

Collaborative Learning Environment Tool In E-Learning Management System for Deaf and Dumb Students : An MVC Architecture

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ABSTRACT

Today e-learning tools are generally used in learning method. E-learning involves computer and electronically supported learning (Web-based) and teaching (Virtual) methods. E-learning method has contributed in facilitating education for deaf and dumb people. In this paper we study about how deaf and dumb students can use or benefits from e-learning system. Deaf and dumb people are able to get benefit from this skill by growing their knowledge and improving their skills. It can be utilize the mobility feature to learn anywhere and at any time. Utmost of the deaf and dumb students easily learn and develop skill and knowledge in the course of e-learning method.

Keywords : E-learning System, MVC Architecture, Collaborative Learning Environment Tool, Indian Sign Language, LMSDS Method

I. INTRODUCTION

E-Learning courses are providing all the people including the physical unchallenged people. It is a good useful way to all the Blind, Deaf, Dump etc., E-Learning is creating a self-confident, self-motivation, and time management, etc., The physically unchallenged people is struggling to collaborate ordinary people for studying schools and colleges even the working places correspondingly.

But this E-learning delivers self-assured to get knowledge and access the internet using Technologies, Tools and gain knowledge in all the subjects. 80% of physically compromised people to studying E-Learning and get Jobs in particular fields.

Now a day all the people is using to many technologies and tools in the computers, laptops, palmtops, and all internet connected devices. But now all the applications and tools are available in the

Android devices. Android is most powerful to collaborating all the people. So all are using these Mobile devices to use anytime, anyplace, anywhere. It is effortlessly to afford all the materials, sending assignments in anytime and anywhere.

1.1 What is Communication?

“It is a process of communicating or exchanging Ideas, Thoughts, and Feelings, Information in form of verbal or non-verbal message”.

1.2 Human Communication Types

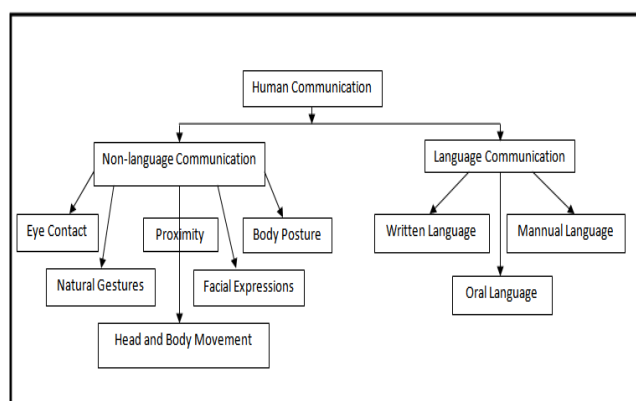


Figure 1. Human Communication Type

1.3 E-Learning

A learning system established proceeding recognized instruction with the benefit of computerized properties is well-known as E-learning. While education canister be based in or out of the classrooms, to use computers and the Internet forms the major constituent of E-learning.

E-learning can also be elected as a network enabled to transfer of the skills and knowledge, and also the delivery of education is made to a large number of addressees at the same or different times. Anterior, it was not accepted enthusiastically as it was assumed that this system required the human element required in learning.

II. METHODS AND MATERIAL

2. Deaf and Dump Learning

There is no enough staff to teach deaf and dumb, that make it cost. Deaf and dumb people need a special way to teach they need special teachers who know their state of psychosomatic who know how to communicate them and how to pronounce the word carefully to save and understand it. The deaf and dump children found the difficult to understand the

lesson because they incapability to earshot and speaking.

2.1 Types of Deafness

There are different types of deafness; profoundly deaf, severely deaf, hard of hearing, etc., of course there are many different types of deafness out there, caused by different things, but I want to just focus on a few.

