

E-learning: Enabling the Differently Able People in India

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Abstract

With this paper we bring into light the advances in literacy of the physically and mentally challenged in India. The mode of spreading education synthesized here is primarily e-learning. E-learning or Electronic learning incorporates the use of interactive video conferencing, virtual classrooms, satellites and education channels on televisions in the remote and rural areas. The areas are usually scant in education infrastructure, classrooms, skilled teachers, electricity and communication with nearby developed cities. The developing countries are home to 80% of world's disabled population. Education comes as a ray of hope, as it opens door to knowledge, employment, independence and self-worth. The government's initiatives and the private organizations role in this movement are analyze, the outcomes and future prospects are studied and concluded.

Introduction

There are 400 million people [1] with varying physical or mental disability in Asia. Out of these, 250 million is in the age group of 13-35 years which is also the working group. Most of them are in rural areas with not more ten percent getting sustainable employment. Their growth is hampered at primary level only. Social stigmas, poverty and lack of self-motivation to grow and become self-dependent are other factors which hinder their progress.

Literacy is the ability to read and write. With advancements in technology on national basis, various programmes have been started for the promotion of education among people living in different parts of India. There are areas where there is unavailability of proper schooling facility for normal students, so taking. In the under developed areas, people are unable to take any governmental help and are least interested in taking benefits from it due to lack of awareness. The e-learning programmes like the ones started by the first Indian educational satellite EDUSAT [5], National Blind Association, Sarv Shiksha Abhiyan [6] etc are changing the lives of many and also generating employment in remote areas.

One of the present popular IT technologies is e-learning. It has grown as a tool to educate one and all. It supports the notion of education anytime, anywhere and for anyone. It is irrespective of the community, region and monetary capacity of the student. The regional governments are facilitating various non-government organizations to come forth and

spread literacy amongst the incapable masses. Evening schools, television channels, radio broadcasts are made. The people, who can use only one of their senses to communicate with others, are provided digital aid. This helps them in understanding the syllabus of any course they wish to study, and it is also available at any time of the day. The needs of a skilled trainer for the deaf and dumb are now altered with mobile messaging and chat systems.

India's is a federal government with 28 states and 7 union territories [2]. There are huge differences in the literacy rates in each state. As per NHFS-3 released on 11 Oct 2007 India as a whole has the literacy rate of 74.04% [3]. This varies acutely from north to south and east to west. The state of Kerala has the highest literacy rate equal to 93.03% [3] whereas the state of Bihar has 63.08% [3] literacy. This is also the effect of the respective government's initiative towards education.

The state governments in the southern states of India have facilitated development of the Information Technology and Communication sector in the country for the spread of education to remote areas as well as below poverty line families. The physically challenged have to face various problems to go to any institute for studies. Even if they go, poor infrastructures like lack of low floor buses, ramp to move the wheelchair, escalators etc hamper their movement. At school level, the availability of skilled teachers to understand individual kid's need is impractical. These special children still manage to attain education till high school. After this, 3% reservation is given to them by government in all government institutions. The seats are very few as compared to the need and these also are filled on the basis of quota system and their scores at high school level. E-learning has helped such students to attain literacy and become self proficient.

The disabled are benefited by the state governments too. Since there are huge state wise variations in the dialects, occupations and growth opportunities, the transfer of skilled teachers from one region to another is hampered by the language they use to communicate. India has officially 22 languages and nearly 415 [7] local languages spoken in different parts of the country. People from one region in the same state are unable to communicate with each other. This leads to development of one region only and no traversing of the knowledge takes place. Poor education, health care, recreation activities, housing and economic activities remain undeveloped.

2. Population statistics

India stands second in the world with a still growing 1.21 billion population. The youth brigade has crossed the count of 808 million. It has the largest population in the working age group. It can change the face of the country and world on a broader perspective. Fig.1 shows the graph of population crossing different age groups. It clearly defines that the number of youth in the total population of India is the most. So while taking any decision the government has to take every possible step to utilize this man force in the best possible way. This paved the way that the disable people of this age group should be given special importance so that they can complete their basic education. Education will not only open the doors for higher intellect but will make them more motivated and self-confident. This will further lead to self-dependency in the profession that they opt for. So rather than becoming a burden to their family, friends or society they live a happy

prosperous life and contribute in the development of society and country.

