

# I CAN HEAR AND TALK (I-CHAT) AS ASEAN SIGN LANGUAGE COMPUTER APPLICATION FOR HEARING IMPAIRED

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**Abstract :** ASEAN Sign Language Computer Application for the Hearing Impaired, named I Can Hear and Talk (i-CHAT) is a computer based application which is designed to assist people, especially children with hearing impaired problem to master their linguistic capability. The first phase is Indonesian & Malaysian (Melayu) Sign Language. This application leads the user to learn Indonesian & Malaysia Sign Language and how to arrange affirmative sentences. The establishment of this application is expected to be beneficial for the Hearing Impaired community, students and teachers of School for Children with Special Needs and also useful for their parents, teacher and relatives. The purpose of this study is to make an alternative method of learning sign language using computer application.

## Introduction

ASEAN Sign Language Computer Application for the Hearing Impaired, named I Can Hear and Talk (i-CHAT) is a computer based application which is designed to assist people, especially children with hearing impaired problem to master their linguistic capability. The first phase is Indonesian & Malaysian (Melayu) Sign Language. This application leads the user to learn Indonesian & Malaysia Sign Language and how to arrange affirmative sentences. The establishment of this application is expected to be beneficial for the Hearing Impaired community, students and teachers of School for Children with Special Needs and also useful for their parents, teacher and relatives. The purpose of this study is to make an alternative methods of learning sign language using computer application. We ask authors to follow these guidelines and make the paper look exactly like this document. The easiest way to do this is simply to download this template and replace the content with the text of your manuscript.

As ICT products have developed into the many boxes, they have evolved from luxury gadgets for the few into essential tools for everyone who wants to participate to the fullest extent in our Information Society. Nevertheless, because not all potential user groups were considered while developing this technology and the services that are based on it, a considerable number of people are disadvantaged or

even excluded from using it because of lack of support for simple interactive text communication, for example.

The survey of PUSDATIN in 2010 shows that the population of disable in Indonesia, in line with WHO calculation estimated that 10% of Indonesian population (24 millions) are people with disabilities. We can see the complete data in the following table:

**Table 1. Disable People Population in Indonesia**

Category	Persons
Visual Impaired	3,474,035
Physical Impaired	3,010,830
Hearing Impaired	2,574,626
Mental Impaired	1,389,614
Chronic Impaired	1,158,012
<b>Total</b>	<b>11,580,117</b>

To break down barriers faced by disabled persons in area, this project has begun with initiatives to take initial step to promote accessibility & information by using the latest ICT technology (Web2.0, Open Source, Android Package and others), especially for people who are visually or hearing impaired.

There was collaboration and a preliminary discussion among team members and all agree to have a research in this topic in order to provide a significant contribution in removing barriers in access to information and communication gradually. And all researchers are ready to work in accordance with their professional competencies (ICT, Healthcare, Networking, Software Development, Teachers and Students).

## Problem Analysis

There are some factors why the hearing impaired, especially children with hearing impaired must get a special treatment:

- Due to their hearing impairment, children with hearing impaired are not able to experience their early stage language acquisition period (babbling period),
- The hearing impaired children are unable to develop their language capability, and
- This will lead to another problem for their communication, learning process or education.

Hearing loss will give significant impact to the whole development of children, particularly to their cognitive function development. A lot of efforts have been made to understand how the Hearing Impaired children think and comprehend something in relation to their cognitive function. Vygotsky (1962) stated that language and thinking are inter-related and influence each other. Thinking and language at the early stage are separated and developed parallel until children reach the age of 2 years. In this period, thinking and language becoming integral and influencing each other, later language can be used to think and what they are thinking can be reflected through their language.

The scope of the problem is regional in nature due to the similar language among the Southeast Asia countries. And the team has already recognized that Indonesia, Malaysia, Brunei and Singapore actually have similar syntaxes. Therefore, it is possible to address the problem at the regional level provided the required resources are available. However, this project will cope first at providing the application to Indonesia, Malaysia, Brunei and Singapore, but it is very much possible to extend the scope to the regional level.

Within this project we plan to invite several ASEAN countries which are exposed to Indonesian-Malaysia-Brunei-Singapore Sign Language Computer Application for The Hearing Impaired. We propose to involve relevant institutions from those countries such as Extraordinary School and University teachers and practioner.

The establishment of this application is expected to be beneficial for the Hearing Impaired community and teachers of School for Children with Special Needs and also useful for their parents, teacher and relatives.

