# IAAP Certified Professional in

# Accessibility Core Competencies (CPACC)

# Body of Knowledge (BOK)

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## The Purpose of this Document

This Body of Knowledge document outlines the knowledge and skills expected of candidates seeking to obtain the Certified Professional in Accessibility Core Competencies (CPACC) credential. Specifically, the three main purposes of this document are as follows:

* + - 1. List the *categories of information* covered in the exam
      2. Present *general information* about each category
      3. List *additional resources* to help test takers prepare for the exam

The Body of Knowledge is designed to be a starting point when studying for the CPACC exam. It is not intended to be an exhaustive explanation of every concept or question on the exam. Please note that the use of this guide does not guarantee successful completion of the exam.

If you discover any broken links, please contact [certification@accessibilityassociation.org](mailto:certification@accessibilityassociation.org?subject=IAAP%20CPACC%20BOK%20Broken%20Links).

### IAAP Exam Preparation Resources

Test-takers can study resources available anywhere in preparation for the exam. IAAP lists a collection of CPACC resources for preparation that are both free and for purchase. You can find these resources on the [IAAP Prepare for the CPACC Exam webpage](http://bit.ly/2lOAL6b).

The IAAP also maintains a list of IAAP-approved exam preparation providers at [IAAP Certification Providers](http://bit.ly/2kVgeh6). At the time this Body of Knowledge was published, the list consisted of the following:

* Deque University CPACC Course: <https://dequeuniversity.com/curriculum/courses/iaap-cpacc>
* SSB University: <http://www.ssbbartgroup.com/products/ssb-university/>

## About the CPACC Credential

The Certified Professional in Accessibility Core Competencies (CPACC) credential is IAAP's foundational certification, representing the practical application of broad, cross-disciplinary conceptual knowledge about 1) disabilities, 2) accessibility and universal design, and 3) accessibility-related standards, laws, and management strategies. Relevant domains for the CPACC credential include:

* the web and other digital technologies
* architecture and the built environment
* consumer and industrial design
* transportation systems
* any domain in which thoughtful design, policy, and management can improve disability access

The CPACC can be considered the baseline IAAP credential for non-technical accessibility roles. For those who do work at the technical level, IAAP is also offering the Web Accessibility Specialist (WAS) designation in addition to the CPACC credential. Individuals who pass the Certified Professional in Accessibility Core Competencies (CPACC) and the Web Accessibility Specialist (WAS) exams are eligible to carry a higher level credential called the Certified Professional in Web Accessibility (CPWA). The IAAP has plans to grow their domain specific designation offerings and will announce when those additional certification exams are available to the public.

### The CPACC Exam Content at a Glance

#### I. Disabilities, Challenges and Assistive Technologies (40% of the exam)

A. Theoretical Models of Disability

B. Categories of Disabilities and Associated Barriers (ICT and Physical World)

C. Assistive Technologies and Adaptive Strategies

D. Disability Demographics and Statistics

E. Disability Etiquette

#### II. Accessibility and Universal Design (40% of the exam)

* + 1. Individual Accommodations versus Inclusive Design
    2. Benefits of Accessibility
    3. Accessibility in ICT (WCAG 2.0)
    4. Accessibility in the Physical World (The Principles of Universal Design 2.0)
    5. Universal Design for Learning (UDL)
    6. Accessibility and Usability/User Experience (UX)

#### Declaration, Standards, Laws, and Management Strategies (20% of the exam)

* 1. International Conventions and Treaties on Disability Rights
  2. Categories of Disability Laws and Regulations
  3. Applying Accessibility Standards and Regulations
  4. Organizational Governance and Management

## Additional Information

* [IAAP main web site](http://bit.ly/1nnU8vX)
* General information about [IAAP certification](http://bit.ly/1rRdkIY)
* [CPACC Exam Content Outline](http://bit.ly/2oygz6j)
* [CPACC Frequently-Asked Questions](http://bit.ly/2pNw137)
* [CPACC Preparation Resources](http://bit.ly/2lOAL6b)
* [IAAP-Approved Certification Preparation Providers](http://bit.ly/2kVgeh6)
* IAAP webpage: [Process of creating a professional certification](http://bit.ly/2pZZtjc)

# I: Disabilities, Challenges, and Assistive

**Technologies**

## Theoretical Models of Disability

Recommended study tasks:

* 1. Characterize and differentiate between theoretical models of disability, including the strengths and weaknesses of their underlying assumptions
  2. Identify the names, terminology, and basic concepts of prominent theoretical models of disability.
  3. Compare and contrast the underlying assumptions of the different models.
  4. Compare the implications of each model on public and personal perceptions of disability.
  5. Evaluate the strengths and weaknesses of each model
  6. Demonstrate an understanding of which models align most closely with the principles of accessibility and universal design.
  7. Demonstrate an understanding of ways in which various models may overlap or complement each other.
  8. Apply the models to example scenarios in the lives of people with disabilities.

### Medical Model

#### Definition of the Medical Model:

From Disabled World:

The medical model is presented as viewing disability as a problem of the person, directly caused by disease, trauma, or other health condition which therefore requires sustained medical care provided in the form of individual treatment by professionals. In the medical model, management of the disability is aimed at a "cure," or the individual’s adjustment and behavioral change that would lead to an "almost-cure" or effective cure. In the medical model, medical care is viewed as the main issue, and at the political level, the principal response is that of modifying or reforming health care policy.

