Ease of E-learning for special need persons: Using E-learning Utility

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Abstract- Increasing strength of students' day-by-day over worldwide is a big challenge for any education institution to manage them. From past few years individuals with disabilities also shown their interest to obtain meaningful education like others, but due to their limitations they are unable to get the complete benefits of these learning technologies or tools as a non-disabled individual does.A strong need was felt to produce a solution in form of some utility to enhance the capabilities of such individuals so that they can participate in activities of life, getting education opportunities or make their life simpler or easier.

This paper proposes an E-learning utility which primarily targets people with hearing, vision or learning impairment as a possibility of alleviating the problem faced by persons with such disabilities and it will definitely be improvise the Distance learning concept.

Keywords— Adaptive technology, Distance education, Disability, E-learning, Impairment

I. INTRODUCTION

Distance education or distance learning is a field of education that focuses on teaching methods and technology with the aim of delivering teaching, often on an individual basis, to students who are not physically present in a traditional educational setting such as a classroom [1]. It has been described as "a process to create and provide access to learning when the source of information and the learners are separated by time and distance, or both. Distance learning is primarily a goal of removal of barriers to learning. Evolution of distance learning have breaks the barriers and provide an opportunity for those students or learners who are incapable to invest a lot of money or travelling long distances to get educated and for students with disabilities, a determined effort to provide education in a suitable form that overcome the disability. Distance learning provides the capability to get access and share the knowledge from any location.

Increasing access to more students is a common reason given for providing instructions in a distance learning format. However these access arguments usually focus on people separated by distance and time rarely include consideration of the needs of people with disabilities. According to American disability act people with disabilities have equal access to public program and services. According to this law, any individual shall by reason of their disabilities, be excluded from participation in these programs [2].

Individual with disabilities who would have trouble in travelling to or navigating a campus, or those for whom sitting in a college classroom would be challenging, have the benefit of widespread online education programs that allow individuals to complete their degree requirements at home [3]. Students with disabilities can also choose a combination of online and in-person classes to fulfil their degree requirements. Distance learning benefits disabled students because the course options allow students to take the courses that best meet their needs and abilities.

Education for all is one of the goals that all countries should achieve for better livelihood. This goal caters for both children and adults with disability. One of the educational modes that make this possible is Distance Education. Distance learning program provides postsecondary educational opportunities that may not be present at conventional universities for students with disabilities.

Distance learning is also a great tool to help students who are in geographically remote areas and may not have readily available access to educational facilities or who want to explore opportunities not offered by their local schools or colleges. Many schools and educational institutions are now being put up with a focus on distance education and even many popular and well-respected educational institutions around the world now introduce distance education programs in many of the educational courses they offer [4] for their students.

Distance learning through Internet (e-learning), provides the rich promise and potential of learning delivery at anytime, anywhere, on any topic: international courses (fully inter-cultural, with learners-teachers from all over the world), relevant learning efficiency, just-in-time learning, higher degrees of inter-activity and communication.

These new forms of distance learning particularly offer a number of opportunities for persons with disabilities to overcome certain physical impairments (e.g. visual deficiencies, hearing problems, difficulties resulting). Distance learning provides facility to access knowledge, services without travelling [5]. Distance learning provides ability to these individuals to break the isolation that disabled people feel in their life and by restoring a social identity for them, but all these things are not gone in easy steps. Individuals suffering from such disabilities require more attention and easy access of all available educational tools so that they met their requirements.

Today is the time of computers, laptops, tablets and android based mobiles that provides a dramatically change in way of learning and teaching. This device enhances the learning abilities of students to a great extent. But in case of person with disability who are unable to access or getting the benefits of these devices they offered, these devices are not sufficient enough to serve for this purpose. This disorder can make it problematic for a person to learn as quickly or in the same way as someone who is not affected by a learning disability.

This paper describes the detailed description of functionality of E-learning utility for helping individuals having physical disabilities.

Section II describes the shortcomings of the current distance learning methods. Section III discusses the learning Utility and its features. Section IV contains the Implementation details of this utility. Section V Advantages of this utility and Section VI concludes the paper.

II. SHORTCOMMING OF CURRENT LEARNING METHODS

When developing courses for online sharing, it is essential that educators are equipped to meet the requirements of all potential members, which may includes individuals with some specific disabilities also. Individual suffering from such disabilities

Traditional classrooms are the most common education scenario available worldwide in which one instructor surrounded by multiple students. Person with disabilities are feeling insecure or unable to participate in this environment. They feel afraid or shame because of their disabilities. Some other drawbacks still occur in current education tools.

- Individuals growing up with disabilities are unable to use mouse, keyboard normally. They need some technology to make their work easy without using these devices.
- Person suffering from blind or low vision problem are unable to view contents on screen easily due to small screen resolution.
- Special training is needed for instructors to teach students having such disabilities.
- Users using hearing aids experience disturbance from digital mobile phones, while people who have physical impairments may find it hard to hold and activate the buttons on mobile devices.

