



## Interactive Triangular Global Model (ITGM) to Bridge Knowledge of Parents Towards Their Special Needs Children to Mitigate Communication Gap

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### ABSTRACTS

This study discusses challenges faced by individuals, particularly the hard of hearing, in accessing education and employment due to societal stigmas and lack of support. Technology plays a crucial role in improving their quality of life. Parental knowledge and support are deemed vital, yet lacking, particularly in sign language understanding. The study uses a systematic literature review and proposes the ITGM model to address these issues. It highlights gaps in global sign language standards and grammar, suggesting training for parents and collaboration among educational institutions, NGOs, and policymakers. The aim is to enhance opportunities for the hard of hearing by fostering awareness and support, ultimately advocating for a global model in sign language development supported by adequate funding.

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## 1. INTRODUCTION

Brain controls all human activities through senses. These senses give them awareness and increase their learning and working abilities. These senses also alarm them before something happens. When any message or signal is received in any pattern it is transferred to and verified by brain, if there is no response from brain side it means there is an interrupt called disability. Special people are those who have visionary problem, hearing problem, physical disability, or mental disorder (Olusanya *et al.*, 2014; Qaiser Sultana, 1993; Aqila Khatoon, 2003; Zahida S. Lari, 2002).

Different terminologies are used for 'disability' like impairment, handicap etc. In general disabilities supposed to be a curb in ability to execute a normal activity of daily routine. A disability may be physical or mental and the term referred as physical, developmental, behavioral, and sensory disabilities. The people with disabilities are not able to perform their activities properly like a normal people of society. Therefore, they depend on others for their necessities. No doubt, that disabled people can play vital role in society, but they need our support to overcome limitation of their disabilities. A collective effort should be made by responsible regime persons, academicians, and parents to design policy to make them functional citizen and resolve problems faced by disabled people (Schur, L. *et al.*, Barr, J. J., & Bracchitta, K. 2015).

Now-a-days the term Special Needs People (SNP) is used instead of disabled people to give them respect. In fact, there are various types of special needs people

as mentioned in above hearing disability. These types are further classified into two partially and totally disabled. Sometime disability is by birth and some time it occurs due to accident. Sensory disability includes deaf or limited hearing, blind or visually disabled. This research work focus on deaf people.

People with hearing difficulties or deaf face multiple challenges in society. Griggs in 1998 found that few of the hearing-impaired people also face emotional instability which is often undetected (Marzuki *et al.*, 2018; Al-Khateeb *et al.*, 2020; Griggs M. 1998). In 2007 Turner identified issue of gloominess and increased risk of suicidal tendencies among deaf adults. Sometime the negative attitude of their parents or close relatives hurt them this act trigger them to attempt suicidal act (Turner, O. *et al.*, 2007). Beside awareness of deaf or hearing disabled people there is a strong need to make society to accept them. To resolve this, issue their parents, teachers and regime people can play very important role. In Pakistan blind people acquire higher education in subjects like religion, history, social work etc. but the deaf or hearing disable people have no platform for higher education.

As a result, they mostly get clerk job, labor work, or remain burden on parents or society. The main barrier in deaf or hearing disabled people is communication (Munoz-Baell *et al.*, 2000; Miranda *et al.*, 2014). When deaf or hearing disabled people communicate with in their own culture i.e., deaf-to-deaf communication, they use sign language in second case if they communicate with normal community i.e., deaf-to-normal

they feel difficulties and similarly when normal people talk with deaf community, they face same problems (Ali, S. A. 2013). Normal people can be parents, siblings, relatives, teacher, and boss of deaf people. Except their teachers this is quite difficult for other people to understand deaf people language called sign language there are different sign languages use globally but the common sign language which are used most of the countries are British and American sign languages. (see figure-1 and figure-2). This is a big challenge for them that normal feel uncomfortable to talk with them and similar experience they face. Their parents can't help us in their education matter as the parents of normal children can do, due to this ignorance they isolated themselves from society. The role of higher education is ineffective in this regard; therefore, the door of higher education is almost closed for deaf or hearing disabled people in Pakistan.

### 1.1. Relation of Special Need Person with Other Society People

Exceptional Children are the part of global society. Addressing their needs and facilitating them, particularly in bridging their social needs are crucial for their sustainability. Challenges and opportunities face by exceptional children are multiple, however, it is important to see, how society perceive them. Parents are closer to Exceptional Children. They are the primary care giver. They have capacity for actions and range of actions and potentials. Their involvement is critical for the wellbeing of special children (Winter, J. 2006).