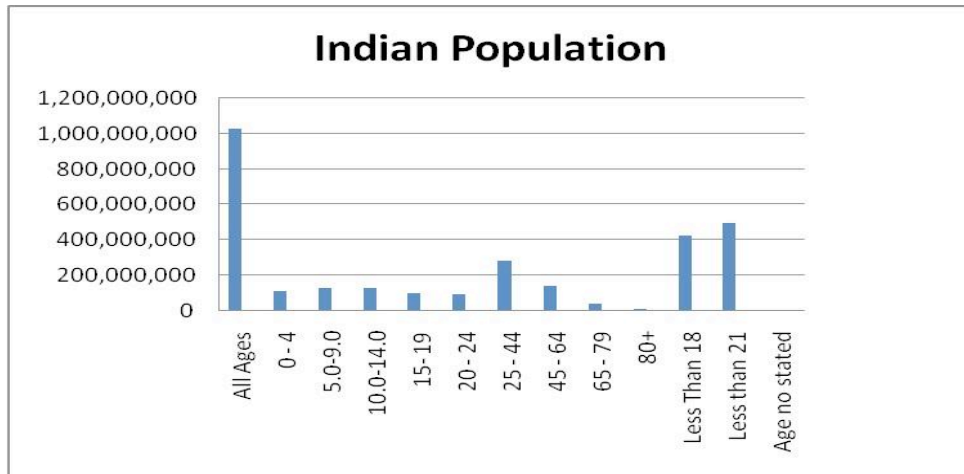


Fig1: Distribution of Overall Population in India

3. Distribution of disability

The South Asian countries are all developing and share common political, geographical and development perspectives. They all face similar growth and developmental problems. They all have large populations, slow development rate, brain drain, poor health facilities and a huge range of natural calamities. Many of the disabled are from birth; some get certain ailment at an age and acquire disability at that age. Many accident and calamity situations also generate physical or mental ailments. [9][10] Figure 2 shows the total population and population with physical or mental disabilities on a scale. It points towards the fact that India and Bangladesh have the most disabled people.

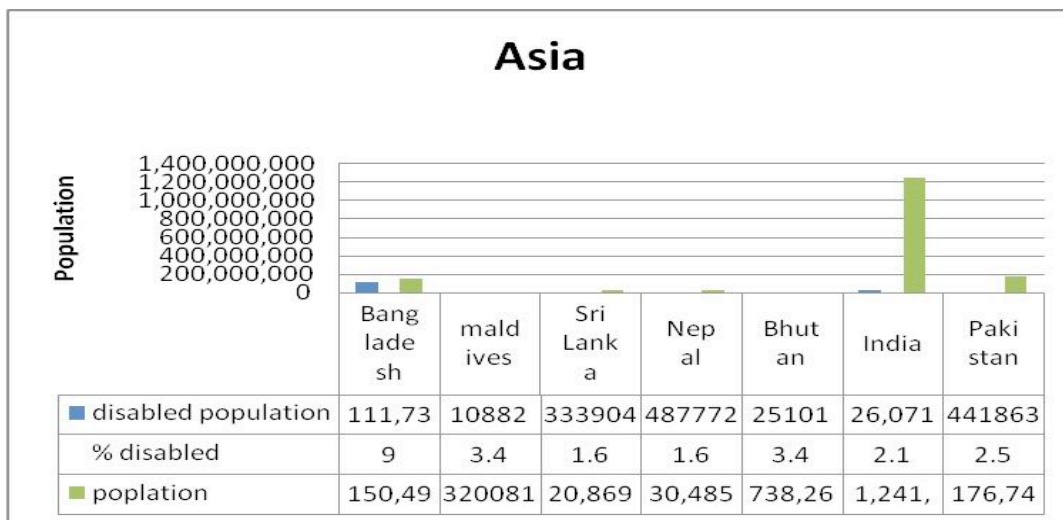


Fig 2: Comparison of Disabled people in Asia with Overall Population

A graph in figure 3 shows the percentage of people in distinct age groups facing single or multiple physical or mental disability.

