

ICT APPLICATION FOR TEACHING ARABIC SIGN LANGUAGE TO NON-ARABS PERSONS WITH HEARING IMPAIRMENT IN AN INCLUSIVE SETTING IN NIGERIA



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ABSTRACT

Information Communication Technologies is the Reliable tool for teaching Arabic Sign Language to Non-Arabs persons with hearing impairment particularly in Nigeria. The journey of inclusive setting is also the best plan in uplifting the interest by the hearing impaired individual. However, Arabic Sign Language is a pilot on paving the way for the persons with hearing impairment people in understanding not only the communication using Arabic, but the total way to comprehend the messages and provisions of Islamic knowledge. This paper dwells on concept of ICT and its applications, sign language and Arabic sign language, hearing impairment, Non-Arabs persons with hearing impairment individuals and inclusive setting. The article is also provide the applications of ICTs on teaching the concept of Arabic Sign Language to persons with hearing impairment, availabilities, adequacy, utilization and advantages of devices. The paper concluded with the importance of teaching Arabic sign language to individuals with hearing impairment, the problems faced by persons with hearing impairment in an inclusive setting. Finally, recommendations were made on how to teach Arabic Sign Language to the hearing impaired individuals using Information Communication Technologies in an inclusive setting in Nigeria.

Keywords: ICT, Arabic Sign Language, Non-Arabs Persons with hearing impairment and inclusive Setting.

Introduction

Information and communication technology (ICT) is a wonder of the Twentieth century and is still a wonder in the current twenty first century. The zenith its of wonder is seen in e-finance which financial transactions are done digitally with great speed and accuracy, imagine the withdrawal of money via Automated Teller Machine (A.T.M) as soon as A.T.M card (Diso & Danlami, 2018). Therefore, the world of education is currently undergoing a massive transformation as a result of the digital revolution”. This implies that, digital revolution is both important and practical to make use of the availability and accessibility of the technology in designing educational or training programs. Information and communication technology (ICT) are various devices whose aim is to help persons with special needs education/rehabilitation to better function in daily life to attain a higher quality of life.

More than two hundred million inhabitants of African continent speak Arabic as native language. A significant proportion of them are persons with hearing impairment, causing several communication gaps with one another and also with people who speak the language. For this reason there are a set of sign language called Arabic sign language (ARSLs), but unfortunately ARSLs is still at the developmental stage. Interaction between a “Deaf” community and a hearing one is minimal and is basically concentrated around families with “deaf” members, relatives of the deaf, and sometimes play friends and professionals, for this a need appeared to unify Arabic sign language in all Arab countries. This drove the Council of Arab Ministers of Social Affairs (CAMSA) to take a decision of developing a unified Arab sign language dictionary and publish it to all countries, in an attempt to help Arabs with hearing impairment to have a common language in addition to their local language. To cope with these problems, it’s important to encourage little children with hearing impairment to learn the Arabic sign language, which will standardize communication despite the existence of different lanuages in the Arab world. For this reason the best way to teach this language is the learning via various programmable Applications of ICTs for developing a soft ware that will execute and provide solution to the problems. In addition the integration of input devices like “kinect, leap motion controller, etc.” will allow this segment of special users to pass a good and beneficial based on the gestures of their hands (Mohammed, Amine and Lotfi, 2014). They further added that, nowadays the contribution of ICTs has been recognized worldwide as they improve the quality of life of people with disabilities; they reduce social exclusion, and strengthen their participation in society. They added that, According to the Council of the European Union, many European countries have adopted policies that include the use of ICTs, to promote equality in education and the inclusion of people with disabilities in the information society. The UN Convention on the Rights of Persons with Disabilities ensures their access to ICTs and knowledge.

Thus, this paper presents specific examples of ICTs that aid children with hearing impairment. However, it is necessary to include also some related articles for

a more complete and accurate review of the topic. According to the results of the research, ICTs provide an attractive and supportive environment for students with hearing impairment as well as equal opportunities regarding their inclusion. Since we live in the world of information and digital revolution, we have to adapt to modern reality and prioritize the use of ICTs in education. The scope of this article is based on the concept of ICT, hearing impairment, sign language specifically Arabic Sign Language (ArSL) and inclusive setting. The researcher designed the soft ware called Human Sign Demonstration Arabic Recognition Manual Alphabet (H-S-DARMA) the controller itself is accessed and programmed through Application Programming Interfaces (APIs), with support from a variety of programming languages, ranging from C++, Python and JavaScript.

