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AN ANDROID APPLICATION TO AID UNEDUCATED DEAF-DUMB PEOPLE

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Abstract

One of the most popular handicaps is the deaf and dumb type, which prevent person from listening and talking. The number of deaf and dumb in the world continuously increasing and they are introverted closed society. Therefore, Deaf-Dumb people do not have normal opportunities for learning. Uneducated Deaf-Dumb people face serious problem in communication with normal people in their society. It is notable, however, that most available application focus only on learning or recognition of sign language. In this paper, we introduce an integrated android application to blend uneducated Deaf-Dumb people within society, and help them to communicate with normal people. The introduced application proposes an easy translator in keyboard form that can translate any word from sign language to Arabic or English language and vice versa. This application also contains most daily words for teaching deaf and dumb kids in attractive way (colors, pictures, animations, quiz …etc). Moreover, it introduces some games that help them to communicate and entertain.

Keywords: Android Application, Deaf and Dumb, Sign Language

1. Introduction

Deaf and dumb is a term means a person who could not either hear or both hear and speak [1]. The number of deaf and dumb in the world continuously increasing and they are introverted closed society. The education of the deaf is only about one century old [2]. Since sign is the earliest way of communication in the world when there is no appropriate language, so the sign language is preferred among the deaf-dumb people for education.

As with other forms of manual communication, Sign language depends on finger spelling. The simplest visual form of finger spelling is simulating the shape of letters in the air, or tactually, tracing letters on the hand. Finger spelling can use one hand such as in American Sign Language, French Sign Language and Irish Sign Language, or can use two hands such as in British Sign Language [3].

Uneducated Deaf-Dumb people can communicate with other people (normal or handicaps) with sign language only, so they face serious problems in their daily life. For example: restaurants, transportation, hospitals, government offices...etc. Therefore, they need an effective tool to translate their words from sign language to Arabic or English language directly. This tool can facilities their communication with normal people and encourage them to learn both Arabic and languages. Also, Deaf-Dumb kids needs to learn sign, Arabic and English languages in an interesting way.

For the above reasons, the motivation of our application is to offer a service to the society in general and to Deaf-Dumb people in particular. This work is an integrated system that can easily solve most of their problems in one application. Therefore, the present work aims to:

- Help deaf and dumb to interact more with normal people
- Offer a great tool for parents to teach their deaf and dumb kids
- Introduce Sign language keyboard.
- Introduce quizzes and games for training deaf and dumb to identify Arabic and English words.

Hoping this application can give a hand to uneducated Deaf-Dumb people who could not read and write Arabic languages to communicate with others, to learn and to entertain.

The reminder of this paper is organized as follows. Section 2 discusses the related. Section 3 describes our proposed application in details. Section 4 provides the related performance evaluation. Finally, section 7 concludes this paper.

2. Related Work

There are few mobile applications for Deaf and dumb like Deaf and Dumb through 3G applications [4]. These techniques only enable communication between deaf and dumb through sign language using mobile phones. The mobile application which proposed in [5] helps to make recognition of sign language. Mobile-based Deaf and Dumb Interaction System project in [6] proposed mobile application that enables the needs of 'deaf and dumb developing a voice-activated mobile which would convert their sign language into messages that may be read by other users, this message can also converted to a voice.

3. The Proposed Application

One important issue in any application is to know the importance of this work in the society. Therefore, we designed the questionnaire in Arabic language "Figure 1,". This questionnaire was uploaded on estebyan website [7]. Also this questionnaire was distributed between 50 deaf and dumb persons in Saudi Arabia with help of expert in sign language to explain every question to them.

The present application was implemented on android operating system which an operating system for mobile devices such as smart phones and tablet computers. The advantage of this operating system is providing access to a wide range of useful libraries and tools that can be used to build rich applications [8].

This application is conducted using the following software:

i. Eclipse

Eclipse is an integrated development environment (IDE) comprising a base workspace and an extensible plug-in system for customizing the environment. It is written mostly in Java. It can be used to develop applications in Java. Eclipse is used it to provide the application with the required environment for programming by installing the required platforms.

ii. SQL Lite

It is the most widely deployed database engine, as it is used today by several widespread browsers, operating systems, and embedded systems, among others. SQLite program used to add and create databases.

iii. Java

Java language is used to program the application. Java is a computer programming language that was developed by James Gosling at Sun Microsystems and released in 1995 [9]. We used Java because it is platform-independent and flexible in nature. The most significant feature of Java is to run a program easily from one computer system to another.

