Importance of Higher Education in Disability Sector for Differently Able Empowerment

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Abstract—*As per 2011 census there are 2.68 crore differently abled persons in the country. Assistive devices and equipments can significantly help persons with disabilities to become independent in daily activities. There are many eminent technical educational institutions in India and many are conducting research works for the development of assistive technology for the differently abled. So an extensive search was conducted to explore the assistive technology related projects undertaken in India. Out of 137 studies retrieved 34 met the inclusion criteria. The result shows that many researches are being carried out for the development of assistive technology in India. Many of the products are in the prototype stage or in the feasibility stage. It emphasises the need for extensive field testing and commercial production of the assistive technologies. Such initiatives will lead to differently abled empowerment. The authors put forward some suggestions in this regard.*

Keywords: *Assistive Technology, Disability, Differently Abled, India, Technical Education.*

1. INTRODUCTION

As per 2011 census there are 2.68 crore differently abled persons in the country. Genetic, birth injuries, infections, accidents etc. are some of the causes of the disabilities. A major portion of the differently abled are socioeconomically poor. Locomotor Disabilities (disabilities which leads to difficulties in movement) are one of the most common type of disabilities seen [1].

Assistive devices and equipments can significantly help persons with disabilities to become independent in their daily activities. The International Classification of Functioning, Disability and Health (ICF) defines assistive products and technology as any product, instrument, equipment or technology adapted or specially designed for improving the functioning of a person with a disability[2].International Organization for Standardization (ISO) defines assistive products more broadly as any product, especially produced or generally available, that is used by or for persons with disability: for participation; to protect, support, train, measure or substitute for body functions/structures and activities; or to prevent impairments, activity limitations or participation restrictions. This includes devices, equipment, instruments and software [3]. It is evident that currently available assistive technology offers many opportunities for students with disabilities to overcome the barriers to inclusivity, reach their full potential and share their contribution towards the national welfare [4].For many differently abled children, assistive technology represents the difference between enjoying their rights or being deprived of them [5].The disabled person also gains confidence and courage as they gain control over the machine. Gaining control over the machine helps them to gain control over their life [6].Studies has shown that powered mobility through devices like electric wheelchair provides disabled individuals with an energy efficient mobility system that increases their ability to work, to take care of themselves, and engage in leisure and social activities independently. But provision of inappropriate mobility devices can lead to adverse events such as low back pain and pressure sores, badly affecting their physical functioning, safety and quality of life [7].

Recognizing its importance, the Convention on the Rights of Persons with Disabilities (CRPD) urges government to ensure the provision of affordable assistive technologies and related services in several of its articles [8]. Also Article 23, of the Convention on the Rights of the Child (CRC) specifically recognizes the right of children with disabilities to special care and assistance, which should be provided free of charge whenever possible. Assistance should be designed to ensure that children with disabilities have effective access to and receive education, training, healthcare services, rehabilitation services, preparation for employment, and recreation opportunities in order for them to achieve their fullest possible social integration and individual development [9].Products generated should be adjustable, lightweight, durable, user- friendly, and of low maintenance. Cost of the equipments and custom modifications needed on individual basis restricts the access to such devices and equipments to a large segment of these fellow citizens.

There are a total of 23 Indian Institutes of Technology (IIT) in various parts of the country which are excellent centres of technical education [10]. Along with it there are 31 National Institutes of Technology (NIT) in India [11]. Besides, 24 Indian Institutes of Information Technology (IIIT) are producing highly skilled software engineers for the country [12]. It is complemented by around 3300 engineering colleges located in various parts of the country. It is estimated that around 1.5 million engineers graduate every year in India [13]. This reflects the volume of technically educated human resource in India.

Department of Empowerment of Persons with Disabilities (Divyangjan) under Ministry of Social Justice and Empowerment is co-ordinating activities in the disability sector in the county. There are 8 National Institutes working for the prevention and rehabilitation of various disabilities as follows;

1. National Institute for the Empowerment of Persons with Visual Disabilities (NIEPVD), Dehradun.

2. Ali Yavar Jung National Institute of Speech and Hearing Disabilities (AYJNISHD), Mumbai.

3. National Institute for the Empowerment of Persons with Intellectual Disabilities (NIEPID), Secunderabad.

4. National Institute for Empowerment of Persons with Multiple Disabilities (NIEPMD), Chennai.

5. Pt. Deendayal Upadhyaya National Institute for Persons with Physical Disabilities (PDUNIPPD), Delhi.

6. Swami Vivekanand National Institute of the Rehabilitation Training and Research (SVNIRTAR), Cuttack.

7. National Institute for Locomotor Disabilities (NILD), Kolkata.

8. Institute of Sign Language, Research & Training Centre (ISLRTC) Delhi.

Apart from that here are 13 Regional Centres/Regional Chapters of the National Institutes functioning in various part of the country. Fourteen Composite Regional Centres (CRC) for Persons with Disabilities are also established in various parts of the country to enhance the accessibility to persons with various disabilities [14].

Beside the Central Government institutes there are many reputed State government/Private owned rehabilitation institutes and institutions providing long term HRD courses in Physiotherapy, Occupational Therapy, Prosthetics & Orthotics etc.

Currently the eminent technical education institutions and institutions working and providing training in the disability sector in India are functioning as separate compartments. Active involvement and collaborative research works of technical education institutions and rehabilitation institutes will be mutually beneficial as well as a blessing for the millions of differently abled citizens of the country. Hence, we decided to explore the possibilities of such an integration and to understand the current status of technical education institutional activities in India in the disability sector.

2. METHOD

Extensive internet based search was conducted in online databases like Pubmed, Google scholar as well as in Google with interchangeably using the key words; Disability, Disabled, India, Devices, Technology, Assistive Technology, Institutions, Engineering, Academic, Technical, Project, Research, Persons with Disability, Empowerment.

3. RESULT

The search retrieved 137 articles. The authors individually verified the articles and 34 articles met the inclusion criteria and were included in this review. Many research works were conducted for the development of assistive technology for the differently abled in the Indian context. But many of the studies are in the prototype stage or have only undergone feasibility studies. Large stage field trials and commercial production is not been conducted. The relevant studies are selected for discussion.

4. CONCLUSION AND SUGGESTIONS

If a segment of the technical education students is up taking research works in the disability sector, it will produce significant and productive changes. The vibrant and creative skills of the young engineers/engineering students should be effectively channelized for the betterment of lives of differently abled. More opportunities should be arranged for field testing of the developed assistive technologies for the differently abled. The authorities, faculty and students should take active initiatives for such a change to happen in near future. We suggest that NIIUD should be functioning as the nodal agency for the following recommended functions;

1) The nodal agency must co-ordinate research, development, and evaluation of innovative technologies and strategies, so new or improved products, devices, and technologies are integrated into rehabilitation services in clinical or community settings.

2) The agency should communicate with the various stakeholders involved like central government, state government, persons with disabilities, caretakers of persons with disabilities, NGO's, Academic and research institutions etc.

3) The agency should formulate relevant policies, guidelines, and standards for successful integration and collaboration between the various stakeholders for the mission.

4) The agency should arrange provisions and support for prototype testing, feasibility studies, knowledge transfer, knowledge translation and commercial production.

5) The agency should assure accessibility and awareness of persons with disabilities and relevant stakeholders regarding the new and effective technologies available for their empowerment.

6) The agency should liaison with international institutions and organizations for collaborative research works for creating technologies and devices of mutual interest which is beneficial for differently abled persons in the country.

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