Disabled World: [Disability Models](http://www.disabled-world.com/definitions/disability-models.php)

From Wikipedia:

The medical model of disability is a sociopolitical model by which illness or disability, being the result of a physical condition intrinsic to the individual (it is part of that individual’s own body), may reduce the individual's quality of life, and cause clear disadvantages to the individual. The medical model tends to believe that curing or at least managing illness or disability mostly or completely revolves around identifying the illness or disability from an in-depth clinical perspective (in the sense of the scientific understanding undertaken by trained healthcare providers), understanding it, and learning to control and/or alter its

course. By extension, the medical model also believes that a "compassionate" or just society invests resources in health care and related services in an attempt to cure disabilities medically, to expand functionality and/or improve functioning, and to allow disabled persons a more "normal" life. The medical profession's responsibility and potential in this area is seen as central.

Wikipedia: [Medical model of disability](http://en.wikipedia.org/wiki/Medical_model_of_disability)

#### Strengths of the Medical Model:

The medical model can address the biological sources of disabilities, either by clinically curing them or providing ways to medically manage the conditions. The medical component of disabilities is a critical reality for many people.

#### Weaknesses of the Medical Model:

The medical model treats disability as a "problem" or inherent characteristic of the individual, and seeks cures or medical management of a bodily condition, often overlooking the broader sociopolitical constraints imposed by unwelcoming or inaccessible environments.

#### Recourses of the Medical Model:

Disability and Society: Independent Living and the Medical Model of Disability Disabled World: [Disability Models](http://www.disabled-world.com/definitions/disability-models.php)

University of Leicester: [The social and medical model of disability](http://www2.le.ac.uk/offices/accessability/staff/accessabilitytutors/information-for-accessability-tutors/the-social-and-medical-model-of-disability)

Disability Nottinghamshire Org UK [The Social Model vs The Medical Model of Disability](http://www.disabilitynottinghamshire.org.uk/about/social-model-vs-medical-model-of-disability/) Wikipedia: [Medical model of disability](http://en.wikipedia.org/wiki/Medical_model_of_disability)

### Social Model

#### Definition of the Social Model:

From Disabled World:

The social model of disability sees the issue of "disability" as a socially created problem and a matter of the full integration of individuals into society. In this model, disability is not an attribute of an individual, but rather a complex collection of conditions, many of which are created by the social environment. Hence, the management of the problem requires social action and is the collective responsibility of society at large to make the environmental modifications necessary for the full participation of people with disabilities in all areas of social life. The issue is both cultural and ideological, requiring individual, community, and large-scale social change. From this perspective, equal access for someone with an impairment/disability is a human rights issue of major concern.

Disabled World: [Disability Models](http://www.disabled-world.com/definitions/disability-models.php)

From Wikipedia:

The social model of disability is a reaction to the dominant medical model of disability which in itself is a functional analysis of the body as machine to be fixed in order to conform with normative values. The social model of disability identifies systemic barriers, negative attitudes and exclusion by society (purposely or inadvertently) that mean society is the main contributory factor in disabling people. While physical, sensory, intellectual, or psychological variations may cause individual functional limitation or impairments, these do not have to lead to disability unless society fails to take account of and include people regardless of their individual differences. The origins of the approach can be traced to the 1960s; the specific term emerged from the United Kingdom in the 1980s.

The social model of disability has come to be one of the most prevalent approaches to disability, and has become somewhat of a rallying cry for disability advocates from a social justice perspective.

Wikipedia: [Social model of disability](https://en.wikipedia.org/wiki/Social_model_of_disability)

#### Strengths of the Social Model:

The social model's focus on the disabling conditions in the environment and in society makes it clear that the barriers and challenges experienced by people with disabilities are not inevitable, nor are they exclusively a characteristic of the individual's "broken" body. Societies can improve the lives of people with disabilities considerably by ensuring that the world around us is designed to accommodate a wide range of human characteristics and abilities.

#### Weaknesses of the Social Model:

The social model of disability can tend to downplay the embodied aspects of disabilities too much, as if disability had nothing to do with bodily characteristics at all. The social model's push for social justice in the political arena can also put activists at odds with people with other political interests, antagonizing relationships and sometimes creating resolute political adversaries.

#### Resources of the Social Model:

Disability Nottinghamshire: [The Social Model vs The Medical Model of Disability](http://www.disabilitynottinghamshire.org.uk/about/social-model-vs-medical-model-of-disability/) University of Leicester: [The social and medical model of disability](http://www2.le.ac.uk/offices/accessability/staff/accessabilitytutors/information-for-accessability-tutors/the-social-and-medical-model-of-disability)

Disabled World: [Disability Models](http://www.disabled-world.com/definitions/disability-models.php)  Wikipedia: [Social model of disability](https://en.wikipedia.org/wiki/Social_model_of_disability)

### Economic Model

#### Definition of the Economic Model:

From Disabled World:

Defines disability by a person’s inability to participate in work. It also assesses the degree to which impairment affects an individual’s productivity and the economic consequences for the individual, employer and the state. Such consequences include loss of earnings for and payment for assistance by the individual; lower profit margins for the employer; and state welfare payments. This model is directly related to the charity/tragedy model.