Challenges such as finance, future, administrative challenges, their welfare, etc. affect parental values and they fail to cope up with this challenge, which result

in isolation, etc. Most of the time, parents of children with special needs are more likely to face depression and other health conditions. Many underlying reasons accelerate this notion including lack of knowledge of parents towards adult deaf and their needs (Lindsay, G. 2013).

Regarding the sign language, there are variations in it which also create many challenges for parents to facilitate them. The issue of complexity of language and evolution of new ones reflect socio-cultural barriers. It certainly brings the attention of researchers to find the knowledge of parents towards special education. Parents who lack knowledge about deafness are less supportive and face severe emotional challenges with disparity. In this regard, education and economic status of parents play important role to facilitate these children (Eyalati *et al.*, 2016).

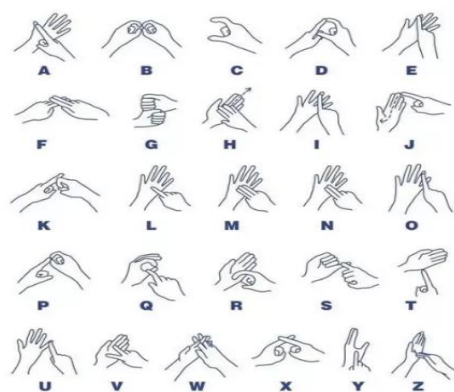


Fig. 1. British sign language (BSL)  
(Rambhau, 2017)

In Pakistan, it is often perceived that these individuals have limited capabilities (Batool et al., 2008) due to lack of awareness. Higher education institutions are playing pivotal role in preparing future generation, it is also their responsibility to cater to the needs of deaf person. Since deaf children are often socially and educationally inactive at higher educational level due to unavailability of institutions to cater their needs, their immediate caretaker, i.e., parents should be taken into consideration for advancing their knowledge. Adjusting deaf children in society (Young et al., 2008) is a need of the time as no attention has been paid by the higher education institutions to investigate the area of adult special children and no intervention such as training has ever been arranged for the parents of adult special children, to gain knowledge, support and facilitate these children with greater respect and care (Sorensen, D. A. 2019; Antia et al., 2015). The first step will be to find parents to take towards special children and later in the ground of findings, training will be organized to strengthen their knowledge, which will be the ladder towards achieving the social role of higher education institutions for the sustenance of special children. Their knowledge is a ladder towards achieving firm base for fulfilling the needs of adult special children.

## 2. METHOD

The methodology used in proposed system can translate native language into equivalent Sign Language using the technology so that parents can easily teach their deaf children at home even if they have not familiar with Sign Language, but they can also be learning

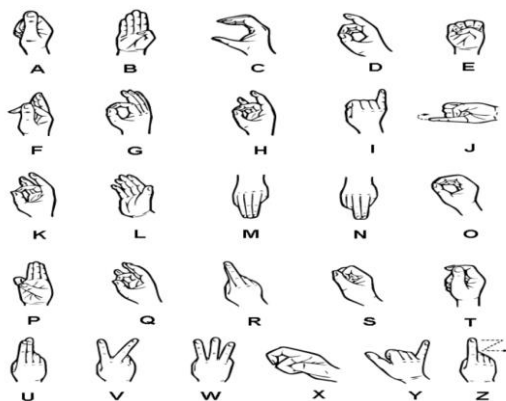
Sign people deaf, parents and teachers they can help deaf community in their education at the beginning and the academic based to deaf will be strong and when their based will strong they can easily move toward the higher education. For the purpose of the research, simple interview questions are designed with the aim of defining the research criteria. For this study, only Karachi, Pakistan, residents were chosen as participants. The interview was conducted at random with people of all ages, from five to sixteen, and genders. People from a variety of walks of life were used to gather the samples.

A total of 100 participants participated in this study. According to the study, the age range was between 5 and 16. The methodology used in the proposed system can translate native language into equivalent sign language using technology so that parents can easily teach their deaf children at home even if they are not familiar with sign language, but they can also be learning sign language. Parents and teachers can help the deaf community in their education at the beginning, and the academic foundation for the deaf will be strong. When their foundation is strong, they can easily move toward higher education. The deaf community can benefit from early parental and educational support, which will provide a solid academic foundation for the deaf community. They can progress toward higher education with ease if they have a solid foundation.