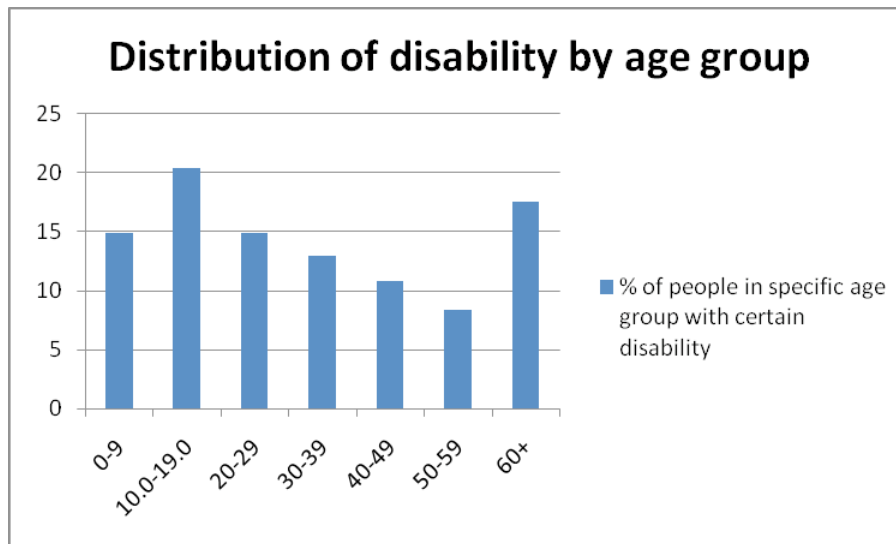


Fig 3: Distribution of Disabled people in India

Working age group has the highest population facing certain ailment. The elderly comprise more than 15% of the unprivileged population. They need physical/mental as well as emotional support to feel self worth. The senior citizens have a steep literacy rate, they do not contribute in the community's development.[11] They require care-takers. Along with one disabled person, more than one person is being affected. However, the working group comprises of people, who are in charge of their family's monetary situations. They are the earning source for their families and face quantum problems in even applying for a job. There is 3% reservations for such people in government jobs. 1% each for people with visual problem, hearing or speech impairment, autism, cerebral palsy and mental illness. [12]

Figure 4 demonstrates the division on the basis of various ailments in rural and urban India. The graph in the long run, helps to understand the attainment of jobs by such differently abled people in the country.[13,14] It shows that most of the population has locomotion problems, hearing or vision related ailments. The people who can move only with external support, are not able to attend schools and colleges as the required ramps are unavailable. They are trained in specialized schools. They can learn by sitting at one place. If computers are provided to them, and web based seminars are conducted, they can get exposure to other cities and countries. They can themselves become tutors to others like using these technologies. The people with mental illness and retardation are considered specially because each of them have an individual, different problem and manner of responding. Their schools are adopting e-technology, here they are using virtual classrooms and animations to make it more student friendly and entertaining. Narayan seva sansthan, is an NGO in Udaipur, Rajasthan (the largest state of India). It provides financial aid to disabled people for medicine and operation purposes. Mother Teresa Home in Jaipur is also providing food, shelter and medical facilities to such people. They are also educating them.

