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Understanding the Role of Assistive Technology in Improving the Quality of Life for Persons with Intellectual Disability

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ABSTRACT

According to the recent data released by Census, 2011 on the disabled population in India, the percentage of PWDs stands at 2.21 percent to the total Indian population, with 2.41 percent as males and 2.01 percent as females. Persons with intellectual disability traditionally known as persons with mental retardation are characterized by significant limitations in intellectual functioning and adaptive behavior and their population currently stands at 1,505, 624 (Census data, 2011). They demonstrate various problem behaviors and lack of adaptive behavior skills which impair their integration in normal living and hinder their full participation in society. Assistive devices can be of immense help to these people, by reducing their dependence on others for self care, promote increased participation in various facets of life like education, work and social living, thus enabling them to lead dignified lives and in the process become efficient and contributive members of the society leading to full inclusion.

KEYWORDS Persons with Intellectual Disability (PWID), Assistive Technology (AT), inclusion

Introduction

Persons with disabilities face extreme isolation, exclusion and daunting challenges like social stigma, lack of opportunities for employment, and are subjected to various barriers for the enjoyment of . Persons with intellectual disability are those having "significant limitations in intellectual functioning and adaptive behavior. It manifests itself before the age of 18 years-AAIDD." They exhibit difficulties in performing activities of daily living such as eating, dressing, grooming and self care apart from display of impaired and inappropriate social behaviors. Deficits in cognitive functioning and learning styles characteristic of individuals with mental retardation include poor memory, slow learning rates, attention problems, difficulty generalizing what they have learned, inability to organize their time and lack of motivation. They demonstrate behavioral characteristics like learned helplessness, prompt dependency and fear of failure. Some also experience difficulty in communication and have fine and gross motor problems. They may need a range of support services ranging from intermittent to pervasive, depending on the severity of the condition- mild, moderate, severe and profound levels of mental retardation. Problem behaviors like temper tantrums, fears, and self injurious behaviors are also commonly seen (Baroff, 1999).

A new category of mental retardation was introduced at Census 2011, till 2001, it was included under the broader category of mental disability. Intellectual disability is defined as sub normality of intelligence due to arrested or incomplete development of the mind according to the Persons with Disabilities Act, 1995.

Assistive Technology

Assistive technology or AT is used as an umbrella term for both assistive products and related services. It is defined as "*any item, piece of equipment, or product system which may be bought off the shelf, or modified according to individual needs and that is used to increase, maintain or improve functional capabilities of individuals with disabilities*." - IDEA, (cited in Kelker, 1997). Assistive technology is redefining possibilities for the disabled, by enabling them to be more confident, independent and productive. By facilitating participation and inclusion of PWDs in all facets of life, it can impact self image, self esteem and sense of self worth (Scherer & Glueckauf, 2005).

Assistive devices can range from low tech (pencil grips, splints), no tech (walking stick) to high tech (computers with voice synthesizers and screen readers). These can be simple homemade devices to highly sophisticated devices which can control environments. It can be adapted toys, adaptive clothing, computers with specialized software, powered mobility, augmentative communication devices, specially designed switches, even as simple as mind maps and highlighted notes which will assist an individual with working, learning and interacting socially.

Assistive services are defined as "*any service that directly assists an individual with disability in the selection, acquisition or use of an assistive technology device*" -IDEA. The services include: evaluation of technology needs of an individual, purchasing, leasing of devices, selecting, designing, fitting, customizing and adapting of the devices, coordinating the use of other therapies, training in the handling and maintenance of the devices, technical assistance for professionals.

Figure-1: Assistive Technology: An umbrella term

Assistive devices often act as a missing link in the chain of pre-requisites that enable PWDs to lead a life with dignity and freedom, where they can exercise their choice and enjoy their rights. Assistive devices can help in the following ways:

Category of Disability	Assistive Devices
Mobility	Mobility devices: Wheelchairs (manual, electronic), walking frame, crutches, orthotic and prosthetic devices, Supportive seating: CP chair, supportive seat, standing frames, corner chair For aiding in daily living: adaptive cutlery, adaptive cooking utensils
Vision	Orientation and mobility: white cane, GPS enabled navigation systems, Reading and Writing : Braille, screen reader, daisy book player, audio formats, eyeglasses, magnifiers, taking calculators and watches
Hearing	Alerting devices: flashing doorbell, vibrating alarm Hearing devices: hearing aid, headphone, loop induction system, amplification devices
Communication	AAC devices: communication boards, quick talker, symbols or pictures Voice generating systems: TTS
Cognition	Task lists, visual and picture based schedules, timers and automatic reminders, touch screens, adapted toys and games

Source: adapted from 'Examples of Assistive Technology' from a Discussion Paper on AT for CWD, UNICEF, 2015

When the assistive devices are appropriate to the users' environment and needs, assistive technology is a powerful tool to increase independence and improve participation. It provides the means of access to and participation in educational, social and recreational opportunities. This technology helps persons with disabilities perform actions which they could not do before increasing self dependence and benefits in areas like health, education and information access. Recognizing the need and importance of assistive technologies for PWDs, Convention on Rights of PWDs (CRPD) (as cited in UNICEF, discussion paper, 2015).

