Learning Resource Centre for the Visually Impaired Students in the Universities to Foster Inclusive Education

Muttayya M. Koganuramath
University Librarian, Tata Institute of Social Sciences,
Deonar, Mumbai, India
kognuramath@rediffmail.com

Puttaraj A. Choukimath
Asst. Librarian, Tata Institute of Social Sciences
Deonar, Mumbai, India
choukimath@tiss.edu

Abstract
The Libraries need to be committed to ensure full access to their range of services and facilities to their user community. In this paper the views and concerns about achieving the goals of ‘inclusive education’ in the Indian higher education system through the computer and assistive technologies of a ‘Learning Resource Centre for the Visually Impaired Students’ is presented. With reference to the several reports of concerned ministries, organizations, and commissions, need and scope for providing disability information services to students, research scholars, faculty and staff with disabilities in the universities are discussed. It also emphasizes a successful case of “M. K. Tata Memorial Learning Centre for Visually Challenged Students” to illustrate how best the university library’s information resources and services could be extended to its disabled user community. It also enumerates the salient features, special services, special resources, assistive/adaptive technologies and futuristic plans of a state-of-the-art ‘Learning Resource Centre for the Visually Impaired Students’ to foster inclusive education.

Introduction
Ever since, the libraries have recognized their role in providing information resources to one and all they have also become leaders in accommodating individuals with disabilities within their physical spaces. Within the given facilities it is usually easy for a librarian to identify individuals with disabilities who need assistance. They come only when the library is open to the public and therefore staff is available to help. When a person arrives at the library using a wheelchair or a white cane, the librarian can sense what types of accommodation he might need in order to access specific library holdings. When a person who is blind uses speech output technology within a library but cannot access certain resources because of their inaccessible design, library staff can observe the patron’s difficulty and make themselves available to read screen content.

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. But today ICT has helped to reduce the digital divide between sighted and the blind by providing information on their desktop. ICT and its tools are highly flexible and provide great scope for usage by persons with vision impairment. Information available to the seeing world is now available to the persons with vision impairment. It is very evident that those who are computer literate are able to gain education, and empowerment as compared non-literate in technology. Still with all these technologies the visually impaired has been facing problems in accessing the information.

The National Concern
According to the Census 2001, there are 2.19 crore people with disabilities in India who constitute 2.13 per cent of the total population. This includes persons with visual, hearing, speech, locomotor and mental disabilities. And, 49 per cent of disabled population comprises the visually impaired persons.

Government of India, Ministry of Human Resource Development, Department of Education (2005) in its ‘Action Plan for Inclusive Education of Children and Youth with Disabilities’ has mentioned its goal as “Recognizing Education for All children as a fundamental right, to ensure the inclusion of children and youth with disabilities in all available mainstream educational settings, by providing them with a learning environment that is available, accessible, affordable and appropriate to help develop their learning and abilities.”

Academic Relevance
Establishment of the ‘Learning Resource Centre for the Visually Impaired Students’ will enable the blind
and low-vision students to access the library resources and services without any hindrance irrespective of their disciplines. Such a centre will provide easy, fast and timely access to the information resources and services of the library to all the visually challenged students, research scholars and faculty of the university/institute.

International Status
Developed countries like USA, Canada, UK and many European nations have started their initiatives to facilitate the persons with disabilities (PWD) much before. Most of the universities and institutes in these countries are providing access to information to the disabled persons by way of enacting the law, by formulating the national policies and funding the libraries and information centres. They have state-of-the-art technologies to assist in the information access. All such institutes have disabled person friendly infrastructure, information communication tools, facilities and services, trained man-power. The government departments, institutes, libraries, corporate houses, foundations and NGOs have disability friendly websites and portals.