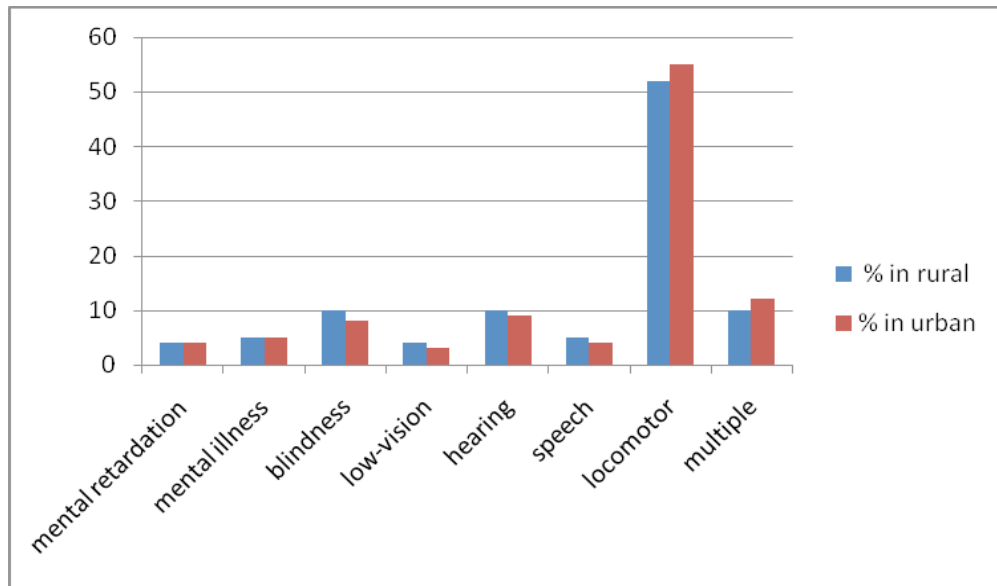


Fig 4: Different types of Disability in Rural and Urban Population

Figure 5 shows distribution by type of disability amongst the population of differently abled people. The visual impairment is the biggest problem faced. India Legal blindness is defined as visual acuity of not greater than 20/200 in the better eye with best correction or a visual field of less than 20 degrees [15, 16]. Legal blindness can mean tunnel vision, no central vision, cloudy or extremely blurred vision, seeing just shadows, or no vision at all. For this purpose, National Blind Association is doing significant work in Valsad Gujarat. It has established labs for the blind in 2002. Here the visually impaired people are first trained to use the computer systems using braille technique. After this, these people work on small projects. One such project is to convert huge collections of data, books, magazines and other readable matter into hearable format. This helps other blind people to access the huge e-library over the internet.[17]

3. Education statistics of the disabled people

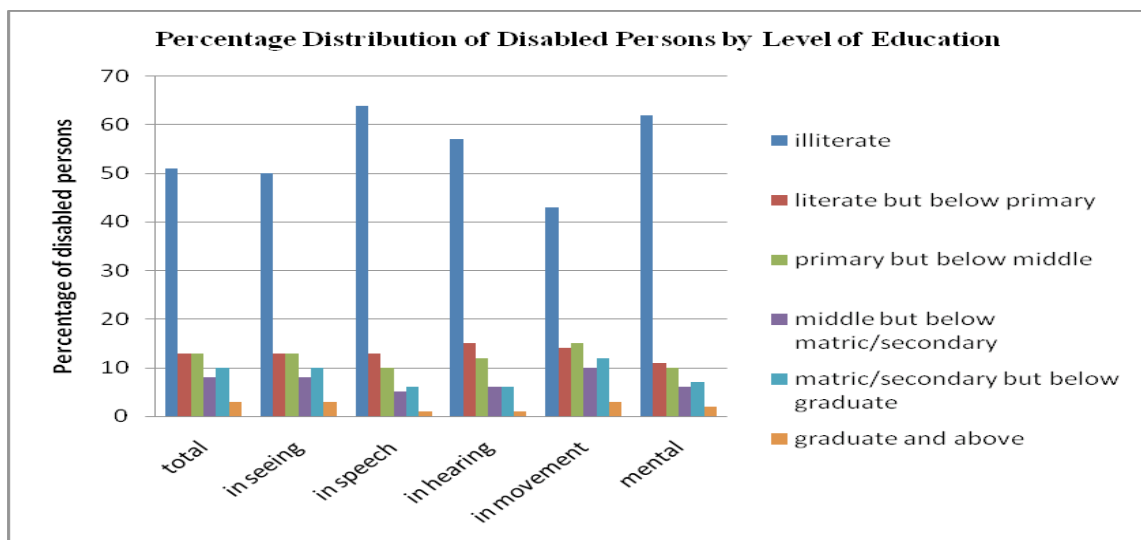


Fig 5: Percentage Distribution of Disabled Persons by Level of Education

The figure shows a graph of the variations in the education level on the basis of disability. The above graph points towards a high illiteracy rate amongst this population. The individual level of education attained by each group is shown in a two-dimensional manner. Each group with individual percentage of different education level can be monitored. Though the average literacy is 50%, variations can be seen in the education of locomotive troubles facing people and speech disabled people. The earlier group has 58% literacy. A very few are graduates. All other attained education only below matriculate. 35% of them has education below matriculation. Nearly 3% are graduates. 37% of the people with speech ailments are literate. Majority of them attended school below primary level and a scarce number are graduates. 39% of the mentally disabled people are literate. They show varying numbers at different levels of education. People with hearing disability, had education not above middle school. 50% blinds are literate. They show the highest number of graduates. On an average, they have completed secondary schools.