Disabled World: [Disability Models](http://www.disabled-world.com/definitions/disability-models.php)

#### Strengths of the Economic Model:

The economic model recognizes the effect of bodily limitations on a person’s ability to work, and there may be a need for economic support and/or accommodations for the person’s disability.

#### Weaknesses of the Economic Model:

The economic model creates a legally-defined category of people who are “needy,” which can be stigmatizing for people with disabilities. Also, if a person doesn’t meet the legal threshold for “disabled,” or if there is a dispute as to a person’s disability, the person with the disability may not receive the support they need.

#### Resources of the Economic Model:

Disabled World: [Disability Models](http://www.disabled-world.com/definitions/disability-models.php)

Michigan Disability Rights Coalition: [Models of Disability](http://www.copower.org/leadership/models-of-disability)

### Functional Solutions Model

#### Definition of the Functional Solutions Model:

The functional solutions model of disability is a practical perspective that identifies the limitations (or "functional impairments") due to disability, with the intent to create and promote solutions to overcome those limitations. The primary task is to eliminate, or at least reduce, the impact of the functional limitations of the body through technological or methodological innovation. The pragmatism of the functional solution model deemphasizes the sociopolitical aspects of disability, and instead prioritizes inventiveness and entrepreneurship.

#### Strengths of the Functional Solutions Model:

The strongest aspect of this model is that it is results-oriented. It seeks to provide solutions to real-world challenges, while sidestepping the often convoluted sociopolitical implications of disability within society.

#### Weaknesses of the Functional Solutions Model:

When new technologies are involved, profit-driven entrepreneurs can sometimes miss the mark, creating products that may be innovative but not practical or useful, or which may be of more benefit to the innovators than to the target population, especially if the proposed solutions are expensive. Also, when the primary cause of a particular challenge is the socioeconomic circumstances in the environment, the functional solutions model's de-emphasis on socioeconomic issues can cause would-be innovators to ignore the most important aspects of the original problem.

#### Resources of the Functional Solutions Model:

Marty Cooper: [Models of Disability and Accessibility](https://martyncooper.wordpress.com/2012/10/10/models-of-disability-and-accessibility/)

### Social Identity or Cultural Affiliation Model

#### Definition of the Social Identity or Cultural Affiliation Model:

The social identity or cultural affiliation model refers to a sense of deriving one's personal identity from membership within a group of like-minded individuals. This model is most evident among people who are deaf, because of their shared linguistic experience as sign language users. Deaf culture and identity owes much of its strength to the somewhat exclusive nature of being a part of a close-knit linguistic minority.

Other people with disabilities may also feel a sense of belonging to a community with common life experiences and interests.

#### Strengths of the Social Identity or Cultural Affiliation Model:

The social identity or cultural affiliation model accepts the person's disability completely, and uses it as a point of pride in being associated with other people in a similar condition.

#### Weaknesses of the Social Identity or Cultural Affiliation Model:

Sometimes the sense of belonging felt by one group of people is counterbalanced by a sense of exclusion and not belonging by people who don't quite fit the group's expectations.

#### Resources of the Social Identity or Cultural Affiliation Model:

1. **Charity Model**

**Definition of the Charity Model:**

The charity model regards people with disabilities as unfortunate and in need of assistance from the outside, with those providing charity viewed as benevolent contributors to a needy population.

#### Strengths of the Charity Model:

The charity model can inspire people to contribute their time and/or resources to provide assistance when it is genuinely needed.

#### Weaknesses of the Charity Model:

The charity model can be condescending toward people with disabilities, who may come to resent the feeling that they are the object of pity by other people, and that they must depend on accepting or cultivating this pity on a continual basis. The charity model often focuses on short-term, immediate needs, often at the expense of more comprehensive, and ultimately more effective, long-term solutions.

### Resources

Michigan Disability Rights Coalition: [Models of Disability](http://www.copower.org/leadership/models-of-disability)

NCBI: [US Surgeon General’s Call to Action to Improve the Health and Wellness of Persons with](http://www.ncbi.nlm.nih.gov/books/NBK44667/)  [Disabilities](http://www.ncbi.nlm.nih.gov/books/NBK44667/)

## Characteristics and Categories of Disabilities, Challenges, Including Associated Barriers

### General Resources

Disability Benefits Help: [Disabling Conditions](http://www.disability-benefits-help.org/disabling-conditions)   
Gov.UK: [Equality Act 2010 Guidance pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/570382/Equality_Act_2010-disability_definition.pdf) Disability World: [Types of Disabilities](http://www.disabled-world.com/disability/types/)

Deque University: [Sensory disability](https://dequeuniversity.com/certification/body-of-knowledge/associate/#sensory_2779)  
World Health Organization: [Factsheet](http://www.who.int/mediacentre/factsheets/fs282/en/)

#### Recommended Study Tasks:

* Name the main categories of disabilities.
* Classify specific conditions under their relevant disability category or categories.
* Define assistive technologies.
* Match disability categories with relevant assistive technologies.
* Describe the accessibility challenges faced by people with disabilities of a given category.
* Given a scenario or narrative in an applied domain, identify accessibility challenges for people of various kinds of disabilities, and potential solutions to overcome those challenges.
* Rate the appropriateness of a proposed solution for a person with a specific disability.

