

## Chapter 68

# Promoting Environmental Control, Social Interaction, and Leisure/Academy Engagement Among People with Severe/Profound Multiple Disabilities Through Assistive Technology

**Claudia De Pace**  
*University of Bari, Italy*

**Fabrizio Stasolla**  
*University of Bari, Italy*

### ABSTRACT

*When the authors talk about Assistive Technology (AT) they refer to all technological solutions that allow persons with multiple disabilities and profound cognitive disability to overcome their isolation and passivity to move around their environment, communicate with others, and to be involved developmentally in appropriate activities that they would be unable to do without this technology. There is an increasing range of AT available and the purpose of this contribution is to provide an overview of different aspects of daily living AT that enables people with multiple disabilities to interact independently with their preferred stimuli. The aim of this chapter is to provide an outline of technological resources used in rehabilitation research with persons with severe/profound and multiple disabilities and discuss the use of such resources. We focus on particular rehabilitation programs that involve the use of technological devices within the framework of conventional behavioral intervention for the acquisition and the maintenance of specific responses.*

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## **INTRODUCTION**

In recent years, considerable attention has been given to the developmental and assessment of technological resources for helping persons with severe and profound cognitive disability and multiple disabilities, the benefits of such resources are: reduce their isolation and passivity, reach higher levels of constructive performance, and improve their overall appearance and status. The importance of developing suitable technological resources for these persons is made increasingly obvious by: a) definite discrepancy between the high time costs required for effective treatment programs and the often limited availability of staff in rehabilitation and occupation environments, and b) a realization the most plausible way to reach certain goals (e.g. communication and environmental stimuli control) maybe through extended training without technology.

In view of the aforementioned outcomes, the use of technological resources might be viewed as a critical necessary condition for fostering these people's learning, performance and quality of life within daily contexts.

In particular, we discuss the use of microswitch programs (see below page 5, subsection 2.1) to (1) enable control of environmental events and choose among stimuli through the use of small and simple responses; (2) to promote social contact with the caregivers (VOCA and speech output systems) and to (3) manage particular software to choose preferred stimuli or to enhance education (communication) and occupation/leisure perspectives, by a computer system (keyboard-emulator technology to the use of electronic mail, adapted telephone systems and messaging technology).

Recently, efforts have been made to assess new sensors (microswitches) to help these persons. These new technological devices (a) are considered minimally/moderately invasive and (b) monitor single, relatively simple responses (e.g. deemed less demanding/tiring than combinations of head

movements and cheek puffs or of eye rotations and eyelid closures) to be performed in relation to scanning keyboard emulators.

New research efforts to determine the consistency of these early results may also investigate the possibility of including participants who present some differences compared to those involved in previous studies to extend the suitability of the assessment (Kazdin, 2001; Kennedy, 2005).

## **MULTIPLE DISABILITIES AND ASSISTIVE TECHNOLOGY**

Persons with multiple disabilities, such as cognitive disability combined with motor and visual impairments, are often unable to interact with their environment (Riddley & Rawlings, 2006; Verrotti, Greco, Spalice, Chiarelli, & Iannetti, 2006) and control stimulation opportunities due to very limited response skills (Saunders, Questad, Kedzierski, Boase, Patterson, & Cullinan, 2001; Holburn, Nguyen, & Vietze, 2004; Murphy, Saunders, Saunders, & Olswang, 2004). Often they are confined to a wheelchair or bed and have virtually no chances of constructive engagement with their immediate environment and are unable to play a positive role in their daily context (Holburn, Nguyen, & Vietze, 2004).

This condition (a) makes them look passive and largely dependent, (b) reduce their opportunities of constructive engagement and choice, and thus (c) hinders their prospects of personal development as well as their social image and quality of life.

A possibility of tackling such a condition involves the use of specific technological devices of Assistive Technology.

When we talk about Assistive Technology (AT) we refer to all technological solutions that allow persons with multiple disabilities and profound cognitive disability to overcome their isolation and passivity. AT has several definitions; however, for the purpose of this chapter it can be described

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