In 2001, only 38% females and 57% males were reported to be literate. Most of them have education till primary classes (11%). 9% have education up till middle classes. Merely 2% are graduates. This indicates a poor level of technical or vocational education. The number of completely disabled people is larger than partially disabled. Their recruitment agencies and colleges also give preference to partially disabled people. By this level of education, government or private jobs are unattainable. [18, 19] In the past 11 years, there is significant change in the level of awareness and resources available to such people.

4. E-education for the disabled

4.1 Technology for the Blind

EDUSAT is India's first satellite dedicated towards the spread of education in remote areas. It is a geo-synchronous satellite and provides relay of educational channels on television throughout the day. It has 5 ku beams. Southern, northern, eastern, north-eastern and western beam. Presently it is providing coaching to 50 universities covered by these 5 beams. It enables video conferencing and online seminars too. Through video conferencing, classroom coaching is provided. The students must attend the class to reciprocate the tutor's coaching. It also provides soft copies of books, videos, audios etc. [39, 40, 41]

The most innovative mode of teaching provided by EDUSAT is the network for blind schools. At Ahmadabad Gujarat, Blind People's Association has set up blind schools. EDUSAT is delivering live audio and data which is read by a blind person through its printed impression. It provides education from 1st to 10th standard. It has also setup a Braille Language Lab. Over 2,000 students in 10 schools across Gujarat are being taught mathematics, science, social science and Hindi for their board examinations. ISRO is planning to extend the project to other states.

4.2 JAWS

Job Access with Speech is computer software. It speaks out all the matter written on the computer screen. It enables a blind person to work on Microsoft word, access internet etc.

4.3 Daisy Forum of India

It is an NGO involved in the production of books and reading materials for people unable

to read the normal print. They help the disabled to attain books and other material in accessible format. The alternative methods to print are Braille, Talking Books, E-Text and Large Print. With the computerization of the Braille, production has been accepted method in all parts of the world. The Talking Books convert analog data into digital data and provides talking books which are recorded using computers and saved into CDs.

E-text helps in reading the computer screen for persons with blindness or print disabilities. The electronic text can be enlarged on a computer in e-text has made large print production easier than ever before.

4.4 Technology for deaf

National Association for deaf is an NGO with nearly 2500 members from across the country. It organizes coaching classes for them and also organizes meetings at national level. [42, 43]

Deaf Child India is a project by Nambikkai Foundation. It provides information technology training and access to deaf children in the state of Tamil Nadu. They develop text-books and other learning material which can be used by the deaf people.

4.5 Technology for autism [44]

Centre for Development of Advanced Computing (C-DAC) [45] is developing tools to facilitate learning for such specially gifted children. It involves multimedia and colorful presentations to involve students in such computer games. These tools access the student's progress and customizes the methods to suit the student's needs.

5. E-learning initiatives by government, corporate and NGOs:

There are a number of ventures in the field of educating the unprivileged people in remote areas of India by the use of electronic medium and technologies. There are certain state wise programmes initiated for it. Some of these are ERNET, GYAN-DARSHAN, IGNOU Doordarshan Telecast, INFLIBNET, Talking Kiosks etc.[20,21,22,23,24,25,26,27,28]

5.1 Gramjyoti

Ericsson has set up broadband network across 18 villages and 15 towns of the state Tamil Nadu. Its aim is to facilitate education using high speed internet bandwidth across villages. Community centers equipped with PCs and 3G mobile handsets and also provided teachers at their Chennai office to deliver education through internet. [29, 30]

5.2 Gyandoot

It is started by the Government of Madhya Pradesh. Here intranet facilities have been set up to connect the rural cyber cafes. It has set up 32 kiosks in high schools and higher secondary schools of Dhar District. Through these, the students are taught the courses of class X & XII. The students can share data and the question bank created by the experts. [31, 32]

