

# Alternative Central Mobile Application Strategy to Deaf and Dumb Education in Third World Countries

Majzoob Kamal Aldein Omer, Mohamed Sirelkhtem Adrees, Osama E. Sheta

**Abstract** — *The study aims to apply the strategy to help deaf students and dumb in academic achievement by using mobile learning technology application , This sample of the students have a high potential for the use of mobile applications and has a capacity of great learning via mobile. Smart mobile phones have the ability to create a good educational content of images, shapes, graphics and illustrations appropriate signs to the Deaf and Dumb students and the production of educational content suitable for individual differences in education between them and meets their needs mental and their interests that are different from ordinary students in Education. The paper focuses on the educational content of the component images, graphs, and illustrations appropriate signs to the Deaf and Dumb students because it is not easy to understand by a normal listener on the opposite and to make things worse. In fact the technology is used to achieve the interaction between deaf and dumb children with others.*

**Index Terms:** Educational Content, Deaf and Dumb Student, Scalability, Integration, home user, institute user, provider user.

## I. INTRODUCTION

First there will be almost 3 billion Internet users, two-thirds of them coming from the developing world, and that the number of mobile-broadband subscriptions will reach 2.3 billion globally. Fifty-five per cent of these subscriptions are expected to be in the developing world [7] fig 1. Second at the Pre-School Children's Home, children are taught to speak from the age of two years. Synthetic reading of words, phrases, names, commands from the lips and reflexive, unconscious imitation of verbal speech are the two fundamental methods. The habit of expressing wishes and thoughts verbally is being developed here from early childhood. Speech is taught straight away in a most practical and social manner. When the child is playing and working daily, it learns unconsciously to speak and understand the spoken word; it also learns to concentrate on speech, organize its life and the conduct of it; these achievements would be inaccessible to a dumb child. At the early stage, from two to five years, there are no sounds to be dealt with. The exercises consist of children's first prattling which are preparatory to each new word and reading from the lips; simultaneously with it, the organs of speech - voice, breathing - are also working and developing in quite a natural way.

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These exercises are being practiced before the child actually acquires correct speech. Deaf and dumb often communicate via sign language, a kind of representation of words through hand and finger positions. But it has got serious limitations because it is not easy to understand by a normal listener on the opposite and to make things worse, not many in the world know sign language at all [1] . Ninety percent of deaf children are born to hearing parents who have little prior experience with Sign Language [2].The number of Deaf and Dumb in third world countries continuously increasing and they are introverted closed society. The education of the deaf is only about one century old [3]. 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 [4].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 office ...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 and Dumb kids needs to learn sign, Arabic and English languages in an interesting way.

## II. A REVIEW OF LITERATURE

1- N.Hema, Ms. P. Thamarai, Dr. T.V.U. KiranKumar (2013) [1], in this paper, shows how technology is used to achieve the interaction between deaf and dumb people with others. This technology used for data acquisition and transmission. Choose low hardware equipment and transport protocol, add the node sleep mechanism, so that the system has low energy consumption, large communication range, high stability characteristics. Used as the mobile phone for Deaf and Dumb. Short distance as well as long distance communication is possible. Touch screen gesture method eliminates the use of complex hand gestures. Hence removes the need for hand movement sensing systems which are quite large, complex, expensive and slower. Support for uneducated people with Image translation feature.

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Language learning mode helps uneducated people to learn English words through it. More advanced user can use word translation.

2- Dalia Nashat, Abeer Shoker, Fowzyah Al-Swatand Reem Al-Ebailan, (2014) [5], 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.

3- Kimberly A. Weaver, Kimberly A. (2012) [6]. In this paper we have explored what it means to create a mobile informal learning tool for hearing parents of deaf children attempting to learn sign language. We described the application and outlined a study which will investigate how using this application will impact parents' ability to learn vocabulary. The final contribution of this paper is a reflection on the how device platform decisions may impact the developmental cycle and the evaluation of mobile applications. In the case of SMART Sign we strive first for experimental validity and will then expand development to provide wider access to the target population.