Concept of ICT and its Applications

Information and Communication Technologies (ICTs) concern the study, design, development, implementation, and support of computer information systems, especially computer software applications. ICTs use electronic devices and software for the conversation, storage, protection, processing, transmission, and to secure retrieval of information. Diso & Danlami (2018) Viewed information and communication technology (ICT) as a range of products and information using computers and or telecommunications technologies.

In relation to teaching and learning, ICTs make learning possible anywhere and at any time by allowing the students to have access to information and knowledge wherever and whenever they want. The use of ICTs in education is inevitable. Students spend many hours of their daily life using technology, so it is reasonable not to be attracted by environments where technology is not being used. The use of available technologies is considered as the main tool for the implementation of inclusion and participation.

Technology can be divided into three categories:

1. Assistive Technology
2. Accessibility Technology
3. Universal Design.

Hearing impairment

Abdullahi (2021) views hearing loss as “a barrier that hinders the hearing of a child by preventing him from acquiring a linguistics system to transmit and receive information, express thoughts, and feelings and to learn”. The child is said to be hearing impaired if the condition (hearing loss) affects his/her educational performance. For Wangara (2014), hearing loss is an impairment in hearing which refers to abnormality in either structure or function of the ear from its nature. Children with hearing impairment are those who belong to sub-cultural entity in the society and they possess

a rich visual and pictorial language which are considered as their first language (Dagbo, 2017). In connection to the above definitions, hearing impairment is an umbrella term which encompasses all impairment (functionally, degrees, types, classification etc) of the ear. Non – Arabs persons with hearing impairment implies those individual in which Arabic is not their native language or non-arab citizen, these individuals may include the Nigerians with hearing impairment.

Sign Language

Sign language is a generic term which encompasses any manual communication such as pointing, demonstration, blinking of eyes, smiling, frowning, nodding of head, traffic signals, sign board, etc. The term is not just a language of gestures it has its own morphology, syntax and semantics. Since there is no magic to the mastery of the language, it can then concluded that effective communication is dependent on proficiency in language. To Abdullahi (2021), Sign Language is the native language to “deaf” individuals. It is a visual-gestural language unlike spoken language which is mainly auditory and vocal. In the word of Odusanya (2006), sign language has three features which include; hand shapes, hand location and hand movement. He further explained that, hand shape is the manipulation of the hand to form a sign, hand location simply refers to the place and position where the hand is placed and finally hand movement is deals with the where and how the hand shapes moves. In addition, the term may be understood as living language “deaf” people use every day to argue, joke, declare love, or express sorrow.

American Sign Language (ASL)

The fact that American Sign Language (ASL) is the international standard recognized sign language does not mean that is a dominant language in the deaf community especially Arabic Countries. Odusanya (2006) stated that, the methods used in American Sign Language is different British, Arabic and other sign languages in several ways which includes word order, stress and phonemes. American Sign Language eliminates the use of such grammatical devices as articles, tends endings and some times, plurals except when needed for clarification.

Arabic Sign Language (ArSL)

In ArSLs, just like other sign languages, the context of the word depends on the shape of the hand, alongside its position and movement relative to the body. To aid in the meaning of the sign, facial expressions and facial movements are also used. Most signs in ArSLs are limited to nouns and verbs, but for prepositions and intensifiers, it is the execution of the sign which indicates the two. For example, in Libyan Sign Language, the sign "every day" involves touching the nose with the index finger and repeating it three times.

According to Abdullahi (2021), certain vocabulary in ArSLs are synosigns, antosigns, homosigns and compounds. Synosigns are two distinct signs with the same meaning. In ArSLs, these are uncommon. An example of a synosign is in Jordanian Sign Language, where the sign for 'girl' can be done in two different ways. Antosigns are two signs corresponding to opposite words; with both signs having opposite movements. An example of antosigns are the signs for "morning" and "night", where the sign for "night" is movement-wise the reverse of the sign for "morning. A homosign is a sign that can be used for multiple words and the interpretation of which depends on the topic of the conversation. Compounds are signs that use two or more existing signs to convey an idea. The words for which signs need to be compounded don't typically have corresponding signs. For example, the signs for "doctor" and "teeth" would need to be compounded to sign "dentist." Despite having many sign language varieties in the Middle East under the broader "Arabic Sign Language", it is unlikely that any of these languages are related to each other. Among the national sign languages which may be related are the following, listed alphabetically:

