

Literature Survey of the Need in E-Learning for Differently Abled Learner by Conversion of Images to Sound

¹Dr. T. Nalini , ²Dr. V. Khana , ³Ms. R. Senthamarai

¹Assoc. Professor, ²Dean, Dept of IT, ³M.Tech, III year
Bharath University

I. INTRODUCTION

Education has been witnessing a rapid acceleration of changes in information and communication technologies (ICT) in the past few years. Enlarging the scope of interaction and interactivity between the teacher and deaf pupils in the classroom environment is crucial to enable effective learning. However, this synergy requires a flexible environment that can be achieved through a centralized e-learning system that can offer interactivity among the learners and instructors [6]. The reading/writing and mathematical skills exhibited by deaf people are well below that of hearing people, although their mental capabilities are basically the same. There are few further education programs for the deaf to make up for this. The ones that exist specialize in furthering the knowledge in special areas, such as home economics or woodwork and do not use sign language as means of knowledge transfer [1].

Although it is possible to ‘measure’ and describe a person’s hearing ability in a variety of ways, understanding speech is a very complex process that can involve the eyes as well as ears and brain. It is therefore possible for a student with ‘less’ measured hearing to actually be able to understand what is being said better than another student who has ‘more’ measured hearing. Hearing disability can change over time, and can also involve tinnitus (‘hearing ‘internally generated’ sounds) or additional disabilities [3]. Many sign language researches use a concatenated synthesis system based on data collected with a “Data Glove” such as a machine interpreting system that translates written Japanese to Japanese Sign Language and vice versa [4]. Traditionally the approach to deaf education has focused on comparing deaf learners with hearing learners, without viewing deaf people as visual learners with different learning behaviors. The social cost of this situation is enormous: deaf people are often excluded from written communication and, in many cases, they cannot perform professional tasks involving minimum competences in written language and cannot access higher levels of education [19].

The similar is the case with the visually impaired learners. For many blind people educational choices are made based on which material can be accessed and which cannot. Uppermost for many in choosing their educational and subsequent career path is the notion that studying scientific subjects is difficult due to the highly graphical nature of much of the material presented [7]. Access to information is major problem for the disabled in India. The visually impaired in India till today depend on two primary sources for their information. One is Braille Books and the other is talking book service [13]. Blind people often use text-to-speech synthesis when they work on the computer. Using a Braille line to convert digital texts into embossed writing is slow and requires extra hardware. Relying more on TTS technology, however, lessens blind people’s exposure to the written form of words which is especially important when studying another language [14]. One of the main deprivations caused by blindness is the problem of access to information. Visualization is an increasingly important method for people to understand complex information, and is presented using tables, graphs, diagrams and images. Sight-impaired students are at a severe disadvantage in this type of learning environment, particularly those who have been blind from birth or an early age. Computing theory is a combination of logical and physical abstractions, invariably taught to students using conceptual diagrams or figures containing shapes of different sizes together with other visual effects such as shading, color and sequence [2].

The major challenge facing visually impaired students in the educational environment is the overwhelming mass of visual material to which they are continually exposed in textbooks, class outlines, class schedules, chalkboards writing. In addition, the increase in the use of videotapes, computers, and television adds to the volume of visual material to which they have only limited access. Overcoming a students' visual limitation requires unique and individual strategies based on that student's particular visual impairment and his/her skill of communication [5].

The e-Learning market has been slow in developing courses for use with screen readers, speech recognition software and other adaptive technologies. The technology is there but people can't use it in a way that could certainly benefit them most. Although present software systems are often very sophisticated and user-friendly they are not very convenient for visually impaired people [18]. A visual on a screen is of no use to someone who is blind. Nonetheless, there are many solutions for this problem today and hopefully even more in the near future [8].

II. MOTIVATION OF THE RESEARCH:

Nowadays web is providing unprecedented access to information and interaction for not only a special group of people, but also people from any age and different groups. One important group of Internet users is people with disability. One group of the disabled people are deaf persons. Deaf persons have a special talking

language [1]. They are using Sign Language (SL) which uses manual communication, body language and lip patterns instead of sound to convey meaning. Simultaneously, combining hand shapes, orientation and movement of the hands, arms or body, and facial expressions are used to express fluidly a speaker's thoughts [15]. Hence for the disabled person the way of getting information from the network remains as the major problem which has to be solved by any method. In this the visually impaired and hearing impaired persons are more affected in accessing the information. Spelling Skills for Blind Language Learners design process of orthographic feedback in a computer-assisted vocabulary learning (CAVL) application that is targeted at blind language learners is performed. The major drawback is that the content of the vocabulary trainer as well as evaluation methods are not perfect [14]. In case of the hearing impaired persons a Strategies for Italian Deaf Learners is one method utilized where an interactive e-learning environment where adult deaf people can improve their literacy skills non-verbal understanding of concepts will provide deaf learners with increased access to the meaning of language structures.