Indonesian government has formed a cross institutions team to build a Sign Language Computer Application for the Hearing Impaired. This team comprises individuals from TELKOM R&D Center, DG POSTEL, Universitas Pendidikan Indonesia, and School for Children with Special Needs in Bandung, Jakarta and Surabaya.

The post implementation operational cost for this system is relatively small for equipment maintenance therefore in the long run the Indonesian government represented by Indonesian-Malaysia-Brunei-Singapore Sign Language Appli-

cation team will be responsible to cover the expenses incurred from the maintenance.

Indonesia and Malaysia are selected as the languages that used as development of i-CHAT Application. This is because the structure of Indonesian and Malaysia (Malay) is almost the same. But, nonetheless, the rules of sign language used by both countries are different.

Both Indonesia and Malaysia have two rules of sign language used by the public. In Indonesia there are SIBI (Indonesian Broadcasting System) which is generally used for educational purposes, while BISINDO (Indonesian Sign Language) is generally used in the community.

Actually, every region in Indonesia has its own sign language that is very different. They have difficulty understanding the different sign languages. Therefore, the idea to make Indonesian sign language, which is abbreviated BISINDO. BISINDO expected to be a national sign language as the same as Indonesian in general. BISINDO also has its own grammar.

BISINDO is still new and less known to the public at large. People are already familiar with SIBI (Indonesian Broadcasting System). SIBI is engineered systems and the creation of a normal person, instead of people with hearing impaired. As a result, the communities of people with hearing impaired are confused and could not figure out that there are differences between their natural sign language with the SIBI. Until now still going controversy between the originators SIBI with the community of people with hearing impaired in Indonesia.

People with hearing impaired decided that SIBI only used for school because of a gesture is not a genuine product of them. This can be seen many people with hearing impaired still wearing their original sign language. BISINDO is a communication system that is practical and effective for the community of people with hearing impaired in Indonesia being developed by their own. BISINDO used to communicate between individuals as equal as is the case with Indonesian in general.

With BISINDO, they can express their thoughts and feelings freely and express themselves as human beings a dignified Indonesian citizen in accordance with the philosophy of life and human rights.

BISINDO developed and disseminated through the organization container Gerkatin (Movement for the Welfare of the People with Hearing Impaired in Indonesia). At this time BISINDO center is reviewing the standard formulation, preparation BISINDO dictionaries and textbooks BISINDO.

Similarly with Indonesia, in Malaysia also applies two different rules of sign language, Kod Hand Malay (Kod Tangan Bahasa Melayu in Malay) and Malaysian Sign Language (BIM). KTBM sign language is formally used by students at schools.

KTBM is a sign language that follows the rules of the Malay language. Therefore, KTBM used in the process of teaching and learning.

Meanwhile, Malaysian Sign Language (BIM) is the sign language used by the community in Malaysia for daily life. BIM is a sign language rules that do not stress the structure of Malay.

Based on that information, i-CHAT Application developed within the rules of SIBI (Indonesian Broadcasting System) and KBTM (Kod Hand Malay) for the purpose of the early development of i-CHAT earmarked for intended as an alternative ways of learning to help people with hearing impaired (education).

## ASEAN i-CHAT Application

Language learning in School for Children with Special Needs is still using conventional methods:

1. Vocabulary introduction is done by bringing objects to the class or use the image. This method is less effective because every time the teacher will introduce a new word to the Hearing Impaired student should find the object in question and then bring it to class. Teachers can also introduce new words to students with hearing impairment to find the pictures, but keep the initiative from the teacher to get a picture that will be introduced.
2. Sign language dictionary used is in hardcopy. This dictionary shows only one picture which represents the sign language. We should read the description carefully. It often happens misunderstanding description written in the dictionary.
3. Children with special needs in hearing often have mistaken in the arrange sentences. Unlike normal people, children with hearing impairment have difficulties in sentence arrangement. They often make sentence not in appropriate order.

i-CHAT (I Can Hear and Talk) is a computer based application which designed to assist people, especially children with hearing impaired problem to master Malay Language (target of the 1st phase). Now, i-CHAT is available in two different languages, i-CHAT Indonesia consisting of modules SIBI and Bisindo, and i-CHAT Malaysia. Each modules in i-CHAT consist of 2 types of video i.e: sign language video and spelling video.