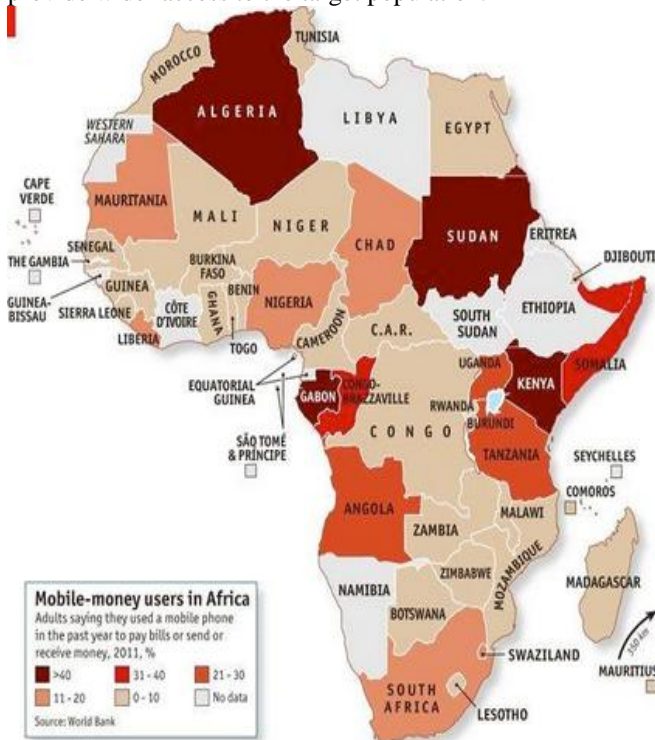


Fig 2 : mobile money users in third world countries

## III. DEAF AND DUMB MOBILE LEARNING STRATEGY

This section is divided into two subsections. In the first subsection survey of the strategies used in mobile applications for the implementation of the program. The second sub-section discusses the issues with regard to implementation of the program and mechanisms adapted to benefit Deaf and Dumb students in childhood in Third World countries.

### A. Optimal solutions for mobile education strategies:

Construction of a mobile strategy for the institution education of the deaf and dumb starts from the recognition of the needs, and the necessity of having these programs, to increase academic achievement for them, and observance of individual differences among them and the different cultures, and desires in education, in addition to that, it's just as crucial to the understanding of the institution's ability to allocate resources to create powerful mobile environment. Comparison against peers .Mobile applications typically involve at least two components: the application code itself (which may be programming code ,php, CSS, under WAP or Android platforms Ajax or any combination of these and other elements) and the data that the application displays . While issues arise in association with the planning and design of the programming component, in many cases the implementation of the data component may be as or more challenging. Mobile applications present a set of data challenges and issues that may be less prominent or acute for traditional "fixed place" applications. There is a challenge of making data owners comfortable with the idea that their data will become much more readily, immediately, and widely available. We will explore different directions that a deaf and dumb education institution may take when developing a mobile strategy. Identifying a technology strategy is always a challenge because it requires trade-offs between resources, timelines, and control. Establishing an institution's mobility priorities along with an understanding of its IT capabilities allows for the development of an optimal mobility strategic plan. When both needs and available IT resources have been assessed, they may be mapped against one another to model the trade-offs and determine which strategic options are available and well suited for the institution. The following sections describe scenarios that lend themselves toward each of the three strategies: mobile application framework, Data Scalability, and Data Integration.

#### First: Mobile Application Framework:

We provide Responsive Web Design (RWD) an optimal viewing experience, easy reading and navigation with a minimum of resizing, panning, and scrolling across a wide range of devices from mobile phones to desktop. Media queries allow the page to use different CSS style rules based on the device. Using grid system of CSS media query the website will be turn into a Mobile Web App and we can access the website by using any mobile iPhone, Android, Windows and also Mac, iPod, desktop PC.