I. RELATED WORK:

Mahaet *et al.* [9] have proposed the effects of e-learning modules of tutorial lessons for Hearing Impaired (HI) students on their motivation towards learning the related subject of tutorial lesson. Lessons pertaining to the topic of General Science for 2nd Standard of Indian Schools have been selected as experimental e-lessons. However these e-lessons were tested by real environment of HI class through Experimental cases in Apte Prashala, Ekattmak Shikshan Yojana, Pune. Idea of developing tutorial lessons was to develop a Generic for e-learning modules for HI students then using this Generic software to introduce experimental tutorial e-lessons of General Science topic. This Generic software includes two projects: one for teacher of HI students the second for teaching HI students themselves. To cover all categories of HI students the Generic software displays the instructional material via four modes of communication. Tutorial e-lessons generated by the Generic software are supported by pictures as well as the text of lesson. Integrating information and communication technologies (ICT) in education was a very important factor to learning, regarding student centered learning environments. Special education thus, was a field where mobile technologies can be used very efficiently for less financial burden due to its small scale in student number in normal schools. These technologies are also known as assistive technologies for learners in special education context. Ferhan *et al.* [10] have proposed a method to help hearing impaired students to use mobile information and communication technologies effectively and independently, and provide them with learning and communication opportunities enriched through mobile technologies. The project consisted of different levels of planning.

karimet *et al.* [11] have proposed an effective technology to support Deaf Students so as to learn various topics via computer. The major core of the mentioned technology could be represented by two branches: The first was to offer an empty template to the first user "The teacher who seeks introducing e-learning modules (eLMs) for his own interest topics for the Deaf candidates". Their system would reconstruct the entry material by the teacher so that to be an e-learning module of tutorial lesson according to the submitted material". The second task of their system is to translate all the submitted material as well as the output material from the normal text into its corresponding lips of sign language and finger spelling. The topic of General Science for primary school has been applied to introduce the desired modules. Some selected experts have tried the concerned modules. View points of the mentioned experts have been considered to form the major conclusions. Many fields have been covered in evaluation process, mostly deal with the Software development technique and multimedia objects besides other standard criteria of special needs requirements. Joseph *et al.* [12] have identified a general limitation on printed text as a source of input for language acquisition. The printed material could only serve as a source of linguistic input to the extent that the learner was able to make use of phonological information in reading. Focusing on evidence from the acquisition of spoken language and literacy skills in deaf

individuals, which was not an adequate source of input for language acquisition in learners with limited phonological knowledge of a spoken language.

Mohammed *et al* [15] have proposed an e-Learning System (LS) which offers Arabic Sign Language (ArSL) in correspondence to the text in the learning environment. The system was designed ably for deaf adults for the purpose of their lifelong learning. In the LS, the special needs of deaf learners are satisfied, e.g. bilingual information (Arabic text and Arabic sign language), high level of visualization and interactive and explorative learning. The basic objective of their e-learning system was the support of the equal rights of deaf people for their access to the education and training. Also dictionaries between Arabic and Sign Language are important parts of learning. It was possible for Deaf to find words as a sign language. As the use of computers becomes more widespread, it has become more convenient to study using computer software and/or the Internet facilities.

Ruth *et al* [16] have proposed the current research priorities relating to deaf education and research outcomes that appear likely to have a significant impact on the development of educational practice. Practitioner priorities also are identified, and explanations for the gap between research and practice are analyzed. Ways in which the gaps between research and practice can be addressed are proposed. The goal was to provide a catalyst for broad-based discussions about how to include teachers in educational research planning and create genuine and effective partnerships between researchers and teachers to enhance educational outcomes for deaf pupils.

Velammal *et al* [17] have proposed the problem of information display in a non-visual Web interface. Access was made using the notion of context by assisting through the audio support and embodying their approach, by providing the standard features of a screen-reader along with browsing through voice browser. However, when a user follows a link, it captures the context of the link using a simple topic-boundary detection technique, and uses it to identify relevant information on the next page with the help of screen readers, and navigation was done through the voice browser. In order to aid the visually impaired users with a complete user friendly browsing approach they permit the content to be known by the screen-readers and voice browsers for the purpose of navigation.