### 2.1. Proposed System

In proposed Interactive Triangular Global Model (ITGM), technology is used to make strong communication between

all three peoples (deaf children/students, parents, and teachers). If one talks about teachers of deaf mean they must be aware about the culture language of deaf i.e., Sign Language and can communicate with deaf communities. In ITGM the sign language alphabets, or letter are portrayed as a shape of hands will match with their corresponded text of natural language and convert the sign language symbols into natural language text, even the same system can be recognized the finger spell movie into related natural language text. The pattern of sign language based on the natural language (mother language) or culture language of deaf persons where they stay. The sing language is basically mapped on the natural language (see fig. 2). But the sign language not fully based on the grammar of natural Language so it is different from related natural language written and spoken language. The general translator for sign language which follow the alphabets of American sign language.



**Fig. 2. American sign language (ASL)**  
(Chong , 2018)

There are different combinations of the finger positions which recognize the sign patterns of in sign language (table-2). All the five fingers can bend at three different positions therefore with various arrangements of fingers will make the language for deaf persons which is of course quite difficult for the normal individual but not impossible. The rules use in sign language database mentioned in figure 4.

## 2.2. Suggestions

Education ministry has a social role of providing trainings to parents of adult special children, as to assure, that their existence in society and their sustainability is a collective responsibility of every sector. Parent education, in the form of adult education should be initiated to facilitate parent's knowledge related to sign language and other areas of development of deaf persons. Standard sign language should be drafted by all the stake holders and policy makers with the involvement of parents and NGOs, who are related to deaf.



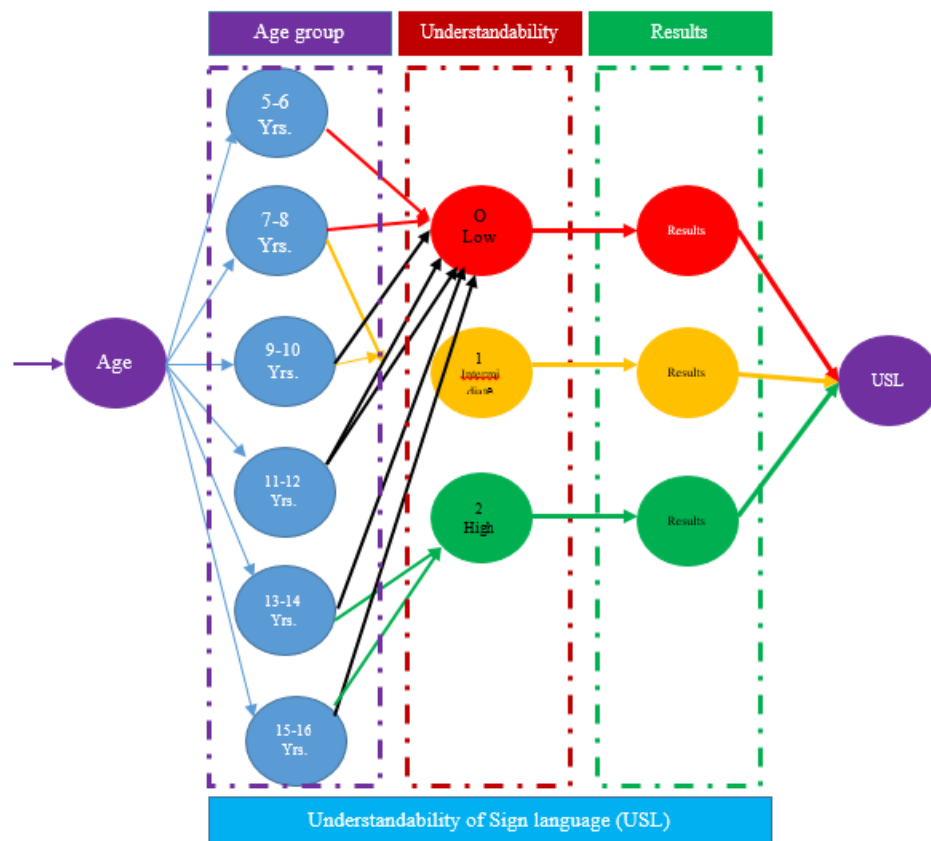


Fig. 3. Understandability model of Sign Language.