- a. Egyptian Sign Language.
- b. Emirati Sign Language.
- c. Iraqi Sign Language.
- d. Kuwaiti Sign Language.
- e. Levantine Arabic Sign Language.
- f. Libyan Sign Language.
- g. Omani Sign Language.
- h. Qatari Sign Language.
- i. Saudi Sign Language.
- j. Yemeni Sign Language

Inclusive Setting

The rationale behind inclusive setting is to allow and give easy access to a children with disability to attain a neighborhood schools, and to also create a mutual relationship between special needs individuals with their normal counterparts. In the idea of WasIU (2017), Inclusive education is a process whereby the learning capacity of the educational system in a country is improved by taking care of the educational needs services. This as an attempt to expose children with special needs, including those with hearing impairment, to the full school experience being enjoyed by their counterparts without any special needs. As UNESCO (1994) cited in WasIU (2017), a regular schools with inclusive orientation is the most effective means of combating discriminatory attitudes, creating welcoming communities, building an inclusive society and achieving education for all.

In the word of Isa (2019), inclusive education is a full placement of special needs in to a regular school or classroom. He added that, the main contention is to

avoid segregation and promote quality. This is to say that inclusive is a developmental approach seeking to address the learning needs of all children, youth and adults with specific focus on those who are vulnerable to marginalization and exclusive.

Benefits of inclusive education to individuals with hearing impairment

Students with hearing impairment can benefit from inclusive education in the following ways:

- I. Creating opportunities for making friends with hearing individuals.
- II. Vocabulary development for students with hearing impairment.
- III. Students get confidence in themselves and relate socially and educationally (Isa, 2019).
- IV. Create a competition between hearing impaired and their counterparts
- V. Psychological balance.
- VI. Development of speech and spoken languages.
- VII. Creating opportunities for them to display their potentialities etc.

Applications of ICTs on teaching of Arabic Sign Language to deaf

The applications of ICTs on teaching sign language are viewed as essential to various prominent scholars within the arena of Computer science and special education. For instant Yakubu (2014) opined that, technological advances in the form of digital hearing aids, assistive listening devices and cochlear implant provides even more opportunities for the development of listening and speech skills among the deaf and hard of hearing. He mentioned some devices used for teaching this concept which include; assistive listening devices such as hearing aids, telecommunication devices, alerting devices, cochlear implants etc. computerized speech-to-text translations.

To Diso and Danlami (2018), the ICTs for learners with hearing important consist of the amplification devices used by children and adults with hearing impairment. These hearing aids comprises of the following;

- i. Behind the ear aids (BTE)
- ii. In the Ear Aids (ITE)
- iii. In the canal aids (ITC)
- iv. Body aids
- v. Bone Vibrator Aids
- vi. Cochlear Implants
- vii. FM System

To computer scientist the applications of ICTs for teaching Arabic sign language to the persons with hearing impairment may refer to the soft wares development that will execute the task of Arabic sign language using programming languages such C++, Java etc. Any software tool that helps people practice reading finger gestures must be natural enough to represent the fluidity of that gesture, while at the same time being flexible enough to write any word in the target language in any order. To address these

needs, a new mobile app called “Finger Spelling Tutor” was presented. Toro (2019) cited in Abdullahi (2021), developed software for Finger Spelling Tutor application, which uses a 3D character that displays spelling. The application includes quizzes and tutorials that allow the user to type words that the 3D character can spell. At the same time, it connects to social media and creates a virtual community with people with hearing problems.

H-S-DARMA is a soft ware application designed by a researcher of this study. And as mentioned previously the software accessed and programmed through Application Programming Interfaces (APIs), with support from a variety of programming languages, ranging from C++, Python and JavaScript. The application contains 500 Arabic Sign language vocabularies with Arabic Manual Alphabet (ArMA).

Validity

The application after proper scrutiny presented and submitted to the Faculty of Computer Science and Information Communication Technology Bayero University, Kano. Department of computer science and Statistics Federal College of Agricultural Produce Technology (FCAPT) Kano also validated the study.