### Vision

#### Color Blindness

**Definition:** Color-blindness is a [sensory disability](https://dequeuniversity.com/certification/body-of-knowledge/associate/#sensory_2779) that impairs a person's ability to distinguish certain color combinations.

**Characteristics:** The most common forms of color-blindness affect an individual's ability to distinguish reds and greens, though other colors may be affected.

**Demographics:** Most color-blindness results from a sex-linked genetic trait, thus affecting males and females differently. About 8% of males have some form of color-blindness, compared to about 0.4% of females.

**Assistive Technologies and Methods:** Filtered glasses, filtered overlays on printed or electronic text.

#### Color-Blindness: Examples of Assistive Technologies and Adaptive Strategies

|  |  |  |
| --- | --- | --- |
| **Domain** | **Challenges** | **Solutions** |
| General | Certain color combinations -- red and green in particular -- can be difficult to distinguish | Materials can be designed in a way that does not depend on color as a way to convey information. |

#### Blindness

**Definition:** Blindness is [a sensory disability](https://dequeuniversity.com/certification/body-of-knowledge/associate/#sensory_2779) involving nearly complete vision loss.

**Characteristics:** Some people are completely blind, without the ability to see anything. Others can perceive light versus dark, or the general shapes of large objects, but cannot read text or recognize people by sight.

**Demographics:** About 39 million people, or about 0.5% of the world's population, are blind, [according to the World Health Organization.](http://www.who.int/mediacentre/factsheets/fs282/en/) About 90% of people with visual impairments live in low income settings, and about 82% of people who are blind are aged 50 and above.

**Assistive Technologies and Methods:** Screen readers with audio and/or Braille output for computer access, canes or service animals (such as "seeing eye" dogs) for mobility.

#### Blindness: Examples of Assistive Technologies and Adaptive Strategies

|  |  |  |
| --- | --- | --- |
| **Domain** | **Challenges** | **Solutions** |
| ICT | Cannot see digital or electronic interfaces (computers, automated teller machines (ATMs), mobile devices, airport kiosks, televisions, printers, copiers, phones, GPS devices, etc.) | Screen readers can read interfaces and content out loud to users by converting digital text to synthesized speech, but only if they have been designed to be accessible.  Self-voicing interfaces and applications can communicate to users without the need for a screen reader, but these are appropriate mostly for broadcasting information, because they usually do not use or interact with the interface or content as screen readers do. Refreshable Braille output devices use screen readers to convert digital text to Braille. These devices are typically expensive, and only a minority of blind people know how to read Braille. |
| ICT | Cannot use screen readers on digital content and interfaces not designed with accessibility in mind | Interface designers and content authors can edit the markup to make it compatible with the assistive technologies used by blind people. |
| Architecture & Built Environment | Cannot see when walking | Canes help blind people feel their surroundings as they walk.  Service animals (e.g. "Seeing Eye" dogs), trained to assist blind people, help them navigate their surroundings.  GPS-based walking instructions with an audio interface, either automated or via a remote human navigator.  Raised tiles on the ground to indicate the edge of a platform, a pathway along a sidewalk, the beginning of a staircase, etc. Eliminate low-hanging architectural features that a blind person could bump into  Clear pathways without obstructions in hallways, sidewalks. |
| Architecture & Built Environment | Cannot see signs or other text on buildings or other areas in the built environment | Map and geolocation applications on mobile devices can announce the names and descriptions of buildings and other location- related information.  Braille labels and descriptions on entrances, rooms, bathrooms, historical markers, and other points of interest can allow blind people to explore and understand their surroundings, as long as the person knows Braille, and as long as the Braille labels are easy to find.  Tactile models of the exterior of buildings, or of floorplans of the interior of buildings help blind people form a mental map of their surroundings. |
| **Domain** | **Challenges** | **Solutions** |
| Consumer & Industrial Products | Cannot see or feel the controls on flat interfaces on consumer devices such as microwaves, ovens, dishwashers, etc. | Alternative interfaces with knobs or other tactile controls  Audio interfaces  Remote control through applications on mobile devices. |
| Consumer & Industrial Products | Cannot read the text on the containers or packaging for consumer items such as medicine, toothpaste, shampoo, sunscreen, hand cream, personal care products, foods, drinks, &candy | Embossed Braille (or Braille stickers ) on packaging and product containers help consumers identify items both in the store and after purchase. |
| Consumer & Industrial Products | Cannot read money to determine its value | Applications on mobile devices can photograph the money and read the value to blind people.  Paper bills and coins could be manufactured in different sizes, shapes, or textures to allow blind people to distinguish the value based on touch.  Non-cache systems of payment can allow blind people to make financial transactions via computers, mobile devices, or on-site payment hardware with screen readers or self-voicing output. |
| Consumer & Industrial Products | Cannot read books, magazines, posters, postal mail, or other printed materials | Optical character recognition software can convert scanned images of text into digital text readable by screen readers. The accuracy of the conversion depends on the quality of the original document, as well as font choices, line spacing, and the quality of the conversion software itself.  Information can be placed online or in other digital formats to allow blind people to read the materials using their own assistive technologies. |

#### Low Vision

**Definition:** Low vision is a [sensory disability](https://dequeuniversity.com/certification/body-of-knowledge/associate/#sensory_2779) that impairs a person's vision to the point that corrective lenses cannot restore full visual acuity, but the impairment is not as severe as to be classified as blindness. The threshold for classification as low vision is usually designated as a corrected visual acuity of no better than 20/40 or 20/60.