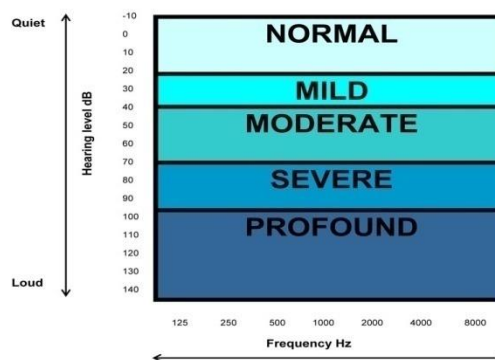


Figure 2. Types of deafness

Deaf and Dumb/Mute

Whilst it is important to know the different types of deafness and how to adjust access to suit these different levels, it's important to remember that these are labels. These labels will mostly be used within a medical environment in order to discuss appropriate technology to support each individual.

Each deaf person is different, with different needs and communication methods. What's important to remember is not the label, but the identity of the individual. Having any form of hearing loss does not automatically make you identify with the deaf community.

2.2 Methods of E-Learning

E-learning is providing all the opportunities to deaf and dumb people. People to improving the education level and gain knowledge for all subjects and easily get job. The real improvement of deaf and dumb people is using internet and send assignments, and

listening the video and reading study materials, communicate one another using related software. So improve our self-confident to improve our self.

So many technologies are helping for deaf and dumb people. The following technologies using to build the knowledge of deaf and dumb people

- Sign Language.
- Multimedia Education.
- LMSDS.
- Sharojan Bridge.

3. Sign Language

Deaf peoples are communicating through sign language. [1] Today it is one of the most growing research fields. Many new technologies have been developed recently in these fields. A system of communication using visual gestures and signs, as used by deaf people. World health organization reports say in 2015, 360 million people all over the world are deaf hearing difficulties. This sign language is very useful to studying to the deaf and dumb people.

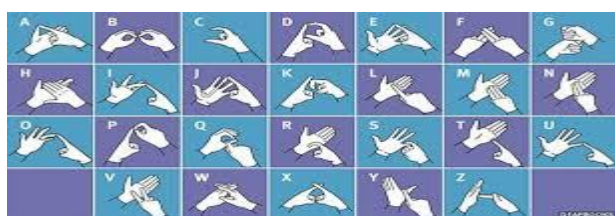


Figure 3. Two hand sign language

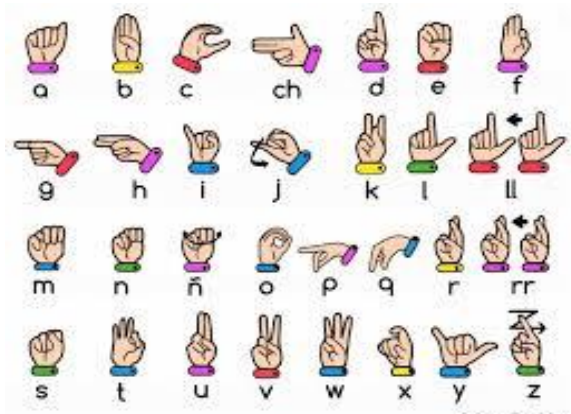


Figure 4. Single hand sign language

Deaf and dumb are communicating through sign language. To assist deaf people with their study materials translated in to the sign language based on the e-learning technology. The user-friendly of multimedia telecommunication and internet information services as used as a standard electronic platform to support deaf and Dump people.

3.1 Importance of Sign Language

Deaf people communicating, learning only in lip reading, sign language, gesture and facial expression. In their class room also the teacher must use sign language for teaching. In India we follow Indian sign language (ISL). It has more signs. The ISL videos available in internet it's very difficult to communicate deaf peoples without sign language. Using the sign language interpreter they can easily share and gain knowledge. Now a day's sign language interpreter available in all places including schools, colleges, hospitals, police stations, court, hotels, restaurants, etc. in one of the T.V news channel provide sign language news especially for deaf and dumb peoples.

E-learn system is important to deaf people for gather knowledge. To implement e-learn we need the following [1].

- Virtual classroom with all devices
- Text and video materials
- Sign language dictionary.
- Computer and communication devices
- Sign language interpreter
- Hand sign images
- Sign language educational content video
- Sign language learning video

4. Multimedia Educations

The use of multimedia in teaching and learning presents challenges to institutions of higher learning. [2]Multimedia refers to any computer mediated

software or interactive application that integrates text, color, graphical images, animation, audio sound, and full motion video in a single application

4.1 Importance of Multimedia Education System to Deaf Child.

Use of traditional education tools for children is not attractive way, but when using games and multimedia tools it will be more attractive. The deaf children found it difficult to understand the lessons because the inability to hearing and speaking. Multimedia tools will make these children respond to the education and facilitate the delivery of information to them. In Schools They don't use methods for development of child's intelligence, but our main idea is to strengthen a child's intelligence and learn new skills

There is no enough specialist staff to teach deaf and dumb children, that make it high cost.