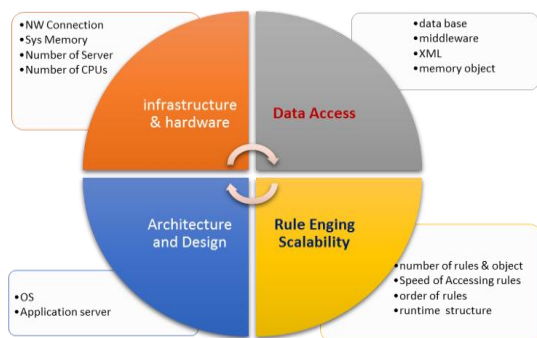
We use complete solution for creating hybrid mobile apps with all you need in one place such as Titanium (table: 1). The Titanium SDK is equipped with a number of mobile platform APIs and Cloud service to use as an app backend. It comes with platform-independent APIs which makes it easier to access phone hardware. Titanium uses Alloy, a MVC framework to enable rapid development of mobile apps. Modules created using Alloy are easy to reuse across different apps, hence significantly reducing the development time and the lines of code.

**Table 1: advantage of hybrid platform**

Feature	Hybrid	Native	HTML /Web
Cross- Platform /Code Reusability	Yes	No	Yes
Development & maintenance Cost	Low	High	Low
UI	Medium	High	Low
App store distribution	Yes	Yes	No
Offline access	Yes	Yes	No
API Access	Partial to high	Complete	Low
Performance	High	High	Low

**Second: Data Scalability:**

Devices and smartphones run applications just like your laptop or home computer. However, these applications have some special requirements such as location-based search. They also are typically not as weight as their desktop counterparts, as memory and computing cycles are limited on a mobile device. What's more they should have a reduced network requirement and make fewer round trips between the device and the server , load balancing the webserver tier , load balancing the database tier (fig:2), It also introduces fast location based search and lookups and minimal network usage . In this manner we optimizing a mobile application, pay particular attention to the measured amount of data that moves back and forth on each page. Optimize images of Deaf and Dumb sign education and/or remove or update them if possible. Adjust layout for the most popular devices, and spend extra time testing. This creative solution may fit business requirements and we will bring huge speedups to the database tier, and thus your overall Deaf and Dumb mobile education.

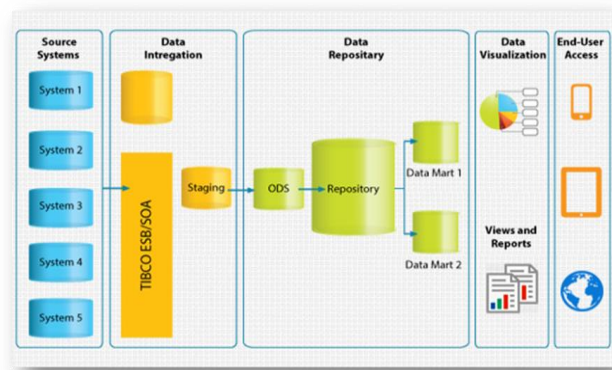


**Fig. 2 : Mobile Application Scalability**

**Third: Mobile Data Integration:**

Mobile application integration enables developers to deliver an enhanced mobile experience by providing real time access to back end systems and multiple information sources (e.g., websites, web portals, databases). Mobile integration solutions from deliver a no-coding approach to application integration, enabling developers to deliver on business requirements in a fraction of the time it would take other mobile development tools. It is designed to facilitate integration between applications and systems that are not typically mobile friendly. We can keep up with the volume, variety and velocity of data required to power mobile learning applications.

We use mobile integration data to get mobile access to any web data source and reduce complexity and costs on mobile development (fig 3).



**Fig. 3: Data Integration**

**Mobile learning Application:**

Text to Sign Language Converter” is a Mobile learning application to Deaf and Dumb for conversion of text to sign language for effective communication with deaf and dumb people. It is also a region independent language creator tool where new words and respective images could be added into the library by using web cam and mobile camera. The application takes text as an input and generates the output dynamically by searching many different images for every word and displays output by playing them with particular time gap System searches the occurrences of input words.

