

**INVITED ARTICLE****Teaching and Evaluating The Performance in Vernacular  
(Gujarati) Sign Language for The Deaf & Dumb Community****Burade N.S. and Patel A.G.**

**Abstract:** Learning the names of the surrounding objects like table, ball, cat etc. by the deaf and dumb children of age group of 3 to 10 years is a difficult task as compared to the normal children. These children have disability in hearing and therefore they cannot speak. Making them understand about the things around them under such condition becomes a challenge for the family who owe such child. A blind child, though, equally challenged, has only one disability. But the Deaf and the dumb child have the two, which puts the society at large in a challenging state to give them a status to live like a normal child. To really understand their feelings, one has to be like them for a moment. Educating the Deaf and Dumb (D&D) child is again more challenging because the normal method of teaching no longer works. Present work intends to implement Information Technology (IT) to build and support the teaching and learning process by incorporating graphics, animations and videos. An evaluation method helps to ascertain the level of understanding by a child.

**1. INTRODUCTION**

It is felt important to think about the children of the corner of the society which has two disabilities i.e. Deaf and Dumb. Though, they are intelligent, Educating them and making them at par with the normal children is challenging. Educating them in their vernacular language (Gujarati) becomes more challenging to the children particularly of the age group 3 to 10 years. Sparkling eyes, when staring at the different living objects around them to get perception of it, at the time of communicating with the people around them, make one emotional. Though the number of such children may be less but educating and nurturing them like a normal child require concentrated efforts by the Government and the society at large to avoid being ignored or laughed at by the people around them.

Parents and the people who interact with them use crude method of communication involving the movement of hands, body and the lips. This method of communication varies from people to people making the D&D child in a state of confusion. It is observed that no scientific technique is designed and developed to make such children understand the alphabets, words and the sentence construction (grammar) in their vernacular language easily. This is the reason why such children do not attain an equal level, as of the normal child in terms of age and knowledge.

Due to the advent of the Information Technology, it can be utilized to design a scientific method for communication. Hence, the present work intends to develop a method of teaching the D&D children of age group 3 to 10 in their mother tongue language called Gujarati with the use of IT tools.

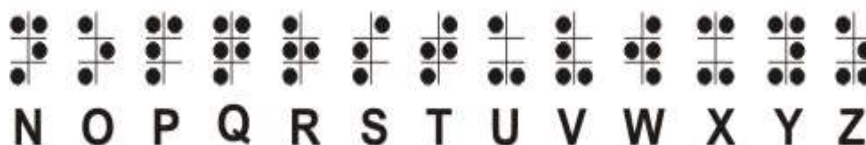
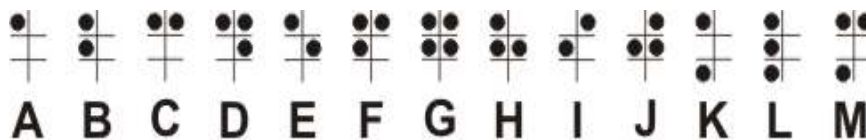
## 2. PRESENT SCENARIO

Be it any language, vernacular or English, its learning process starts from the understanding of its alphabets followed by words and construction of sentence using grammar. Alphabets are the basic ingredients of any language. Following text gives the idea of signs used by the disabled.

## 3. SIGNS USED BY THE BLIND

As shown in the figure below, blind uses the following six dot pattern to identify the alphabets. "Braille" is a method of reading by touch that is used by many blind and partially sighted people around the world. Braille is a system of raised dots which can be read by touching the fingers to the dot pattern while moving on the line. Because, it is phonetic in nature and this system of dot pattern is accepted by all the nations of the world, teaching and learning by the blinds do not have much difficulty as compared to deaf and dumb. Very sophisticated IT equipments and software tools are now available to make teaching and learning easy and fast.

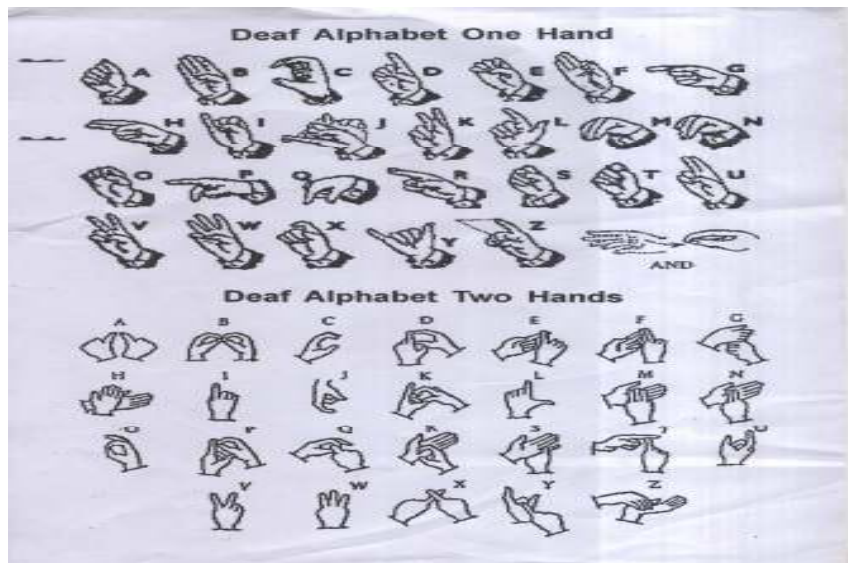
It is important to note that touching the raised pattern of dot or any object by the blind replaces the disability to a greater extent. The perception of color is the only part which is difficult for them to understand.