Reliability

In order to ascertain the reliability of the instrument, a pilot study was conducted at Kuka bulukiya Special Education School. A total number of 6 questionnaire items was administered to the students with hearing impairment, which were not part of the study at the interval of two weeks. The scores obtained were analyzed using Pearson Product Moment Correlation and the reliability index of 0.65 was arrived at.

Procedure

The researcher called the attention of video camera man and captured all the 500 Arabic Sign Language vocabularies together with Arabic Manual Alphabet (ArMA) and arranged them alphabetically on the soft ware. Those 500 Arabic Signs were draw by an Artist including the alphabets while the researcher was demonstrating them one by one. The soft ware is programmed in such a way that the users can select the Normal Arabic words require to demonstrate by the software.

The use of ICTs in Teaching ArSL to Non-Arabs Deaf

Followings are some of these Uses;

- i. Enhances language improvement of the deaf students through constant exposure to reading and retrieval of information system.
- ii. Improves grammar, spelling and overall sentence construction of deaf individual since more time is spent on the screen with language task.
- iii. Encourages individualized instruction, which permits exploration, experimentation and self-discovery.

- iv. Exposes deaf students to different texts of language variation used including Arabic in the child's immediate and far away environment, and provides exposure to learning processes, which cannot take place in the classroom situation alone. (Mustapha, 2009).

Problems Faced by persons with hearing impairment in an Inclusive Setting

Limited understanding of the impairment condition especially hearing impairment, negative attitude towards students with hearing impairment, corporal punishment may psychologically be perceived as haterate by hearing impaired individuals. Another area of challenge faced by students with hearing impaired in an inclusive setting is lack of teacher concern by the teacher as a result of poor communications skills. Problems faced by students with hearing impairment may be as a result of language/speech, socio-economic and psychological development in an inclusive setting (Yakubu, 2014).

Problems of Nigeria toward Inclusive Education and ICTs for ArSL to persons with hearing impairment

Implementation in any life endeavor is backbone for the successful journey in any project especially education specifically special education. Hitherto, inclusive education is difficult to implement especially in developing countries like Nigeria. It needs restructuring of the regular schools to allow for the participation of all children in terms of provision of teaching materials and equipment (Isa, 2019). In a study on school barriers to inclusive education in Nigeria Okeke (2003) cited in Isa (2019) recommended the followings:

- i. There should be agreement among the professional on the model or approach of inclusive education to adopt so that there will be uniformity of purpose
- ii. Inclusive education should only be adopted in Nigerian education system if it is among the current education reforms. Its adoption should be based on through research and preparations to ensure that all schools barriers are isolated and solutions preferred.
- iii. Regular classroom teacher should be at the heart of inclusive education. If this is accepted then it is recommended that in-service training should be arranged for them to equip them with inclusive education principles before its introduction into the system.

Lere and Anyamu (2009) mentioned that, barriers to ICTs and inclusive education may include:

- i. Inadequate funding.
- ii. Societal Attitude.
- iii. Lack of political will.
- iv. Inadequate manpower to manage inclusive practice.
- v. Lack of special needs friendly schools and structures.

- vi. Inadequate provision and consideration in the in the curriculum.

Conclusion

In regard to Inclusive setting, Non-Arabs with Arabs with Hearing Impairment can find ICTs as a suitable medium of learning Arabic Sign Language. ICTs enables deaf people to express themselves and help the surrounding hearing people understand the deaf individual's thinking process, feelings and needs (Mustapha, 2009). Inclusive education as conceived, advocated and practiced is a complete departure from the practice of special school system of education where placement in a class or school is occasioned by the strength or weakness, abilities or disabilities of learners (Egaga, 2009). **H-S-DARMA** is a software application developed by this research in order to enable Non-Arabs deaf learn Arabic Sign Language (ArSL)

Recommendations

Based on this research, it is recommended that:

1. Government right from local, State to Federal ministries, stake holders, Non Governmental organizations, educational associations, agencies, educational funding and supportive bodies etc should invite soft ware developers for creating more applications that will execute different ArSL for Non-Arabs Deaf.
2. Workshops, seminars, sensitizations, conferences etc. should occasionally be organized for teaching Arabic sign language to teachers of Non-Arabs deaf in Nigeria.
3. Arabic Sign Language should be included in primary and post primary schools as a core curriculum.

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