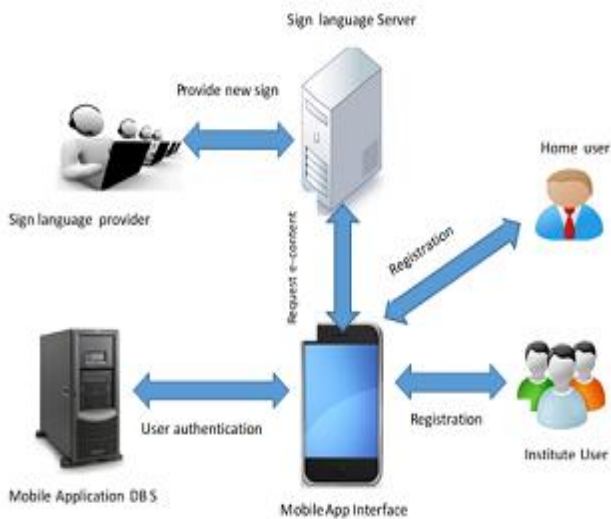
Stage one is explained which, describes the flows of operations between the users and the mobile application. This stage contains two steps, namely, the registration and sign language generation. Those two steps are explained as follows.

The registration step: The user can be an institute or an individual user (home user). In such of the two cases, the customer must register with the mobile application database. The registration process can be institute registration or home registration. In the following, we briefly discuss each of the two scenario.

In institute registration: The user goes to the institute to provide his personal information, registration process to user can be done by theirs institute. After that, the user name and password of the user creates in database and provides it by initial credentials. These credentials will used for later procedures between the user and mobile application for evaluation.

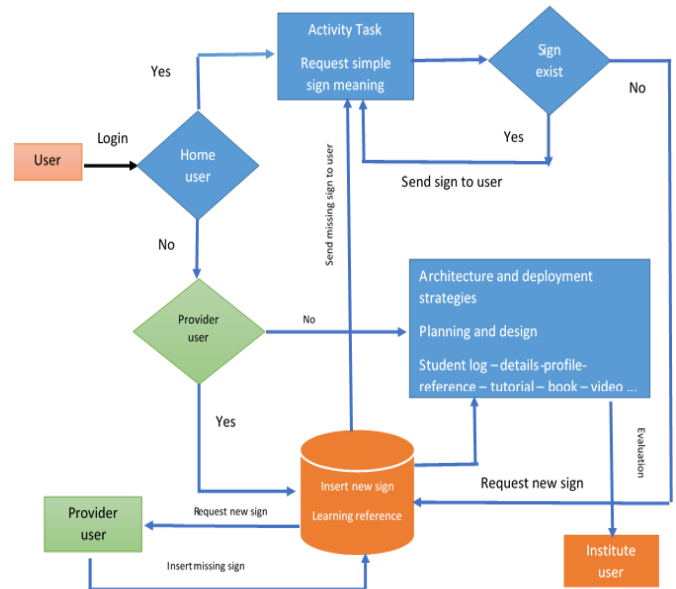
Home registration: the user and mobile application information are sending through private channel to the registration server. And the authentication of customer personalities are made by himself. As before, the database entry will created for user information and initial credentials will be sending back to the user or his parent. Fig3.

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**Fig.3: Mobile Learning Application Model**

The user makes modifications of the mobile database at first after access the application interface. Synchronization occurs between the server and the mobile application to ensure the data are the same. In order to complete the synchronization, a publication is needed. A publication is the meta-data package of information about which data is replicated. The database server can synchronize with the mobile database correctly. The publication can only be accessed by the different type of users after they are authenticated. A home Users can access the application interface in order to retrieve the meanings of simple words or sentences composed of a maximum of three words via sign language. The application recognizes the type of user (Home User, Institute User, and Provider User) by registration data that is entered into the Mobile Application interface form (username and password). If there is no meaning of simple words or sentences introduced by the home user retrieval, the system sends an alert message to the system administrator (Provider User) to insert the new meaning of the word desired by the home user. In this manner the new sign language video and animation generated in the database by Provider User. (See Fig: 4). The Institute User can access the application via data recorded in the system by the Institute. There are various activities performed by the user, such as individual activities like inquire about the meanings of words, sentence made up of more than two words, games, tutorials. There are group activities such as chatting and discussions forums between the groups. Student educational content based on their levels and that is simple and understandable for students.