Indian Scenario
India is not left far behind in empowering its disabled citizenry. It has provided all possible support to the persons with disabilities either by enacting a special Act, or by executing a ‘National Policy for Persons with Disabilities’, or by way of providing reservations in education, employment, government schemes and programmes or establishing institutes and organizations and many more. In addition to the legal framework, extensive infrastructure has been developed including the ‘National Institute of Visually Handicapped, Dehradun’. With this background, the Indian scenario seems to be much encouraging and supportive. A brief account of such initiatives and efforts is as follows:

**Persons with Disability (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995**
The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 has come into force since February 7, 1996. This law is an important landmark and is a significant step in the direction of ensuring equal opportunities for people with disabilities and their full participation in the nation building. The Act provides for both preventive and promotional aspects of rehabilitation like education, employment and vocational training, job reservation, research and manpower development, creation of barrier-free environment, rehabilitation of persons with disability, unemployment allowance for the disabled, special insurance scheme for the disabled employees and establishment of homes for persons with severe disability.

**Support of the University Grants Commission**
The University Grants Commission (UGC) is also supporting selected university departments and colleges of education in the country to offer special education, with financial assistance available under the programme of ‘Integrated Education for Disabled Children’ by the Ministry of Human Resource Development, Government of India. The UGC had started the scheme of assistance to universities/colleges to facilitate Teacher Preparation in Special Education (TEPSE) and Higher Education for Persons with Special Needs Differently-abled Persons (HEPSN).

**Advocacy from the National Knowledge Commission**
National Knowledge Commission in its report ‘RIGHT TO EDUCATION” has recommended that, “school education must be provided to all, which necessarily also requires that children of the disadvantaged, landless and minority communities must also be integrated, along with children with disabilities or special needs. This requires there should be no distinction made in terms of the type of schooling provided within the government system, for children from different social, economic and cultural backgrounds. The model bill has the potential of creating a parallel and discriminatory system of schooling which can result in stratification of the education system for children from disadvantaged communities and backgrounds, because it requires only provision of non-formal education in such cases, rather than mandating the provision of regular schooling. Obviously, in all cases, the school system should be flexible enough to cater to particular needs of students.”

**Institutional Initiatives**
The report of manpower development published by the Rehabilitation Council of India reveals that more than 1,00,000 teachers will be needed in the next ten years to cater to the educational needs of disabled children in schools. Bachelor’s and Master’s level teacher programmes are needed for preparing teachers to help disabled children realise the objective of education for all.

Under the aegis of Ministry of Social Justice & Empowerment, Government of India, National Institute for the Visually Handicapped (NIVH), Dehradun has been working for the welfare of visually impaired persons. It also houses the ‘National Library for the Print Disabled’.

IGNOU, New Delhi has established the National Centre for Disability Studies in November 2006 with the mission ‘to provide quality education at the doorsteps of the learners including persons with disabilities’. The specific mission of the centre is to strengthen the potentials of persons with disabilities and build their capacity which may help their mainstreaming in the society.
Many institutes and universities like University of Delhi, Jawaharlal Nehru University, Tata Institute of Social Sciences, St. Xavier College-Mumbai and others have established an ‘Information Centre for the Visually Challenged Students’. Therefore, it is evident that, across the country few universities and colleges have already succeeded in their initiatives to establish such a centre or unit for their visually impaired students, scholars and staff.

Significance
India is aspiring to be a developed nation by 2020. In the ‘India Vision 2020’ document education and ICT are the important aspects to achieve this. Higher education in India is at the dawn of complete reforms. The reports of National Knowledge Commission, Prof. Yash Pal Committee and Ministry of Human Resource development (Government of India) ‘Action Plan for Inclusive Education of Children and Youth with Disabilities’ reveal the role and importance of the persons with disabilities. India at large has to realise the potential of such disabled youth in general and visually impaired persons in particular.

At this juncture, this is very important to formulate a national policy and guidelines to establish the ‘Learning Resource Centre for the Visually Impaired Students’ in every university and institute. This will be a big leap towards fostering ‘inclusive education’ in the higher education system of the country. Thereby, the visually impaired students, research scholars, and faculty will be empowered by having access to their requisite information sources and services. Thus adds value to the Access Audit of the nation.