5.3 Byrraju Foundation

The initiative is IBM Kid Smart Early Learning Programme. In the year 2004, Byrraju Foundation partnered with IBM India and deployed the technology to 142 villages of rural Andhra Pradesh. It spanned across six districts of Guntur, Ranga Reddy, East & West Godavari, Hyderabad and Krishna. [33, 34]

5.4 AKSHYA, Kerala

Project AKSHYA was launched in 2002 by Government of Kerala. It promotes basic computer usage among rural masses. The project aimed to establish 5000 multi-purpose AKSHYA e-centers across Kerala which are run by private entrepreneurs. [35, 36]

5.5 AAROHI, Uttaranchal

The project is started by Uttaranchal Government in partnership with Microsoft, Intel to provide basic computer education to all Government and Government aided schools from Class VI – XII. 1206 Government and 281 aided schools are covered. Microsoft further plans to enhance computer literacy in the states of Kerala and Uttaranchal by imparting computer education to 80,000 teachers and 35 lacks students. [37, 38]

6. Work of authors

Mrs. Gayatri Gupta, a Senior Teacher in government school in India, has served for 21 years in rural as well as the urban schools of Rajasthan. She is very well acquainted with the problems and governmental aids provided to such people. The basic level and standard of education provided to the people with special needs is unsatisfactory. There are very less specialized schools in India which provides a quality education to disabled students. She has researched about the different specialized schools in Jaipur, Rajasthan and the status of literacy level of such students at primary level.

Dr. Shakuntala Garg, an Associate Professor in government college, with an experience of 28 years, got all the statistics regarding the disabled student's literacy records of 2001-2011. The government schemes, funds and reservations provided at college level are not at par with the bulk disabled population. She rigorously researched about the different government and non government organizations aided schemes for the education of rural, women and differently able people.

Rahul Gupta is senior undergraduate student pursuing Bachelor of Engineering (BE) at MIT Manipal, India. As his specialization is in Information Technology, he had the vigor to accumulate information about the varied e-learning modes used in India for the advancement of the less developed masses. These masses comprise the rural India, below poverty line families and the disabled people in rural and urban areas. He has published 22 research papers and is working with more than 5 NGO's to create awareness about science in the young children.

Nidhi Garg is senior undergraduate student at JNU, Jaipur, India. She is pursuing Engineering in Computer Science and has visited different specialized schools in the state and gathered data about on how much electronic education is aiding the literacy of the disabled people. The results showed that the government's attempt to provide education through computers and internet is not reaching the masses and a lot of improvement is needed in the infrastructure.

7. Present and Future Prospects

The virtual classrooms, web seminars and video conferencing are successfully implemented in more than thousands of schools and local areas in the country. Currently, e-learning is being used to teach the people living in remote areas of India. Various IT companies are coming forward and starting with e-learning programmes too. They have introduced technologies to help the unable people communicate properly using various electronic devices.

Haptic interfaces [46] in computer devices, which involve non-verbal communication using touch help the blind and people who sense by touching to operate a computer device are introduced. Numerous keyboard shortcuts, hotkeys and compatible screen readers are available to make human computer interface easy for such people. In the future, these technologies appear to boom and become accessible by more number of people.

The government of India has passed two bills i.e. Rehabilitation Council of India Bill and the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act. These in collaboration with government and non-government agencies are providing resources and other amenities for the education of such people.

8. Conclusion

E-learning is touching lives of millions of Indians, transforming the outlook of the variedly challenged people in a developing country. Those regions which are inaccessible by vehicles are now getting directions through online seminars on first-aid, general mathematics and also, information on the onset of any disaster.

The population is grand; the present work appears to be a drop of water in the sea. The government's attempts are in accordance with the state governments, a lot time is wasted in collaborations and other formalities. A centralized attempt is needed. Foreign aid along with multi-national companies is trying to provide resources to the backward areas in our country. Surprisingly, the attempts made by the national and local governments lag behind and are incompetent with them. Even if proper education is provided to the disabled people using technology, two way developments will foster. One is the individual will become self-sufficient and second less dependency on someone else for their basic needs will decrease. It will not only enhance their lives, but the country as a whole.

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