Deaf and dumb children need a special way to teach. They need special teacher who know their state of psychological, and to know how to communicate with them and how to pronounce a words carefully to save and understand it. And there is no enough teachers know how to do that. And when the school what a teachers they need a high cost to nomination them.

Challenges

- Use of traditional education tools for children is not attractive way
- The deaf and dumb children found it difficult to understand the lessons because the inability to hearing and speaking
- They don't use methods for development of child's intelligence

4.2 Methodology

Software engineering method will be used and waterfall model is the suitable model for this kind of

software due to it is very simple to understand and use, each phase must be completed in its entirety before the next phase can begin, At the end of each phase, a review takes place to determine if the project is on the right path and whether or not to continue or discard the project. Dark Basic Professional and 3D MAX, Photoshop, Fps creator, movie maker, 3d world studio was used to build and implement the system, Dark BASIC Professional is the most advanced games development package built on the BASIC language currently available, 3D max.[2]

4.3 Data Model Use Case Diagram

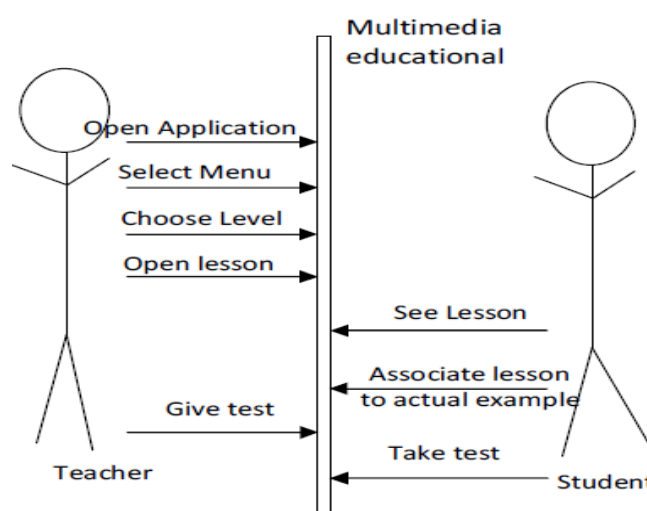


Figure 5. Use case Diagram

5. LMSDS Method

Learning Management System is used for Deaf and Dumb students to learn the lip movement language. [3] Effectively without the need of human effects. The map the natural speech to the lip shape animation.

This method is working on two sides client and server. In LMSDS server side is used by the tutor. Where the tutor can act as the administrator, teacher and manage the student group. Then tutor able to speak the content though the microphone, and convert into the text, and then the text will be send

to the client (Students), where the converted text will be synchronized with the animated lip.

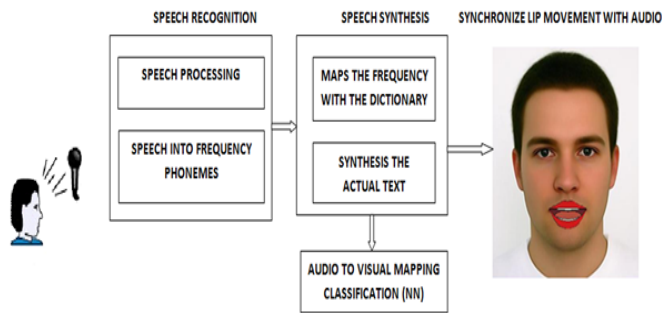


Figure 6. System Architecture

The system consists of 3 parts:

- Speech Recognizer
- Speech Synthesizer
- Synchronize Lip Movement with Audio

Speech Recognizer

- Input the speech through the input device (mike).
- Recognize speech signals by a recognizer
- Samples the speech into frequency phonemes.