Purposes
The ‘Learning Resource Centre for the Visually Impaired Students’ is expected to serve the purposes as mentioned below:

a) To provide ‘Equity of Access’ to the visually impaired students;
b) Study room equipped with IT workstations;
c) Video Magnifying Systems;
d) Unlimited book fetch service to facilitate easy access to the collections;
e) Flexible borrowing facilities, including extended loan periods and increased borrowing allowances to suit individual needs;
f) Assistance with using the Library Catalogue and other electronic resources;
g) Book lockers, free of charge;
h) Photocopying and printing;
i) A personalized ‘Buddy Service’ which provides students to advise and assist with Library usage throughout their studies and research; and
j) Training in using the ‘Assistive Technologies’;
k) Physical accessibility to the collection and other service areas;
l) Brailing of Library materials;
m) Tactile signals;
n) Special purpose databases;
o) Catalogues of materials in alternative formats; and
p) Transportation, and many more.

Assistive Technologies
Blind and partially sighted students must access print resources in alternative forms. Although technology enables access, adapted materials such as audio textbooks are not readily available. Adaptive technology magnifies print or transforms it into audio or tactile forms, while speech synthesizers verbalize electronic resources.

The Technology may be able to help the blind in the workplace, classroom, or the management of their home. Standard personal computers can be modified using large print, speech, or Braille adaptations. Adapted computer systems can be used to send and receive electronic mail, browse web pages, compose documents, work with spreadsheets and databases, and much more. Closed Circuit Television systems can be used to enlarge every day print. The Technology for the Blind Program also provides adaptive devices such as talking and large-print calculators, Braille writers, four-track tape recorders, note-takers, and other specialized adaptive devices for use in the workplace.

World Wide Web Consortium (W3C) defines assistive technology as ‘Software or hardware that has been specifically designed to assist people with disabilities in carrying out daily activities.’ This definition is quite broad to accommodate the wide range of technologies available. However, it is evident that the focus of W3C is firmly on web and HTML because of the proportion
of information dedicated to making HTML accessible. Below is a brief account of widely used assistive technologies:

1. General Assistive Technology: General
   a. DAISY format readers: e.g. Victor Reader, Victor Reader Soft from VisuAide, LP Player from Labyrinten Data
   b. Text to MP3 Converters: e.g. TextAloud

2. Assistive Technology: Learning Disabilities
   a. Scanning, Reading and Writing Software: e.g. WYNN, Kurzweil 3000, Kurzweil 3000 for Mac, TextHelp
   b. Reading Software: e.g. CAST eReader

3. Assistive Technology: Blind/Low Vision
   a. Screen Reading Software: e.g. JAWS for Windows, Window-Eyes, CAST eReader, TextHelp
   b. Screen Magnification Software: e.g. Zoomtext, MAGic
   c. Web Access Software: e.g. Connect Outloud, IBM Home Page Reader
   d. Braille Notetakers, Embossers & Displays: e.g. FreedomScientific Power Braille and Braille’ n Speak, BrailleLite, Type’ n Speak, and Type Lite products; Pulse Data, BrailleNote and VoiceNote products
   e. Scanning, Reading and Writing Software: e.g. OPENBook, Kurzweil 1000
   f. Scanning and Reading Hardware: e.g. SARA

M. K. Tata Memorial Learning Centre for Visually Challenged Students
Sir Dorabji Tata Memorial Library, is one of the premier social science libraries in the world and is acclaimed by the people from India and abroad. Presently the library is in the process of expansion of library facilities by having digital library, cyber library and document delivery system for the Asian library users. To ensure equality of access to ICT for lifelong learning, to literature, and for the information needs for those with a disability, the library had submitted a proposal to M K Tata Trust in September, 2007 for the establishment of “M. K. Tata Memorial Learning Centre for Visually Challenged Students” at TISS Library. Development of M. K. Tata Memorial Learning Centre for Visually Challenged Students therefore bridges the gap between visually challenged and others and give an equal opportunity to access available information sources in the form of book, journal, online databases and electronic journals.