**Fig.5: Main Model Diagram**

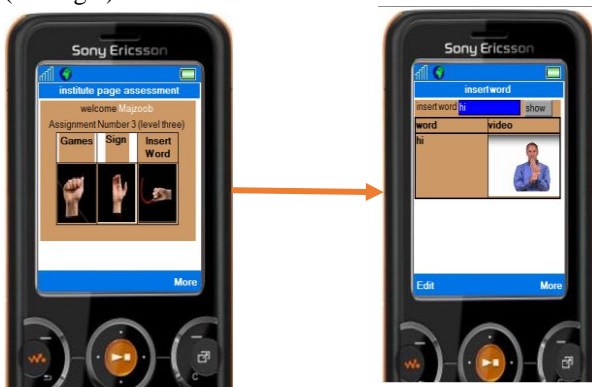
Mobile applications allow the user to control the information flow and communication through the mobile device; namely, these devices are usually personalized or individualized. Second, mobile connectivity improves collaboration via real-time or instant interactivity, regardless of time and location, leading to better decision making. Finally, mobile connectivity enhances customer orientation as users have better access to their service providers and do a better job in balancing their Work life through a productive use of time. These benefits can prove equally useful for improving the learning. Therefore, mobile phones are considered the best evaluation tools for deaf and dumb students.

The evaluation process was broken into two phases. The first phase of the evaluation to Home Student and second phase to Institute Student. In first phase there are simple application like games to interact between the home student and application, simply the user know about how to determine the simple sign meaning and how to compose simple sentences. There are some feedback incentive for students, Such as virtual incentives or some cumulative gift after completion the evaluation successfully. This assessment was created by education specialists in the field of teaching sign language for the deaf and dumb, paves the student transition to the advanced phase of M-educational system. (See fig.5)



**Fig.5: Home WAP Interface of Application**

In second phase there are several method to evaluate the student's cause that that learning must be assessed through performance such as what students can do with their learning. Assessing students' performance can involve assessments that are formal or informal, high- or low-stakes, anonymous or public, individual or collective. We provide suggestions and strategies for assessing student learning and performance as well as ways to clarify your expectations and performance criteria to students by using fun side of assignment design. Consider how to focus students' thinking in ways that are creative, challenging, and motivating. Think beyond the conventional assignment type and must create examination that meet the individual difference in learning between students and the ability of students to assimilation. . (See fig.6)



**Fig.6: Sample to Display the sign meaning**

#### IV. CONCLUSION

In this paper, we proposed an enhancement model to increase the efficiency of the Mobile Application strategy for Deaf and Dumb sign language in third world countries, and to increase the efficiency of the operations in the Mobile Learning, our results from this model to create interactive and dynamic content and how to build Mobile Application that is ability to track the performance of Deaf and Dumb student and easy to use by the students ,also we proposed new strategy to develop Mobile Learning Application by using data scalability, data integration and mobile frame work , and how to develop deaf and dumb e-content on any

type of Mobile Device. Moreover, the proposed model describes the require procedures to provide conversion of text to sign language for effective communication with deaf and dumb people. It is also a region independent language creator tool where new words and respective images could be added into the library by using web cam and mobile camera. The application takes text as an input and generates the output dynamically by searching many different images for every word and displays output by playing them with particular time and how to assess the students (Home user and Institute User). Finally, the using of proposed model does not just support mobile service; furthermore, it can be integrated with others mobile learning services like integrity services.

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