Figure 1: The questionnaire

4. Performance Evaluation

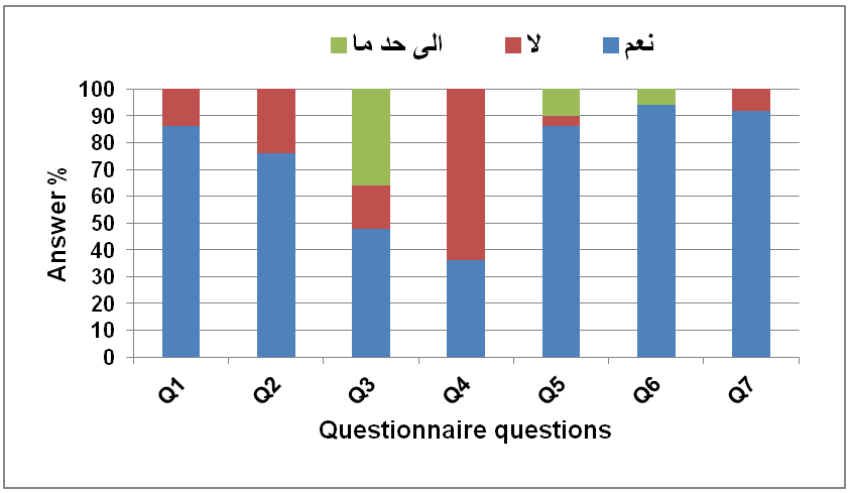

Figure 2: The percentage of people response for questionnaire questions.

Q1 هل تجد صعوبة في التواصل مع أفراد صم وبكم من مناطق أخرى؟
Q2 هل تجد صعوبة في التواصل مع أفراد لا يجيدون لغة الاشارة؟
Q3 هل تهمك تطبيقات الجوال؟
Q4 هل تجذبك برامج معينة أو تطبيقات معينة في الجوال ؟
Q5 هل تعتقد أن عدم وجود تطبيقات خاصه بالصم والبكم على الجوالات عامل نفور من استخدام لجوال؟
Q6 هل تعتقد أن حقوق الصم والبكم في البرامج التلفزيونية والترفيهية وتطبيقات الجوال قليلة؟
Q7 لو تم تصميم تطبيق جوال يهدف الى مساعدتك في التواصل مع الآخرين هل ستبادر باستخدامه؟

To show the importance of the present application in the society, the questionnaire was analyzed. The results showed that more than 90% of Deaf-Dumb people will use this application in communication "Figure 2,".
"Figure 3," represents the home screen of the present application. This home screen allows users to enter the different areas of that application:
Main words – Sign language keyboard – Alphabet – Dictionary – Quiz – Games.

Figure 3: Home screen

Figure 4: Main words

The main words contain most general words that deaf and dumb may use during daily communications. Like Animals, Colors, Numbers and shapes. When user chooses a category from the list, the words under it will be displayed as shown in "Figure 4,".
Sign language keyboard translate any word from sign language to Arabic or English and vice versa as shown in "Figure 5,". The first button means translation from Sign language to English. The second buttons means translation from sign language to Arabic language. The third means translation from English language to sign language. The last one means translation from sign language to English.

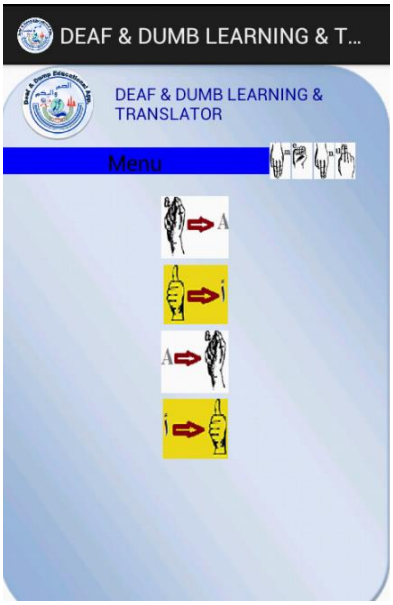

Figure 5: Sign language keyboard options

This tool allows uneducated Deaf-Dumb people to write any word to normal people in any place in sign language and it will be translated directly to English or Arabic languages according to their choice as shown in "Figure 6,".

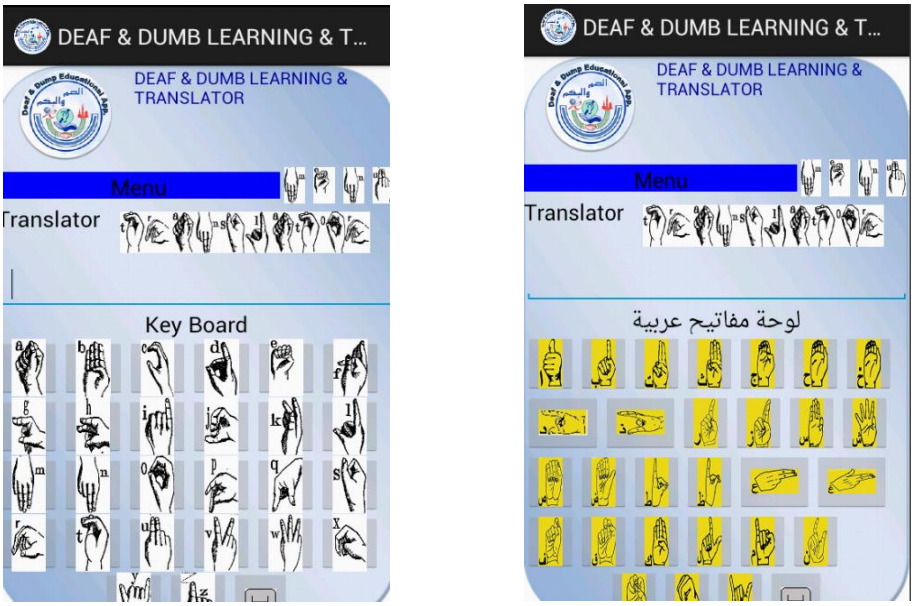

Figure 6: Translation from sign language to English or Arabic languages.