At the landing page, to access i-CHAT Indonesia, simply click Indonesian Flag, and to access i-CHAT Malaysia click Malaysia Flag. At this page we can also access several information such as introduction of i-CHAT, Forum, and photo gallery.

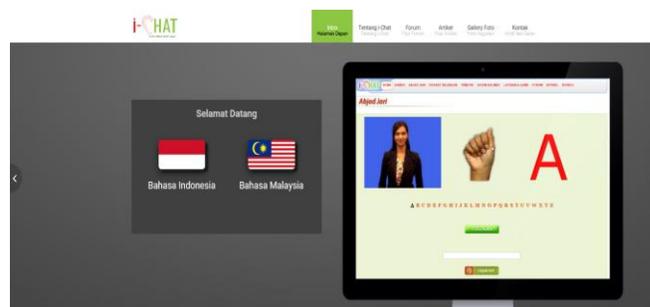


Figure 1. i-CHAT Landing Page

After choose the language, you will be bring into registration page. For the first user, you have to fill in the registration form, and activate the link that will be sent to your email. If you have already i-CHAT member, you can go directly login by fill in your email and password.



Figure 2. Registration Page

i-CHAT Indonesia consists of 7 modules of learning, Dictionary, Alphabet Finger Spelling, Gesture for Numbers, Writing Sentence Module, Thematic, Exercise & Game, and Bisindo. Meanwhile, i-CHAT Malaysia comprises four modules of learning, Dictionary, Alphabet Finger Spelling, Gesture for Numbers, and Sentence Writing Module. While i-CHAT Malaysia consist of the main modules those are Dictionary, Alphabet Finger Spelling, Gesture for Numbers, Writing Sentence Module.

A. Dictionary Module

This module has the same function just like common dictionary, but in this application the module will be used to show sign language video or speech reading video of the selected word.

Dictionary module in i-CHAT Indonesia is a digital form of dictionary SIBI (Indonesian Broadcasting System), which consists of 5,000 words sorted by alphabetical order. While the i-CHAT Malaysia consists over 1500 words by using Kod Tangan Bahasa Melayu (KTBM).



Figure 3. Dictionary Module

B. Alphabet Finger Spelling Module

Finger Spelling Module is used for spelling abbreviation, person's name, and any words that don't have sign language.



Figure 4. Alphabet Finger Spelling Module

C. Gesture for Number Module

This module is used for learning numeral sign in any type of number, so the students can show the sign of numbers they want to tell.



Figure 5. Gesture for Number Module

D. Writing Sentence Module

Writing Sentence Module is prepared to arrange systematic sentences, where the selection of words are done by typing the desired words in the text area. This module is completed with auto suggestion to enhance and fastening word writing process.

To give the better experience of using this application, each video in dictionary or writing sentence module also show us the web cam video of the user, so the user can train their sign language by imitate the video demonstrate by the i-CHAT model.

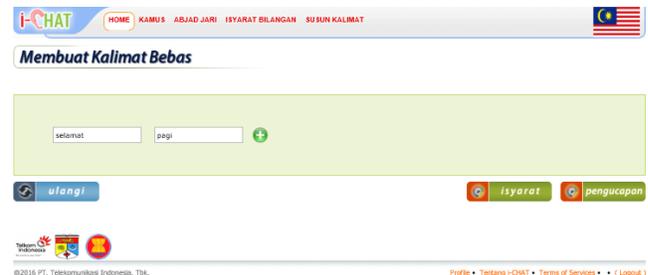


Figure 6. Sentence Writing Module



Figure 7. Sign Language Video and User Webcam

Conclusions and Recommendations

Based on initial assessment, hopefully, the establishment of i-CHAT application is expected to be beneficial for the hearing impaired community and teachers of School for

Children with Special Needs and also useful for their parents, teacher and relatives.

Delivery methods that applied in the i-CHAT application is very simple. Each module is equipped with two types of video, video signaling and pronunciation video that is indicated to facilitate the user to learn the application of i-CHAT.

In addition, the operation of the application was considered to be very user friendly, because each module is equipped with pictures and instructions for use (tutorial). Users can also download applications i-CHAT offline.

With the application of i-CHAT, which in the early initiation implemented in Indonesian and Malaysia, expected future i-CHAT application can be implemented and impact more widely, especially in the realm of ASEAN in advance. Obviously with the language rules that are tailored to each country. For the next project, we propose to build and implement i-CHAT for other countries, especially among ASEAN members and bring this application into mobile application so user can access i-CHAT through their mobile gadget.

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