Benefits of using Assistive Technology for Persons with Disability

- AT is one of the key elements to promote full inclusion of PWDs in mainstream society
- it acts a s precondition for PWDs to achieve equal opportunities and full participation
- affordable and easily available AT helps PWDs to be self dependent and raises self esteem
- appropriate AT will help PWDs to improve their functioning and thus become contributive and productive members of the society

Role of AT for ID

Assistive Technology in the area of Education:

Assistive technology acts as one of the key components to improve access to educational services for children with intellectual disability through the use of computers having word prediction software, word processors and other software tools like concept mapping. Specialized software like 'Clicker 6' having special multimedia modules consisting of graphics; animations and text to help children with intellectual disability learn functional academics. Many children have fine motor problems so they can use assistive devices like pencil grips to write. They also need assistive devices like toys and blocks for learning concepts in a concrete manner.

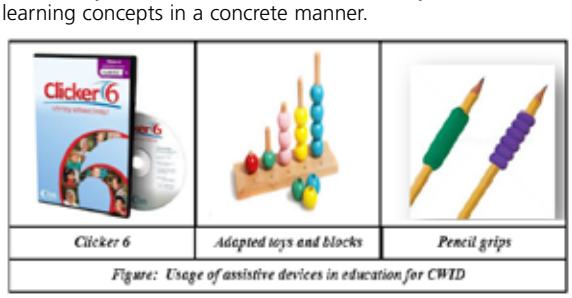


Figure: Usage of assistive devices in education for CWID

Assistive Technology in the area of Daily Living Skills

AT in Dressing: Affordable assistive technology based solutions are available for children with intellectual disability to perform tasks of daily living such as dressing. PWID often face challenges in performing basic activities like buttoning and unbuttoning while dressing. Assistive technology makes life easier by providing the use of adaptive clothing such as ***velcro based dressing***. Materials-shirts, pants, gowns etc. even shoes having velcro can be used instead of lace based shoes, as they fasten easily and are hassle free.

Figure: adaptive clothing (shirts, pants, shoes, dresses)

AT in Grooming: Assistive technology includes devices, services and products which will improve the functioning of persons with disabilities. It will be instrumental for their participation in various facets of life. It is seen that PWID, face difficulty in grooming like combing of hair, wearing social situation appropriate clothing, resulting in their social exclusion and hinder their effective participation in society on an equal basis with others (Convention on Rights of PWD, 2006).

- Flash Cards illustrating the use of appropriate social occasion based clothing
- Techniques like chaining and model of plaited hair, to teach plaiting of hair

AT in Eating: Some PWID, especially those with severe impairments face difficulty in performance of daily living tasks like eating, without spilling. Assistive technology will help to reduce the impact of the disability and help PWID to cope with the situation, by the use of adapted cutlery like adapted cups/mugs, plates.

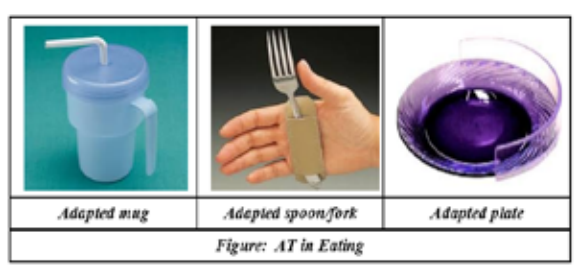


Figure: AT in Eating

AT in Self Care and Hygiene: PWID are often seen to have a disregard for self care due to lack of inferential learning from surroundings and by observation of others, in their surroundings. They need to be taught the skills of having bath daily, wearing clean clothes, clipping nails, oiling hair and thus presenting a neat, well groomed appearance and empowering PWID with greater physical and mental function and improved self esteem.

Role of Assistive Devices in Employment: According to the proceedings from the 15th International Conference on computers helping people with disabilities (2016), assistive devices should help to improve the quality of life of these people, and maintain their sense of independence in the workplace by improving their skills and secure productive employment. Examples of assistive devices in sheltered workplace are:

- Devices that help and supporting while performing cutting operations in different materials, for example: wood, foam, etc.

- Devices that support sketching, hatching and writing or typing tasks
- Devices that support drilling, turning, milling and engraving
- Devices that enable persons with disabilities to access, interact with and use computers at home, work or school
- Devices designed to reduce the probability of repetitive stress associated with work related situations and devices to manage and organize time like timers, visual calendars

Timers | Visual schedule | Visual Calendar

Figure: AT in employment for PWID

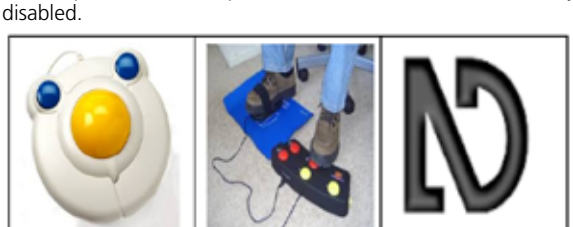
AT in Communication: Communication is a means of sharing ideas, thoughts and feelings. Man being a social animal needs to communicate and language is a vehicle of communication. However PWID often lack the ability to communicate as they may have speech problems or lack of ability to use situation and context appropriate language due to deficits in cognitive functioning. Assistive technology helps PWID to communicate effectively through the use of

Communication cards | Communication file

Figure: AT in Communication

Augmentative and alternative communication devices such as communication boards, communication cards.

AT in information and computer access: Persons with intellectual disability can access computer based information through the use of assistive devices such as touch screen, adapted input devices like adapted keyboards and mouse for PWIDs having fine motor problems which restricts computer usage. Use of voice synthesizing software such as text-to-speech (TTS) or screen- reading software, on screen keyboard, also helps to make computers accessible for the intellectually disabled.



Adapted mouse | Foot pedal mouse | Logo of NVDA (TTS)

Figure: AT and computer access

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