II. PROPOSED METHODOLOGY:

The visual system and hearing can be justly considered as the dominant sensory modalities in humans for providing proper communication process. While considering the visually impaired as well as the hearing impaired person it's been difficult for communication for both the affected persons and also for the other people who does not understand the sign language. So it has become a necessary issue to develop a technique for communication for deaf as well as for blind learners. The research relating to these problems has become an interesting topic recently and different techniques have been proposed. In this paper we are proposing a design of an interactive learning tool for visually impaired learner to convert pictures to sound. Here we propose an information recognition framework which consists of digital camera and voice synthesizer using Speech Application Program Interface. Here we uses the method such as optical character recognition algorithm which is used to convert Image to text and From text to voice conversion so that the visually impaired learner can be able to understand what is available in the information. The proposed method will be socially useful for the differently abled learners.

REFERENCE:

- [1] KatjaStraetz, Andreas Kaibel, Vivian Raitchel, Marcus Specht, Klaudia Grote and Florian Kramer , "An e-Learning Environment for Deaf Adults", In.proc.of Conference 8th ERCIM Workshop "User Interfaces for All, 2004.
- [2] Iain Murray and Helen Armstrong ,"A Computing Education Vision for the Sight Impaired", In.Proc.of the Sixth Australasian Conference on Computing Education, Vol.30,pp.201-206,2004
- [3] A.S.Drigasand D.Kouremenos,"An e-Learning Management System for the Deaf people", WSEAS Transactions On Advances In Engineering Education, Issue 1, Vol. 2, pp.20-24,2005.
- [4] BenjapornSaksiri, William G. Ferrell and PintipRuenwongsa , "Virtual Sign Animated Pedagogic Agents To Support Computer Education For Deaf Learners", Accessibility and Computing, No.86,2006.
- [5] Teresa Chambel, Pedro Antunes, Carlos Duarte, Luis Carrico and NunoGuimaraes , " Teaching Human-Computer Interaction to Blind Students",HCI Educators, portugal,2007
- [6] S. Khwaldeh, N. Matar, and Z. Hunaiti , "Interactivity in Deaf Classroom Using Centralised E-learning System in Jordan",PGNet,2007.
- [7] Donal Fitzpatrick and Declan McMullen , "Distance Learning of Graphically Intensive Material for Visually Impaired Students",In.Proc.of the 11th international conference on Computers Helping People with Special Needs, pp. 219 – 225,2008.
- [8] NantanootSuwannawut , "Web 2.0 and the Visually Impaired Learners", In.proc.of workshop on the future of social networking, 2008.
- [9] Maha A. Al-Bayati and Karim Q. Hussein, "Effects of Tutorial e-Lessons for Hearing Impaired Persons on Motivation Towards Learning (General Science Topic as Case Study)", European Journal of Scientific Research, Vol.38 ,No.2,pp.189-198, 2009.
- [10] CemCuhadar, H.FerhanOdabas and Abdullah Kuzu , " m-Learning for Hearing Impaired Learners:Dimensions of Evaluation",International Journal Of Education And Information Technologies ,Vol.3, 2009.

- [11] Dr.Karim Q Hussein and Dr.Ayman Al-Nisour , "e-Learning Modules of Tutorial Lessons for The Deaf Students : Development & Evaluation view Points of Experts in Consideration", IJCSNS International Journal of Computer Science and Network Security, VOL.9 No.9,2009.
- [12] Joseph H. Bochner , "A limitation on reading as a source of linguistic input: Evidence from deaf learners", Reading in a Foreign Language October 2009, Volume 21, No. 2, pp. 143–158,2009.
- [13] Muttayya M. Koganuramath and Puttaraj A. Choukimath , "Learning Resource Centre for the Visually Impaired Students in the Universities to Foster Inclusive Education", ICAL, 2009.
- [14] Verena Stein, Robert Neßelrath and Jan Alexandersson , "Improving Spelling Skills For Blind Language Learners", In.proc.of Artificial intelligence,2010.
- [15] Mohammed Abo El-Soud , A.E. Hassan , M. S. Kandil and Samaa M. Shohieb , "A Proposed Web Based Framework E-Learning and Dictionary System for Deaf Arab Students", International Journal of Electrical & Computer Sciences IJECS-IJENS Vol. 10 No. 01,2010.
- [16] Ruth Swanwick and Marc Marschark , "Enhancing Education for Deaf Children: Research into Practice and Back Again", deafness & education international, Vol.12, No.4, pp.217–235 , 2010.
- [17] B.L.Velammal and P.AnandhaKumar , "Flexible Content Browsing for Impaired e-Learners", International Journal of Computer Applications, Vol.27, No.3, pp. 0975 –8887, 2011.
- [18] S.Asha and C.Chellappan , "Voice Activated E-Learning System for the Visually Impaired", International Journal of Computer Applications, Vol.14, No.7, pp.975–8887,2011.
- [19] Maria Roccaforte, Daniele Capuano, Elena Tomasuolo, Maria T. De Monte and Katherine M. Groves , "Strategies for Italian Deaf Learners", In.proc.of International conference on language learning, 2011 .