M. K. Tata Memorial Learning Centre has been setup at Sir Dorabji Tata Memorial Library, TISS in 2008 to provide innovative teaching techniques and philosophy that continues to have far-reaching effects on the lives of visually challenged and taking them to new heights of independence. M. K. Tata Trust, Mumbai has funded the project. Ms. Piloo Tata, Chairperson, M. K. Tata Trust was inaugurated the centre on 7th May, 2008 during the Institute Convocation function. The Centre has acquired latest technologies to assist visually impaired readers. For the first time, partially sighted people can now read for long periods of time without tiredness. It is a unique computer reading facility for visually impaired with a congenial classroom environment. The Centre is aimed to provide barrier free access and independent reading of library materials. The Centre believes that with proper training and opportunity, visually challenged people can compete on terms of equality with their sighted peers.

**Salient features of M K Tata Memorial Learning Centre**
Provision of the following facilities is critical to the quality of teaching and learning experiences in Computer training centres for the visually impaired.

- It provides independent reading of books/journals and library services
- It provides course curriculum in alternative format namely Braille, large print or soft copies on CDs.
- Congenial Classroom environment
- Opening hours:
  - 09:00 AM to 11:00 PM (Monday – Friday)
  - 09:00 AM to 08:00 PM (Saturdays)
  - 10:00 AM to 05:00 PM (Sunday & Holidays)
- Air-conditioned computer lab.
- Number of disabled users:
  - Post-Graduate Students: 20
  - Research Scholars: 1
  - Faculty: 1
  - Visitors and Walk-in users from other institutes, universities and NGOs are also welcome.
- Computer Training for Independent Access of Computers
- Independent reading of text books/ library services
- Provision of curriculum in alternative format namely Braille, large print or soft copies on floppies or CDs.
- Congenial Classroom environment
- Barrier free access to the disabled.

**Special Services**

a) **Computer Training for Independent Access of Computers:** Today the visually impaired, deaf, deaf blind and physically challenged can also learn
computers. JAWS software for the blind, which converts a normal PC into a talking PC, Magic Magnification software for low vision persons and speech recognition software like the Qpointer Hands free, modified keyboards, switches, pointing devices for physically handicapped and Converser FM assistive listening devices for deaf make it possible to train the disabled in computers. Knowing computers would also help them in their education as they can acquire an ocean of knowledge and information from the Internet.

b) Independent Text Reading: The blind and low vision students today are dependent on voluntarily readers and are able to barely manage to study their textbooks but due to acute shortage of human readers these days, the problems have multiplied. However, with the use of Text Reading machines, like the K1000 OCR reading software, which using a PC and scanner convert any printed text into sound and magnify the text for low vision on a Standard TV/monitor, or even provide support for reading, writing and studying for dyslexic [learning disabled] they can simply borrow any book from the library and read the same independently and Prisma print magnifier connected to a 21 inch TV or monitor for low vision.

c) Provision of curriculum in alternative format like Braille computer lessons: With the setting up of a high speed computerized mini Braille printer, they can get their lessons of their choice in Braille, even one copy, if so desired on demand as and when needed. They can also carry home notes or a few chapters of a textbook taken from the library duly converted into Braille for studying at their own pace at home. This facility can be extended not only to English language but one can also produce Braille text in Indian languages. Besides, one can also provide Braille print-outs not only in text but also charts, maps, diagrams, pictures incorporated along with the text.

State of the Art Library Services to the Visually Impaired Students

a) JAWS Pro Talking software: For conversion of a normal PC into a Talking PC to enable the blind to operate computers independently including Internet Access and also to train blind persons on using the computer.

b) Kurzweil 1000 OCR reading software: An excellent support for blind students to read any printed books from the library to have independent access to not only their text-books but also other general reading. It is used with a combination of a scanner and a PC.

c) Magic Magnification Software Pro: Useful for enlarging the screen from 2x to 16x enabling low vision students to view the monitor screen as well as use the add-on support tools for enhancing visibility.

d) Talking Typing Teacher Pro: Talking Typing tutorials specially designed for the blind with complete guidance & practice lessons for learning keyboarding skills & developing typing speed in a systematic manner. Since the program also has a complete display of all lessons, even the low vision students can read and learn to type.