III. .FEATURES OF E-LEARNING UTILITY

We believe people with disabilities should have the same opportunities as others. Unfortunately, they often lack some of the skills they need to experience these opportunities. Computers and mobile devices have done a great deal to allow individuals with physical or mental disabilities to participate fuller life. Computers and mobile devices can help disabled

people in many different areas of life including working, reading, and communicating. For this purpose E-learning utility is used to provide greater advantages over these limitations.

E-learning utility provides functionality to support several local languages that makes easy to understand for individuals with some learning disabilities. E-Learning utility can be designed and developed with following feature set:

FOR BLIND/LOW VISION

- Text-to-speech facility.
- Talking word processors with talking spell checking system.

Blind or Low vision persons are unable to see information display on screen. On screen keyboard is not beneficial for them due to their low vision impairment. Such persons needed some adaptive technology or tools that empower their ability to read and write in normal way as others. This utility serves a functionality that enables such users to read and write computer or electronic device screens easily.

FOR MOBILITY IMPAIRMENT

- On screen keyboard facility
- Allowing for mouse less operation

Persons who have limited use of their hands or arms feeling problem in making use of keyboard or other pointing devices like mouse or sometime they unable to make eye-hand coordination while using pointing devices. People with such disabilities struggle to carry out one or more functions with ease by an average person

FOR HEARING/HARD HEARING

- Transcript for audio based files
- Blinking lights and vibration alert facility when any application open or close.
- Translate sign language into text

Persons suffered from hearing problems needed a tool which enhances their hearing impairment functioning in a predominantly hearing world. Person with hearing disability having problem in communicate or unable to hear voice commands. Sign language is good option to communicate with them. This utility provides functionality to immediate translation of sign language into text on screen available in multiple languages. After configuring this utility user will able to see the information or content on screen in his/her understandable language.

The basic idea behind this utility is to help individuals with disabilities to break the barriers of their limitations so that they

can get similar opportunities and also lives a normal life as others.

IV. IMPLEMENTATION OF E-LEARNING UTILITY

The implementation of this e-learning utility based on the idea to provide similar benefits to individuals with disabilities so that they can learn and grown up their knowledge as non-disabled individuals. This utility provides facility to see information displayed in user understandable language. User will able to select any language other than system default language which is more understandable for user.

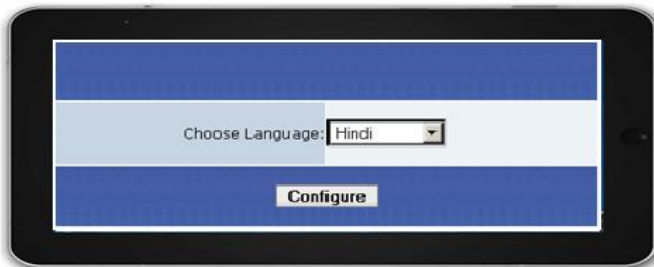Figure 1. Type of disability interface

Figure 2. Language selection configure interface

FOR BLIND/LOW VISION
This process provides options for blind or low vision persons so that they can use computers or other mobile devices in normal way.
Features of the process are:-

   i)   Automatic text-to-speech conversion.
   ii) Audible feedback
   iii) Audible cues to indicate services like low battery, caller waiting.
   iv) Talking word processors with talking spell checking system.

FOR HEARING OR HARD HEARING

This process provides option for person with hearing disabilities to make use of sign language into text appeared on screen. User signs captured by standard camera integrated in

laptops, pc, tablets and their signs are immediately translated into text which can be read by person with such disabilities. Features of the process are:-

   i)   Transcript for audio based files.
   ii) Provide alternative text with every video files.
   iii) Blinking lights and vibration facility
   iv) On screen keyboard facility
   v)   Sign language conversion into text on screen

Figure 3. Audio-text Conversion interface

Figure 4. On screen keyboard interface

FOR MOBILITY IMPAIRMENT/LEARNING DISABILITY

This process provides options for individuals who have limited access of their hands or arms.

Features of the process are:-

   i)   On screen keyboard facility
   ii) Predictive Texting
   iii) Information present in format in which student control pace of instruction.
   iv) Provide written text instructions.

V. ADVANTAGES OF E-LEARNING UTILITY

Main advantage of this utility is to enhance the capability of an individual with disability which restricts them to take participate in life activities. Using this utility they break the barriers of their disability limitations and get similar opportunities to improvise their knowledge and skills as others. This utility provides creative solutions that enable individuals with

disabilities to be more independent, productive and included in society and community life.

Implementation of this E-learning utility has following benefits:

- Disabled persons feeling unsafe in travelling from one location to other, for them distance learning is good option.
- Interact to a great extent with non-disabled individual.
- Benefits from opportunities that are taken for granted by individuals who do not have disabilities [6].
- Participate in and contribute more fully to activities in their homes, schools or other places [6].
- Improvising the concept of distance education.

ACKNOWLEDGEMENT

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