Speech Synthesizer

- Input the sampled frequency phonemes.
- Maps the frequency with the dictionary.
- Synthesis the actual text.

Synchronize Lip Movement with Audio

- Input the synthesized text.
- Text is sampled as frequency phonemes.
- Viseme classification is done and mapped to an animated lip control.
- Based on frequency phonemes, audio is produced[3].

III. RESULTS AND DISCUSSION

6. Sharojan Bridge

The SHAROJAN BRIDGE will make the communication easy between the disabled people based on the extent of their abilities. [4]In this approach we are considering all the possible combinations of the disabilities of Blindness, Deafness and Dumbness by which a person can suffer. This device called the Sharojan Bridge will take the input message from the differently able sender as per his abilities and facility and convert that message to be transferred to long or short distances as per the requirements. Once the message is transmitted to the receiver then it is again converted as per the facility and abilities of the receiver. We have come across several combinations that are possible in case of the three above mentioned disabilities and the solutions to these possibilities.

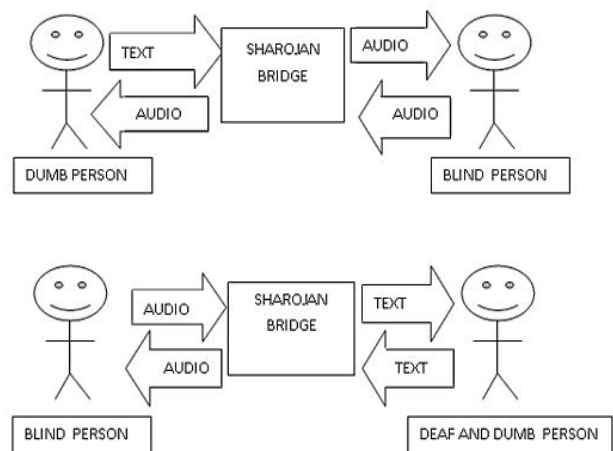


Figure 6. Communication between dumb & blind person and blind & deaf, dumb person

6.1 Sharojan Bridge Architecture

Sharojan Bridge is proposed for easy communication among Blind, Deaf and dumb people. The working of system for transmission of message from one disable person to another person. The input taken from user for sending message, input can be audio, text or Braille language. Message is send to disable person

through the LAN or internet. Output is given to receiver; audio output is given using speaker. Braille language output is given by using Braille converter. And text message displayed on LCD or screen. For example, for communication between dumb and blind person. The input for dumb person is text or gesture and output to blind person is audio or Braille output. [4]

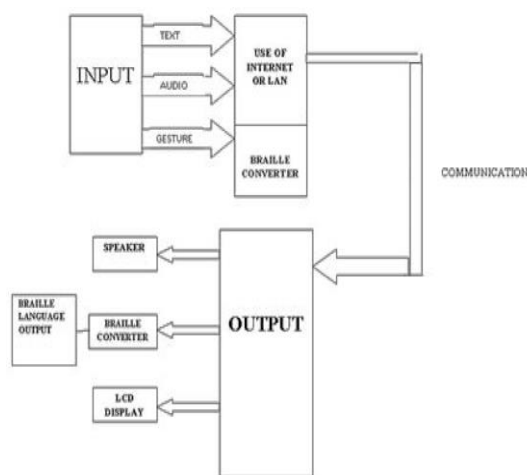


Figure 7. Architecture

7. Challenges of Physically

IMPAIRED PEOPLE IN E-LEARNING

- The physically impaired people are struggling to open all the web contents and navigate the pages. All the tools and applications is available but sometimes physically impaired people is need to somebody help to open the software and handle the software. So they are struggling to use the technologies.
- The relevant tools and applications is not easily to get our mobile phone and laptop so that time people are struggling.
- Hearing impairments (deafness and hearing loss): have difficulties detecting sounds or distinguishing auditory information from the background noise. Deaf individuals cannot receive any auditory information at all. Many of them communicate through the Sign Language

that differs significantly from the spoken language. Cognitive impairments (including cognitive, language and learning disabilities like attention deficit disorder, dyslexia, dementia, etc.): there are a wide range of cognitive impairments, including impairments of thinking, memory, language, learning and perception.

