly, computers are capable of correcting and giving an alternative option where necessary, provided the needed language/dialect is specified in the appropriate computer instruction. For instance, if in typing *na'ura mai kwakwalwa* – the Hausa word for "computer"- and the typist mistakenly types *na'ura mai kwakwawa*, the computer will automatically notice this omission of the letter 'l' in the word. Other

Hausa examples which could involve specifying the dialect are typing *yâará* for 'children' when the correct thing is *yâaráa*; *shàà* for 'to drink' when the right thing is *sháá*. The computer will point out the omission of *'a'* in the first word and the placing of low tones instead of high tones on the second word; provided appropriate instruction is given to the computer concerning the dialect involved. Also, take the case of such software like 'Encarta' dictionary, where the user is at the liberty of having the complete International Phonetic Association (IPA) chart, correct spellings, pronunciation guide, etc to aid his research endeavours. There is also the 'Konyin' keyboard for Hausa, Igbo and Yoruba. They have enhanced publication of different reading and study materials in the Nigerian languages, as publishing in them is now made very much easier than what the situation used to be some few years ago.

Also, language experiments with the Nigerian languages can easily be carried out by the use of the computer. These activities could be employed in the analysis and development process of Nigerian languages. In the said experiments, computers can be used to control, monitor and record data and carry out preliminary analysis. Computer experiment provides precision and rapid measurement where more than human response and accuracy are needed (Lawal & Abdullahi 2004). This role of the computer in the development of languages explains the recent rapid development in language studies and research. Indeed, this is a welcome development and it supports the assertion that the computer is an indispensable tool for all human development. Undoubtedly we are in the computer age where virtually every thing is now being taken over by the computer. This is true considering the vital role the computer has been playing and will continue to play in all the aspects of human endeavour.

4.1 Developing computer terms in Hausa

There is no doubt that every language of the world has its own way of operation. As a result and in order to develop languages so as to attain modern status, some processes are employed. With regard to the above, I would like to briefly discuss only one which I consider more important in the development of the Hausa language.

4.2 Borrowing process

Borrowing as an aspect of language development, plays a significant role in Hausa phonology. In its phonological structure, the Hausa language does not have consonant cluster but what is referred to as abutting consonants. This is a situation where the final consonant of the preceding syllable shares boundary with the initial consonant of the following syllable in a word. Words borrowed into the language always undergo some phonological changes in order to fit into the system of the language.

Salim (1981) says, "As an alternative to vowel insertion (and in some cases, as a variant of it), English loan words with syllable initial consonant cluster, where the second consonant is /r/ or has been adjusted to Hausa /r/, may undergo metathesis where /r/ is shifted to the back of the following vowel thus creating a closed syllable CVC i. e. CRV→CVR" as in the following examples:

(1) English	Metathesized term in Hausa
propeller	farfeela
propaganda	farfaganda
gramophone	garmahoo
fridge	firjii
Christmas	Kirsimeeti
break	birkii
bricklayer	birkila

It is our view that by the facilities provided by the computer, more and more borrowed terms can find their way into the language thereby leading to its further lexical and terminological development.

With the world's fast technological and scientific changes and advancement, it becomes imperative for languages to be developed in order to cope with these changes. This is true if we consider such works connected with the Internet that produced facilities like 'Google', 'Yahoo, etc. Included are software and hardware systems associated with computers and related systems like handsets. These facilities could be configured to use the three major Nigerian languages, Hausa, Igbo and Yoruba as some of their languages of operation: a situation that is unworkable if there are not adequate terminologies. Borrowing lends possibility to this.

However, when borrowing, experts must ensure that the borrowed items define the phonology of the Hausa language. In other words, the terms must be indigenized to reflect the Hausa phonological system. This is exemplified below with borrowed terms in such areas of study as Physics, Chemistry, and Biology:

(2) Hausa	English
santimita	centimeter
kulorin	chlorine
benzofirin	benzopyrene
inzima	enzyme

Notice that we are not in support of any other process of development of terms (for instance, coinage) because scientific terms are unique in many respects. Particularly, they sometimes take after the names of their inventors or arise from peculiar contextual circumstances and consequently become untranslatable. The following is evident of this fact:

(3) Hausa	English
kwamfyuta (na'ura mai kwakwalwa)	computer
farlilogiram	parallelogram
firisma	prism
rombus	rhombus
tirafiziyam	trapezium

5.0 Conclusion

The advent of computer has tremendously helped in the development of languages across the world. Nigerian languages should benefit from this. How do they; according to this paper, by borrowing such terms that are related to the computer? May we note that there are different types of borrowing: loan, loan-blend, and loan translation which Ndimele (2001:64) also calls calque. Loan provides the exact terms from the donor language, but with application of indigenization; loan blend provides terms that have the morphological material of both the donor, and recipient language, while loan translation provides terms that represent the translation of the donated terms in the recipient language. Our position therefore is that experts in Hausa should exploit these provisions in developing computer related terms but should exploit loan most because many scientific and technological terms take after the names of their inventors or arise from peculiar contextual circumstances and consequently become untranslatable. This will avert the realization of unproductive terms, terms that take a long time to be assimilated into the lexicon or remain relevant only in the pages of books, and may lack implications for modernism.

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(2) a. Nye m mmiri 'Give me water'
b. O gara nke oma 'It went well'

Refer to numbered items as 2. 2a, 2a, b, 2(a-c). Align word for word or morpheme by morpheme glosses of example phrases or sentences with the beginning of each word:

(3) Ada si na ya ga-abia.
Ada say that she will come.

Place a hyphen between morphs within words in the original and a corresponding hyphen in the gloss:

(4) fog-okfel próbál-ni olvas-ni
will-1sg try-inf read-inf

If one morph in the original corresponds to two or more elements in the gloss (cumulative exponence), separate the latter by a period, except for persons; there is no period at the end of word:

(5) es-tis be-2PL.PRES.IND.ACT

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