"Figure 7," shows how normal people can write any word to Deaf-Dumb people by their language (English or Arabic) and it can be translated through the keyboard to sign language.

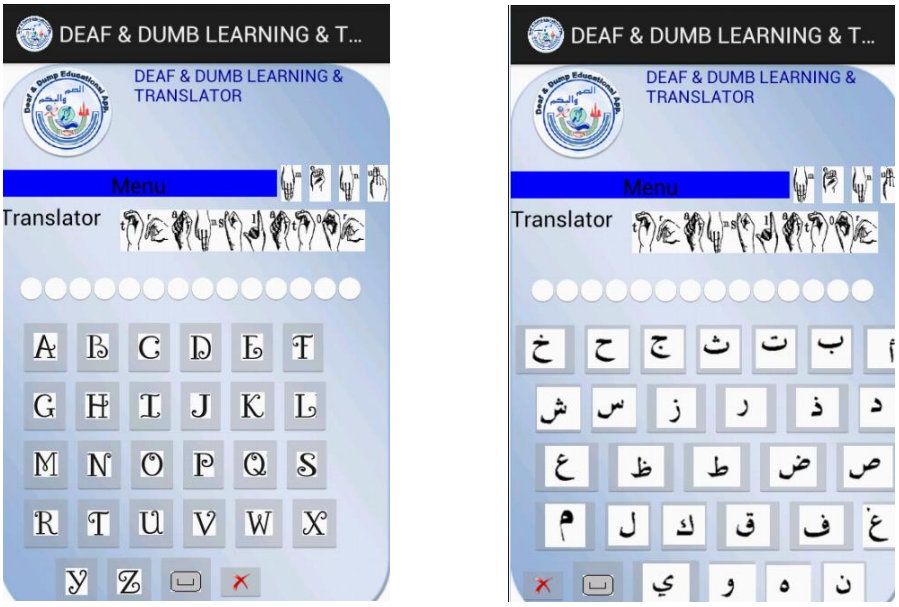

Figure 7: Translation from English or Arabic languages to sign language

Alphabet button shows the sign language alphabets to help kids to learn it as shown in "Figure 8,". The quizzes button in "Figure 9," displays a question in sign language and let the children choose the correct answer from English answers. This helps Deaf-Dumb kids to practice English and sign languages. This option does not only help Deaf-Dumb but also help normal people to be familiar with sign language.
Some games were added to the present application as shown in "Figure 10," These games make the application more attractive for kids to learn and entertain. Also, this allows users to find all their requirements in the one application.

Figure 8: Translation from English or Arabic languages to sign language

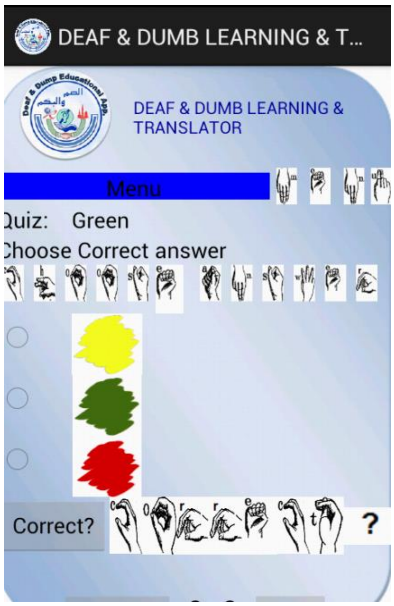

Figure 9: Example of quizzes

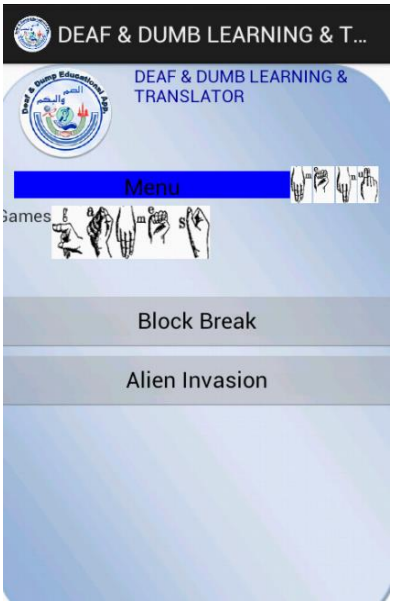

Figure 10: Deaf-Dumb games

4. Conclusion

In this paper, we present an efficient application for uneducated Deaf-Dumb application. This application aims to help deaf and dumb by providing them with an attractive communication and learning tool. This work introduce a Mobile application that enable communication between uneducated Deaf-Dumb and normal people in our society .It also develop an aid tool for deaf and dumb in many fields like restaurants, Hospitals and transportation. Moreover, this application introduces an easy translator from sign language to English or Arabic language and vice versa.

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A Brief Author Biography

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