e) Braille Scanning Software – OBR (Optical Braille Recognition): Optical Braille Recognition (OBR) is a Windows software program that allows you to ‘read’ single and double sided Braille documents on a standard A4 scanner. It scans the Braille document, analyses the dot pattern, and translates it into normal text that it presents on the computer screen.

f) Prisma Magnification Device for Low Vision: Prisma (Fig.1) is a full colour video magnifier with a stylish, adjustable camera stand and integral table that allows a tremendous range of magnification in a convenient size. The simple controls allow one to view in full colour or enhanced reading modes. Magnification is achieved by raising or lowering the camera and re-focussing.
with the large focus control located on the top. Prisma uses a standard TV for its display, so you can take it just anywhere. The clearance under the camera allows one to write easily and even perform hand tasks such as needlework or carving.

**Figure 1: Prism Magnification Device**

**Zoom-Ex Instant Text Reader:** Zoom-Ex (Fig.2) is a small portable device that uses the new generation Motion Sensor technology in combination with its proprietary Zoom Office software to make scanning and instant reading of text fast and easy. Place a book under the highly sensitive camera and start reading or listening instantly and that too with an Indian Accent Voice! And with every turn of a page, the camera takes a snapshot of the page automatically. It then converts these photographic images to readable text. A book of 200 pages is ready in 8 minutes! Now read it at your own pace for long hours.

**Figure 2: Zoom-Ex Instant Text Reader**

**Index Basic D Braille Embosser:** Index Basic D low cost, High Speed, Double sided Tractor Feed continuous sheet, new generation technology Braille embosser. Important features are: it produces 2 pages i.e. front and back at the same time; uses Tractor Feed paper which can be spiral bound using plastic wire making it very economical; does not require any special binding equipment; supplied with an acoustic cabinet. The acoustic cabinet is very important for reduction of noise level during printing as well as protection of the printer from heat and dust. It also enables collection of the paper in an orderly manner.

**Figure 3: Index Basic D Braille Embosser**

**i) Freedom Scientific’s SARA:** Freedom Scientific’s SARA™ (Scanning and Reading Appliance, Fig.4) is an affordable and easy-to-use solution for reading a wide variety of printed material including books, mail, newspapers, magazines, and so much more. SARA uses the latest in advanced optical character recognition technology to scan text and then read it aloud in crisp, clear speech. SARA automatically stores and remembers the contents of hundreds of thousands of scanned pages.

**Figure 4: SARA**

**Future Plans of the Centre**

Although, the special users are satisfied with the present infrastructure, facilities and services, the Library is set to update this Centre time to time. The future aspirations of the centre are:

- To facilitate access to all the library databases;
- To facilitate with the specially trained professionals;
- To make the Library website disabled-friendly;
- To facilitate the users with latest assistive technologies; and
- To develop special courseware.

**Conclusion**

The teaching, learning, research, and other academic advancement of the visually impaired students in India today has become very necessary and should be
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regarded as an integral part of the national development process. It is therefore important that learning materials like books, journals, databases and other relevant information sources should be made readily available for the use of them. So far, the visually impaired students have been deprived of most of the information sources in print format accessible to the normal students. Of course, such a situation makes much unsatisfactory making them, to an unacceptably high degree, dependent on normal people or escorts to read for them.

Establishment of ‘Learning Resource Centre for the Visually Impaired Students’ will benefit the visually impaired students in the universities and institutes across the country to have the same opportunities for education, research, training as well as employment as their sighted peers. It will empower them to take active part in the general cultural, and other societal roles. Consequently, the establishment of a exclusive and fully equipped ‘learning resource centre for the visually impaired students’ would be an important step forward in attaining ‘inclusive education’ and integration into society as a whole. With the practical experiences in setting-up of the “M. K. Tata Memorial Learning Centre for Visually Challenged Students” at TISS Library it is self-evident that, inclusive education is possible only by such an initiative at all the universities and institutes of higher education across the country.

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