**Characteristics:** A person with low vision will typically need magnification to see well enough to read or discern other details. Some people with low vision experience low contrast, and therefore benefit from high contrast text and graphics. Some experience color deficiencies, which means they may not be able to see the difference between certain colors.

**Demographics:** About 246 million people, or 3.5% of the world's population, have low vision, [according to the World Health Organization.](http://www.who.int/mediacentre/factsheets/fs282/en/) About 90% of people with vision impairments live in low income settings.

**Assistive Technologies and Methods:** Screen magnifiers, screen readers, increase contrast, increase size of mouse pointer and keyboard caret.

#### Low Vision: Examples of Assistive Technologies and Adaptive Strategies

|  |  |  |
| --- | --- | --- |
| **Domain** | **Challenges** | **Solutions** |
| General | Small text can be hard to read. | Screen magnifiers can enlarge the items on the screen to make them easier to read.  Utilities to enhance contrast, change colors, or alter other aspects of visual appearance can improve legibility.  Screen readers can supplement screen magnifiers by reading interfaces and content out loud to users through synthesized speech, but only if the digital information has been designed to be accessible. Self-voicing interfaces (on ATMs, kiosks, transportation systems, etc.) and applications can communicate to users without the need for a screen reader, but these are appropriate mostly for broadcasting information, because they usually do not use or interact with the interface or content as screen readers do.  Alternative large print versions of small print text can make printed materials easier to read.  Alternative digital versions (web, mobile applications, etc.) of printed materials can give users the ability to read the materials using their own assistive technologies. |
| General | Low contrast text can be hard to read. | Software or hardware options can enhance the contrast of digital text. Interface designers and content creators can choose color combinations with high enough contrast to easily read |

### Auditory Disabilities

#### Deafness

**Definition:** Auditory disabilities are [sensory disabilities](https://dequeuniversity.com/certification/body-of-knowledge/associate/#sensory_2779) that can be categorized as either deafness or hard of hearing. Deafness is the total or near total loss of hearing. Individuals who are hard of hearing have partially-impaired hearing in one or both ears.

**Characteristics:** A person who is deaf or hard of hearing will have difficulty with sounds, including the audio component of multimedia materials. Many, but not all, people who are deaf know sign language. Often sign language is the first language — and therefore the most comfortable native language — of those who are born deaf. They may feel less comfortable reading printed or digital text. By way of contrast, those who lose their hearing later in life may

never learn sign language, or if they learn it, they may not feel as comfortable speaking in sign, and may prefer text.

**Demographics:** Approximately 15% of adults have some degree of hearing loss. About 2% of adults aged 45 to 54 have disabling hearing loss. This percentage increases to 8.5% for adults between 55 and 64, 25% for adults between 65 and 74, and 50% for adults 75 and older. ([According to National Institute on Deafness & Other Communicative Disorders](http://www.nidcd.nih.gov/health/statistics/pages/quick.aspx) in the U.S.)

**Assistive Technologies and Methods:** Hearing aids, cochlear implants, captions for videos, transcripts for video or audio, sign language interpretation.

#### Color-Blindness and ICT: Examples of Assistive Technologies and Adaptive Strategies

|  |  |  |
| --- | --- | --- |
| **Domain** | **Challenges** | **Solutions** |
| ICT | The audio portion of videos cannot be heard | Provide synchronized captions with videos  Provide sign language interpretation  Provide a transcript |
| General | Speeches and talks cannot be heard by deaf people in the room | Provide sign language interpretation Provide live captions on a monitor during the speech |
| Architecture and the Built Environment | Doorbells, alarms, and other sounds may not be heard | Provide alternative visual alerts, such as lights that flash, pulse, dim, turn on, or turn off. |

* 1. **Hard of Hearing**
     1. Understood.org [Difference Between Auditory Processing Disorder and Being Hard of Hearing](https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/auditory-processing-disorder/difference-between-auditory-processing-disorder-being-hard-of-hearing)

Ellen Koslo, Associate Professor of Otolaryngology, Columbia University Medical Center

“Hearing loss, or hearing impairment, is a problem with one or more parts of the ear that interrupts the way sound travels through the hearing system up to the brain. Someone who has hearing loss might be able to hear most sounds, hear only some sounds or possibly nothing at [all”](http://www.asha.org/public/hearing/What-is-Hearing-Loss/)

* + 1. ASHA.org [What is Hearing Loss](http://www.asha.org/public/hearing/What-is-Hearing-Loss/)