## 4. ENGLISH SIGNS USED BY THE DEAF AND DUMB

Due to two disabilities, Deafness and Dumbness, perceiving the things around them clearly in the mind of D&D is matter of the method employed to teach them. To understand the English alphabets, D&D uses the movement of hands

and fingers as given in the following pictures. Combinations of movements of lips, fingers and hands are the only method being used for the communication. A set pattern of hands and fingers are used to understand the English alphabets as shown in the picture below.



To understand the alphabets with the movements of hands and fingers, following difficulties arises.

1. It becomes difficult for a child of age group 3 to 10 years to understand and remember the hands and the fingers movement.
2. Child of the above group is not clear and cannot digest the concept about the purpose and the use of alphabets merely through the use of fingers unless it is supported by the pictures, e.g. A for Apple, B for Baby etc. One has to use appropriate pictures to give the complete idea of the meaning of the alphabets.
3. Construction of words, sentences by incorporating the correct use of grammar is again a great difficult part. This is the reason why this children remained lagged behind the child of same age having no disability.
4. Also, explaining the formation of words using the above combination of the movement of hands and fingers is also time consuming. This is the reason that no standard practice is available and followed by the child to establish a communication between the two.

However, 'The comprehensive SIGNED ENGLISH DICTIONARY' edited by Harry Bornestein, Karen L. Saulnier, Lillian B. Hamilton and Illustrated by Ralph R. Miller. Sr. and published by the Gallaudet University Press, Washington D. C have work exhaustively in making the dictionary to illustrate more than 3000 signs in signed English system. But no such standard dictionary exists for any of Indian local languages.

### 5. DIFFICULTY IN LEARNING GUJARATI LANGUAGE

It is assumed that sufficient amount of work is done to teach and learn the English language for the D&D. It is worth mentioning that no concrete method is available to teach the vernacular language, particularly the Gujarati.

Majority of the D&D community in Gujarat prefer to have their study in Gujarati. Govt. of Gujarat has established a special cell called Samaj Suraksha at Gandhinagar to run schools and provide grants. There are nearly 44 D&D schools in Gujarat which are run either by the Govt. of Gujarat or by the private trust.

One of such school is located at Athwa Lines, Surat. About 200 D&D students of various age groups take education. The school is residential. The medium of instruction is Gujarati.

Our study reveals that unlike English language, there is no fixed signs to understand the alphabets due to complexity in the curves of each alphabets. Therefore, the teacher uses gesticulations to demonstrate the alphabets.

Following picture is a set of alphabets used in the Gujarati language. This may give us an idea of how complex it would be to position either hand or fingers to develop a character as compared to English language.



We can see that English alphabets having geometrical shapes can be easily demonstrated using fingers where as Gujarati alphabets are having curves which makes it difficult to demonstrate using fingers. Due to the advent of IT, the combination of pictures, animation and videos can be linked together to learn the alphabets of any vernacular language.

## 6. PROPOSED USE OF IT

Complexity in the Teaching of alphabets to D&D in Gujarati can be reduced to a greater extent by the use of IT. An attempt is made in the present work to employ IT to teach and learn the Gujarati Language by the D&D easily and without human intervention.

## 7. HOW TO TEACH ALPHABETS & BARAKSHARI



With each alphabet, we should have 4 pictures starting with that alphabets. The video shows how to write it. This will lead to a test after learning, to compare alphabets with picture of the objects shown. This exercise would help student to learn and remember alphabets. The learning of Barakshari will have a same pattern of learning and testing as Alphabets. Above picture gives an idea of this method of teaching.

## 8. HOW TO TEACH WORDS

The objects like, fruits, daily meal items, day to day use items, games items, study items etc will be shown graphically along with words for it and how to write it using animations. Once the students have sufficient understanding & ability to identify objects, test can be taken by them to check their skill levels.

Once students are familiar with objects, they can be taught processes like swimming, running, eating, drinking, sleeping, studying, playing etc.

### **9. HOW TO TEACH NUMBERS AND SIMPLE MATH**

It should be easier to teach numbers than alphabets. Since basic numbers are from 0 to 9, we can easily demonstrate it using graphics and animations. Once, students are familiar with basic numbers, 2 or more digit numbers can be taught easily. This leads to a self test, for checking numerical skills. Upon successful, understanding and identifications of numbers, they can be taught basic mathematical operations like addition, subtraction, multiplication and division.

### **10. SPECIAL CHARACTERS AND SIMPLE SENTENCES**

These 2 things can be taught together using sentences containing special characters. The sentence construction and understanding of sentence is possible only if student is having enough vocabulary and basic grammar. This can be tedious and time consuming process. We believe that this can be learn by more of a practice and watching related videos. We can start with simple sentences and gradually go with more complex sentences the way English repidex is designed.



### **11. CONCLUSION**

We may not be able to solve deaf and dumb's learning problem completely but intending to minimize difficulty in their learning process. The software tools can be further enhanced based upon the feedback from the students and their performance.

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