

Assistive Technology and Environmental Modifications to Enhance Abilities and Function

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Modern Technology in varying levels of sophistication can be utilized to assist and enhance human functioning in day-to-day tasks. The essence of a truly egalitarian society lies in its inclusivity, and the recent advances in technology, are not just making life easier for the able bodied, but are also providing crucial assistance for persons with varying level of disabilities to enhance their function at individual level and constructive participation at the community level.

Assistive products and technology refer to an umbrella term for both assistive products/devices and related services: instrument, equipment, or technology adapted or especially designed for improving the functioning of a person with a disability such that it compensates for absent or impaired abilities. Assistive Technology (AT) enables the subjects to accomplish not just their activities of daily living (ADLs) but also tasks of occupations and roles. AT can assist in: Self-maintenance, Self-advancement and Self-enhancement. Basic ADLs can be assisted by ATs such as electric toothbrushes and electric shavers, which can increase competency with personal care tasks. Instrumental ADLs (IADLs) can also reap benefit from Text telephones or the erstwhile telecommunication device for the deaf and hands-free or adapted telephones which enable telephonic conversations as well as e-shopping. Electronic Aids to Daily Living (EADLs) are devices used by individuals with mobility impairments to manipulate one or more electronic devices. Subjects with significant disabilities can manage their personal space (i.e., control lights, fans, or the volume on a TV or stereo and opening/locking of main doors) through the use of EADLs like Mini Relax by Ablenet.

On basis of complexity, AT could be Low-technology AT like Dressing aids, pencil grips, picture-based communication boards, magnifiers, padded grips, alternative keyboards etc and High-technology like Power wheelchairs, computers, AAC devices-DynaVox/Tango and the Picture Exchange Communication Systems, remote-controlled devices, specialized hoists, text-to-speech software, Augmented Reflection Technology, VR, robotics etc.

Apart from the routine therapeutics, AT in the form of Virtual Reality, is finding its utility in Pain, Anxiety, and Distraction too for managing subjects with Alzheimers and PTSD by helping them to refamiliarize with certain environments and regain their memory for better mental health and quality of life.

Subtle motor changes from preclinical stages of frank manifestation symptoms associated with Parkinson's disease can be detected through appropriate technology, where these impairments can be unmasked through activities of increased complexity (temporal or cognitive load).

AT in students with disabilities, compensates for reading or writing difficulties and enables the learner to more successfully master higher order learning tasks which in turn promotes inclusivity. An educated child with a disability aided by appropriate AT will have Better participation, Greater opportunities for employment and subsequently Self-reliance.

As per the International Classification of Functioning, Disability and Health (ICF) terminology, AT may be utilized to serve dual purpose of enhancing function at an individual level and improving participation at community level.

Assistive technology devices promote independent living across environmental demands and intrinsic barriers. An apt example for the same would be use of AT for visually impaired individuals where Speaking liquid level indicators, Braille, Talking scales and measures, Braille Dymo™ tape to label microwave ovens, stoves, and canned goods, can make a world of difference to the functional capabilities of these subjects with special needs.

An environment with barriers restricts potential while an environment that facilitates enables the opportunities. Objective assessment using technology like the GPRS, Observational assessments and Questionnaire-based self-report can be utilized to assess environments. To be conducive to functioning, the environment must meet up the pre-requisites of Accessibility, Independent functioning, Enhanced safety and Increased involvement in a life situation, i.e., participation.

Alterations to the physical environment can be in the form of Layout modification, Architectural modifications and Use of adjustable/adaptive equipment. These could be in the form of increasing the width of a door, use of wheelchair, standing frames, Rails, Ramps, Hand grabs etc.

Functional independence in the elderly is dependent upon their capacity to function in their everyday environment. However, the sensory - motor changes associated with aging might compromise the elderly person's independence as they may misinterpret cues from the environment or may experience sensory deprivation. Therefore individuals may need higher thresholds of stimulation to continue to function in the environment. Use of Scalamobile - stair-climbing attachment and Stair Lift can help improve mobility in the Aged population.

AT facilitates the participation and inclusion of persons with limited abilities into all aspects of life, boosting their Self-image, Self-esteem and Sense of self-worth.

However the bigger issue that we face today is the judicious and intelligent usage of technology so as to develop a plan for their effective and efficient use and have regular check-ins to ensure the patient is gaining the maximum value possible and not becoming overly reliant on technology alone. It is of utmost importance, that there is no question in anybody's mind about the role of Technology as a Slave and not the Master.

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