Communication in Native language

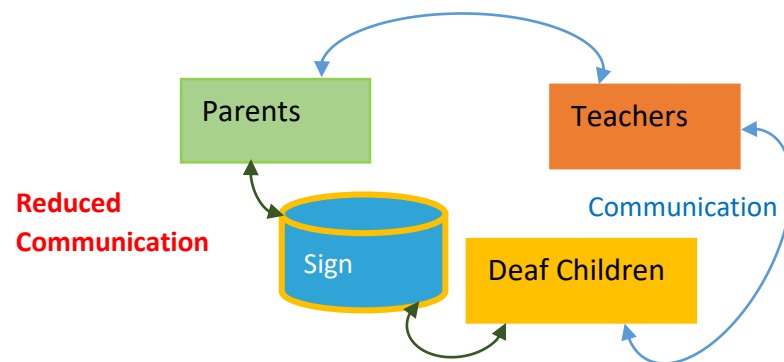
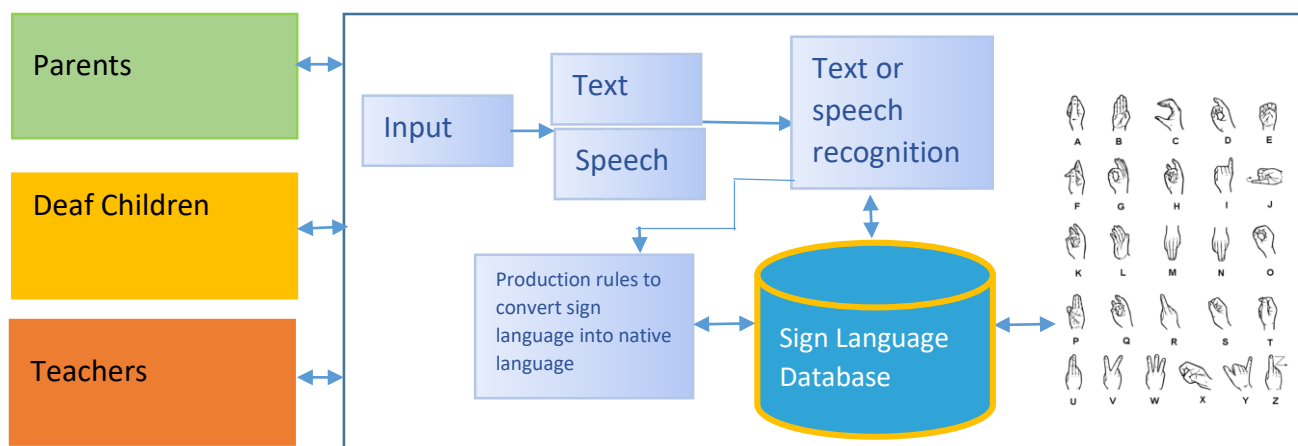


Fig. 4 – Technology based Interactive Triangular Global Model (ITGM) for communication between Deaf students, their parents and teachers

**Table-1: Set of Sign Language production rules used in Database of proposed System**

F→Fore finger M→Middle finger S→Small finger T→Thumb W→Wrist G→Gap Mo→Movement B→Bend Tw→Twist P <sub>1</sub> → Thumb at side of Index finger P <sub>2</sub> → Thumb at side of Middle finger P→ Thumb at side of Small Finger I→Index finger P <sub>4</sub> → Thumb at side of fore finger P <sub>5</sub> → Thumb at Index finger P <sub>6</sub> → Thumb at fore fi	P <sub>7</sub> → Thumb at Middle finger P <sub>8</sub> → Thumb at Small finger P <sub>9</sub> → Thumb in index finger P <sub>10</sub> → Thumb over Small finger Thus the language is L = {I, F, M, S, T, W, G, Mo, B, Tw, P <sub>1</sub> , P <sub>2</sub> , P <sub>3</sub> , P <sub>4</sub> , P <sub>5</sub> , P <sub>6</sub> , P <sub>7</sub> } As a→TP <sub>1</sub> b→IFMSTP <sub>7</sub> c→IBFBMBSBTBWMo d→ITP <sub>7</sub> : : : : z→ ITP <sub>7</sub> Mo
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**Fig. 5 – Backend process for Technology based Interactive Triangular Global Model (ITGM) for communication between Deaf students, their parents and teachers**