When describing hearing loss, we generally look at three categorie[s:](http://www.asha.org/public/hearing/Types-of-Hearing-Loss/) [type of hearing loss](http://www.asha.org/public/hearing/Types-of-Hearing-Loss/) [[conductive hearing loss](http://www.asha.org/public/hearing/Conductive-Hearing-Loss/)[,](http://www.asha.org/public/hearing/Sensorineural-Hearing-Loss/) [sensorineural hearing loss,](http://www.asha.org/public/hearing/Sensorineural-Hearing-Loss/) and [mixed hearing loss](http://www.asha.org/public/hearing/Mixed-Hearing-Loss/).] [,](http://www.asha.org/public/hearing/Degree-of-Hearing-Loss/) [degree of hearing](http://www.asha.org/public/hearing/Degree-of-Hearing-Loss/)  [loss](http://www.asha.org/public/hearing/Degree-of-Hearing-Loss/) [Degree of hearing loss refers to the severity of the loss - range in decibels (dB HL).], and  [configuration of hearing loss](http://www.asha.org/public/hearing/Configuration-of-Hearing-Loss/) [the degree and pattern of hearing loss across frequencies (tones)].

* + 1. ASHA.org [Effects of Hearing Loss on Development](http://www.asha.org/public/hearing/Effects-of-Hearing-Loss-on-Development/)

“The earlier hearing loss occurs in a child's life, the more serious the effects on the child's development. Similarly, the earlier the problem is identified and intervention begun, the less serious the ultimate impact.

There are four major ways in which hearing loss affects children:

1. It causes delay in the development of receptive and expressive communication skills (speech and language).
2. The language deficit causes learning problems that result in reduced academic achievement.
3. Communication difficulties often lead to social isolation and poor self-concept.
4. It may have an impact on vocational choices.”

Specific Effects: Vocabulary, Sentence Structure, Speaking, Academic Achievement, Social Functioning

* ASHA.org [Auditory Processing Disorder](http://www.asha.org/public/hearing/Auditory-Processing-Disorder/)

“Auditory processing disorder (APD) is often described as greater than expected difficulty hearing and understanding speech even though no measurable hearing loss exists. Individuals with auditory processing disorders may act as though a hearing loss is present when in fact, hearing sensitivity is often within normal limits. APD is often confused with other disorders such as ADHD, language impairment, learning disabilities, social and emotional delays or cognitive deficits.”

all.”

“So how does hearing loss differ from an auditory processing disorder (APD)?

APD is not the inability to hear. It’s the inability to interpret, organize, or analyze what’s heard. All the parts of the hearing pathway are working well. But parts of the brain are not.”

* Hearing.com [Central Auditory Processing Disorder](https://www.hearing.com.au/central-auditory-processing-disorder/)

“Central Auditory Processing Disorder (CAPD)—also known as Auditory Processing Disorder (APD)—is an umbrella term for a variety of disorders that result in a breakdown in the hearing process.

These disorders occur in the higher processing sections of the brain. For CAPD sufferers, this generally means the brain cannot make sense of what our ears hear because the auditory signal is distorted in some way. As a result, one of the biggest problems experienced by people with CAPD is difficulty listening with background noise.”

“Because CAPD makes distinguishing speech within noise hard for children, they find it difficult to focus, they get frustrated, their schoolwork suffers and they get tired from trying to hear.”

Hearing loss, or hearing impairment, is a problem with one or more parts of the ear that interrupts the way sound travels through the hearing system up to the brain.

[Auditory Processing Disorder] is not the inability to hear. It’s the inability to interpret, organize, or analyze what’s heard. All the parts of the hearing pathway are working well. But parts of the brain are not.

Hearing loss and APD ... have some symptoms in common. But the treatment options are very different. That’s why it’s a good idea to work with professionals who are trained to recognize the difference.

* Understood.org: [Difference between auditory processing disorder being hard of hearing](https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/auditory-processing-disorder/difference-between-auditory-processing-disorder-being-hard-of-hearing)

When describing hearing loss, we generally look at three categories: type of hearing loss, degree of hearing loss, and configuration of hearing loss. With children, it is especially important to diagnose and treat a hearing loss as early as possible. This limits its potential impact on learning

and development. Hearing loss can greatly affect the quality of life for adults as well. Unmanaged hearing loss can have an impact on employment, education, and general well- being.

* ASHA.org [What is Hearing Loss](http://www.asha.org/public/hearing/What-is-Hearing-Loss/)

Individuals with auditory processing disorders may act as though a hearing loss is present when in fact, hearing sensitivity is often within normal limits. APD is often confused with other disorders such as ADHD, language impairment, learning disabilities, social and emotional delays or cognitive deficits. It is important to take a multidisciplinary approach for accurate diagnosis of this disorder. Members of the team may include the speech-language pathologist, psychologist, classroom teacher, physician, parent and the audiologist.

### Deafblindness

**Definition:** Deafblindness is [a sensory disability](https://dequeuniversity.com/certification/body-of-knowledge/associate/#sensory_2779) that includes both deafness and blindness.