7.1 Assistive technologies

Assistive or enabling technology includes devices, tools, hardware, or software, which enable, partially, people with disabilities to use the computer. It presents an alternative way to access the content on screen, command the computer or process data. Specific adjustment software or devices for manipulating the computer include,

- Screen reading software (speaks displayed text and allows simulating mouse actions with the keyboard).
- Alternate input devices (e. g. Screen keyboard) and special keyboard (to make data entry easier).
- Keyboard enhancements and accelerators (like StickKeys, MouseKeys, repeat Keys, Slow Keys, BounceKeys, or ToggleKeys), mnemonics and shortcut keys.
- Alternative pointing devices (e. g. Foot operated mice, head mounted pointing device, or eye tracking systems).

These aiding technologies can be either devices or equipments (hardware) e.g. Braille, or software applications e.g. screen reading software. However, these technologies do not seem sufficient for providing full support to people with disabilities. Web content providers should also participate in the inclusion process by making arrangements that allow particularities of people with disabilities to be taken into account when creating web content. Several efforts were conducted toward addressing this issue.

8. Proposed Solution

Presently all the software and supporting applications are used by deaf and dumb people with third-party help (support). My solution supports in using of software or applications without any one help, which is they can handle by themselves.

8.1 Proposed Architecture

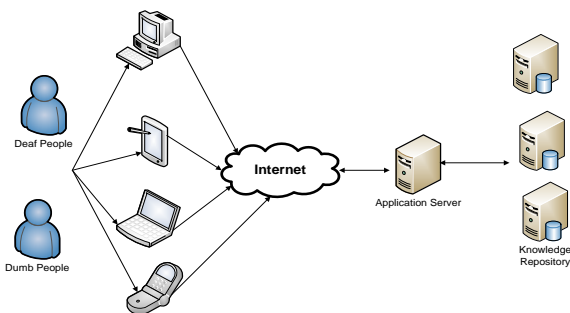


Figure 8. Proposed Architecture

8.2 MVC Architecture



Figure 9. MVC Architecture

8.3 Devices used by deaf and dumb

- Sign Language Keyboard
- Sign Language Translator
- Tele Typewriting
- High Resolution Camera
- Hand Gesture
- Sign Language Glove

Sign Language Keyboard

The keyboard uses emoji-style hands portraying accurate signs and shapes. It will convert the sign language into text.

Sign Language Translator

If we enable the Sign Language Translator it will convert the input into text or video Sign Language.

Tele Typewriting

A TTY is a special device that lets people who are deaf, hard of hearing, or speech-impaired use the telephone to communicate, by allowing them to type messages back and forth to one another instead of talking and listening. A TTY is required at both ends of the conversation in order to communicate.

High Resolution Camera

It will be used for proper translation of sign language.

Hand Gesture

The deaf-mute people can use the gloves to perform sign language and it will be converted into speech; and the speech of normal person is converted into text and corresponding hand gesture, so the communication between them can take place easily.

Sign Language Glove

A sign language glove is an electronic device which converts the complex motions of a sign language into written or spoken words. A model being currently created at the University of Reading is one of the few to utilize two hands, attempt signs that involve motion, and make it relevant to Indian Sign Language.

8.4 Process Flow of Sign Language

Keyboard

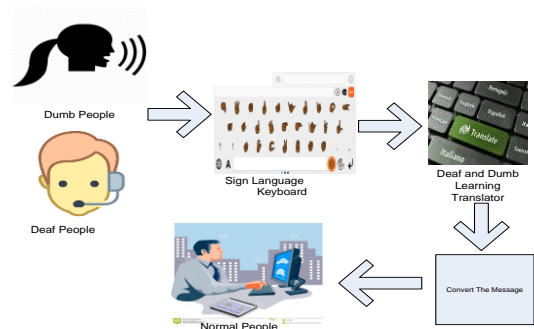


Figure 10. Process Flow

IV. CONCLUSION

Deaf and Dumb people to need distinct tools and also pertinent software which is spontaneously builds and starts to run. Towards this the Deaf and Dumb people can be directed handling in this software if it will be developed, along with this the people can also be made to work in E-Learning tools to make use of in collaborate with all the people in all the places.

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