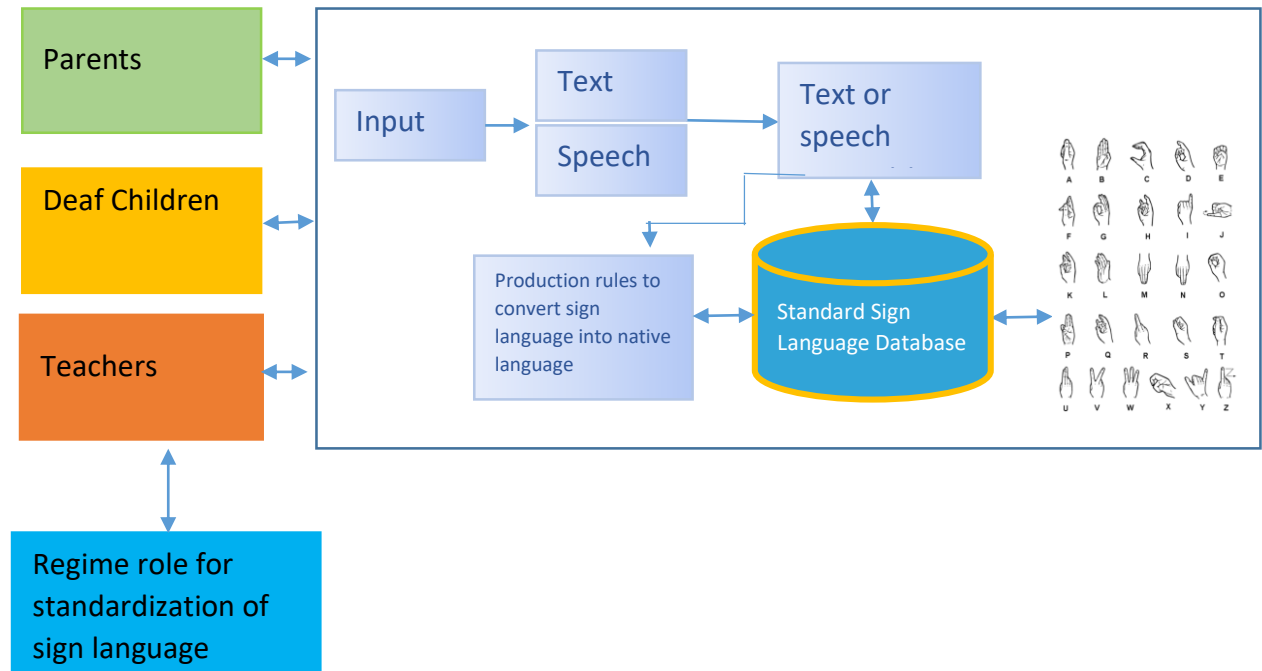
### 3. RESULTS AND DISCUSSION

The proposed Interactive Triangular Global Model (ITGM) is perfect to reduce the communication gap between deaf, parents and teachers. But if we are talking about our country Pakistan or other less developed and even developed countries there are no standard of Sign Language. In different region of the same country different types of Signs Language is being used. This create great confusion between all three users of the system which are

deaf, parents and teachers. The question is that how they can synchronize? as they have different types of language collection. Therefore, the involvement of regime (see fig. 7) is very important at regime level the Sign language is first standardized then implemented as a signal Sign Language. The proposed system will work perfectly on standardized Sign Language. The need for unanimity is of utmost importance to

bring standardization to fruition. In May 2020, a set of deaf students of different ages (5–16 years) in grades 1–10 was collected from three well-known institutions to work out a research report for Interactive Triangular Global Model (ITGM) support to

improve the degree of knowledge of parents of people with special needs (see table 2).



**Fig. 7. Involvement of Regime in Technology based Interactive Triangular Global Model (ITGM) with standardized Sign Language database**

**Table. 2 Representation of the Sample of Education level primary and secondary session of Deaf and dump students.**

Age Group	Age	Sample Size (N)			Understandability
		Institution 1	Institution 2	Institution 3	
1	5-6	10	25	30	0
2	7-8	15	26	31	0-1
3	9-10	20	25	35	0-1
4	11-12	25	27	30	0-1
5	13-14	20	25	35	1-2
6	15-16	19	25	35	1-2
Sample		109	153	196	2
Total Sample		463			

#### 4. CONCLUSION

To reduce the communication gap between deaf people, parents and teachers should A technology-based Interactive Triangular Global Model

(ITGM) is proposed to improve the degree of knowledge of parents of people with special needs so that they can easily and actively communicate and look after the academic activities of their children language from this system if they are



willing to learn it.

Deaf children can also translate sign language into their native language.

This is also observed: due to a lack of awareness and the technicality of sign language, most parents are unable to learn it and use the normal patterns of sign language (their own made signs), and as a result, they are unable to be as involved in their children's education as is required. On the other hand, children feel irritated when they do not receive as much educational attention at home as their normal siblings.

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