**Characteristics:** A person who is both deaf and blind experiences all the characteristics of those two disabilities, with the added complexity that the absence of both vision and hearing severely limits the sensory input possibilities of the individual to just touch, smell, and taste. Of those senses, touch is the only viable method for complex communication. A deafblind person would need to learn Braille to access text, and sign language to access conversations (the deafblind person would feel the hands of the other person signing in the conversation).

**Demographics:** Approximately 35,000-50,000 individuals in the United States (about 0.014%) are both deaf and blind, according to [research referenced by an info page at Gallaudet](http://libguides.gallaudet.edu/content.php?pid=119476&amp;sid=1029203)  [University](http://libguides.gallaudet.edu/content.php?pid=119476&amp;sid=1029203).

**Assistive Technologies and Methods:** Transcripts for video or audio converted to Braille, tactile sign language interpretation.

#### Color-Blindness and ICT: Examples of Assistive Technologies and Adaptive Strategies

|  |  |  |
| --- | --- | --- |
| Domain | Challenges | Solutions |
| ICT | Digital text cannot be seen | A screen reader can convert text to Braille on a refreshable Braille device, or "printed" in a Braille embosser. |
| ICT | Audio (including the audio portion of videos) cannot be heard | A text transcript of the audio can be converted to refreshable Braille by a screen reader, or "printed" in a Braille embosser. |

### Mobility, Flexibility, and Body Structure Disabilities

#### Manual Dexterity/Fine Motor Control

* + - Use My Ability: [Motor Manual Dexterity and use of ICT](http://usemyability.com/resources/skills_abilities/motor-manual-dexterity-and-use-of-ict.html)

“Restricted manual dexterity may be temporary, recurring or permanent, and may be caused by a wide range of disabilities and medical conditions.

Limited motor/manual dexterity may cause difficulties with the following:

* + - * Using equipment in the work or learning environment Producing demonstrations or presentations in electronic fhttp://www.amacusg.gatech.edu/playbook/index.php?title=Georgia\_Board\_of\_Regents\_Consolidation\_Planormat;
      * Communicating using email, web browsers or blogs;
      * Storage and organisation of data;
      * Using core computer programmes to produce common digital information such as word documents (e.g. Microsoft Word) and presentations (e.g. Microsoft PowerPoint);
      * Using computer programmes such as Excel to solve problems or analyse data;
      * Engaging with e-learning.”

“Impairments that may impact on motor/manual dexterity

* + - * [Physical Impairments](http://usemyability.com/resources/impairments/physical-impairments.html) (including, for example, those caused by a stroke, neck injury, Repetitive Strain Injury and other medical conditions)
      * [Dyspraxia](http://usemyability.com/resources/impairments/dyspraxia.html) [is a specific learning difficulty (SpLD) that affects the brain’s ability to plan sequences of movement. ]
      * a wide range of medical conditions, for example, rheumatoid arthritis “
    - Interactive Accessibility [5 tips improve web mobility/dexterity disabilities](http://www.interactiveaccessibility.com/blog/5-tips-improve-web-mobilitydexterity-disabilities)

By [Kathy Wahlbin](http://www.interactiveaccessibility.com/web-accessibility-experts) on September 10, 2012

“Mobility impairment is a broad category of physical disabilities that include upper limb and manual dexterity disabilities, loss of fine-motor control, and disabling conditions such as cerebral palsy and carpal tunnel syndrome. The disabilities may be temporary or permanent; they may range in severity from mild loss of fine-motor control to quadriplegia; they may be the consequence of aging, accident, heredity, disease. Users may have limited arm or hand movement, use just one hand, have a tremor, have difficulty with fine movements, or be unable to hold a mouse.

Not surprisingly, given the range of mobility/dexterity disabilities, a wide variety of assistive technologies are available for these users, including touch screens, head / mouth wands, special switches, keyboard overlays, one-handed keyboards, oversized mouse or trackball, and speech recognition applications like Dragon Naturally Speaking.”

#### Ambulation

* + - Disabled World: <http://www.disabled-world.com/assistivedevices/mobility/>
    - National Institutes of Health: Energy cost of ambulation in health & disability: a literature review
* Social Security Administration: [Listing of Impairments](https://www.ssa.gov/OP_Home/cfr20/404/404-app-p01.htm)
* Journal of Physical Therapy PDF: [Study of Musculoskeletal Ambulation Disability](https://www.jstage.jst.go.jp/article/jpts/24/2/24_201/_pdf)

“Motor disorders, including joint diseases, falls, and fractures, are the leading causes of care dependency and a markedly decreased quality of life in the elderly 2).” “Musculoskeletal ambulation disability symptom complex (MADS). MADS is defined is an

increased risk of falls and isolation due to an age-related decline in balance and walking ability”

* Social Security Administration: [Musculoskeletal Adult](https://www.ssa.gov/disability/professionals/bluebook/1.00-Musculoskeletal-Adult.htm)

“Inability to ambulate effectively means an extreme limitation of the ability to walk; i.e.; an impairment(s) that interferes very seriously with the individual’s ability to independently initiate, sustain or complete activities. Ineffective ambulation is defined generally as having insufficient lower extremity functioning (see 1.00J) to permit independent ambulation without the use of a hand-held assistive device(s) that limits the functioning of both upper extremities.”

#### Muscle Fatigue

* + - National Institutes of Health: [Perceived Disabilities](http://www.ncbi.nlm.nih.gov/pubmed/17432393)
    - National Institutes of Health: [Disability and back muscle fatigability changes following two](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3628866/) [therapeutic exercise interventions in participants with recurrent low back pain](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3628866/)
* Center for Disease Control: [General Information](http://www.cdc.gov/cfs/general/)
* Disability World: [Fibromyalgia](http://www.disabled-world.com/health/fibromyalgia/)

#### Body Size

* + - U.S. Department of Health & Human Services: [Examining the Relationships between Excess](https://aspe.hhs.gov/basic-report/examining-relationships-between-excess-body-weight-health-and-disability)  [Body Weight, Health and Disability](https://aspe.hhs.gov/basic-report/examining-relationships-between-excess-body-weight-health-and-disability)
* Disability Health Benefits Help: [Dwarfism and Social Security Disability Benefits](http://www.disability-benefits-help.org/disabling-conditions/dwarfism-and-social-security-disability-benefits)

“There are many different disorders that cause dwarfism that affect thousands of Americans. The most common form is achondroplasia, a type of skeletal dysplasia, which affects about 70 percent of those with dwarfism, the National Library of Medicine explained. “

“Children with dwarfism, in addition to having problems with their skeletal system, may also suffer from hearing loss, vision loss, heart defects, intense pain, arthritis, and breathing problems, which can follow them into adulthood and drive up healthcare costs substantially throughout their lifetime. “

* Little People of America: [FAQ](http://www.lpaonline.org/faq-)

“Certainly many short-statured people could be considered disabled as a result of conditions, mainly orthopedic, related to their type of dwarfism. In addition, access issues and problems exist even for healthy LPs. Consider, for example, the simple fact that most achondroplastic adults cannot reach an automated teller machine. LPA is working to make common activities easily reachable by people with dwarfism - including gas pumps, pay phones, and ATM's.”

* Mayo Clinic: [Acromegaly](http://www.mayoclinic.org/diseases-conditions/acromegaly/home/ovc-20177622)

“Acromegaly is a hormonal disorder that develops when your pituitary gland produces too much growth hormone during adulthood. When this happens, your bones increase in size, including those of your hands, feet and face. Acromegaly usually affects middle-aged adults.”

“Symptoms and causes [: Fatigue and muscle weakness, Impaired vision, Excessive sweating and body odor, Pain and limited joint mobility.]”

“Progression of acromegaly can result in major health problems. Complications may include: [High blood pressure (hypertension), Cardiovascular disease, particularly enlargement of the heart (cardiomyopathy), Osteoarthritis, Diabetes mellitus.]”

* The NHS in England: [Restricted Growth (dwarfism) Introduction](http://www.nhs.uk/Conditions/Restricted-growth/Pages/Introduction.aspx)

“Restricted growth, sometimes known as dwarfism, is a condition characterised by short stature.

There are two main types of restricted growth:

* + proportionate short stature (PSS) – a general lack of growth, where the length of the trunk and limbs are in proportion
  + disproportionate short stature (DSS) – where the limbs are shorter or out of proportion with other parts of the body”

“However, most people don't have any other serious problems. They can often live a relatively normal life and have a normal life expectancy.”

#### Body Shape or Form

* + - SSN Disability Benefits Help: [Amputation and Social Security Disability](http://www.disability-benefits-help.org/disabling-conditions/amputation-and-social-security-disability)
    - NEADS: [Making Extra-Curricular Activities Inclusive](http://www.neads.ca/en/about/projects/inclusion/guide/pwd_01.php)

“A physical disability is one that affects a person's mobility or dexterity. A person with a physical disability may need to use some sort of equipment for assistance with mobility. It also includes people who have lost limbs or who, because of the shape of their body, require slight adaptations to be made to enable them to participate fully in society. “

* + - SSN Disability Benefits Help: [Musculoskeletal System](http://www.disability-benefits-help.org/disabling-conditions/musculoskeletal-system)

“disability claims for musculoskeletal disorders relate primarily to how the disability affects your ability to move, perform tasks, and concentrate on a job.”

* + - SSN Disability Benefits Help: [Apert Syndrome](http://www.disability-benefits-help.org/disabling-conditions/apert-syndrome-and-social-security-disability)

“Apert Syndrome and Disability Benefits Also known as Acrocephalosyndactyly Type I, Apert syndrome is a rare genetic disorder that causes early and abnormal fusion of bones, especially in the head, hands, and feet. Infants with Apert syndrome are born with cranial and facial deformities. Other birth defects may be present as well. Intellectual deficits are sometimes present and children and adults with Apert syndrome often experience other complications, including hearing loss, sleep apnea, and chronic ear and sinus infections.

Individuals with Apert syndrome usually require multiple surgeries in infancy and early childhood. They often need specialized attention and care throughout childhood and sometimes into adulthood.”

* + - SSN Disability Benefits Help: [Clubfoot Deformity](http://www.disability-benefits-help.org/disabling-conditions/club-fort-deformity)

“Clubfoot Deformity and Social Security Disability

Clubfoot is a birth defect with a relatively high incidence rate. In those affected by the condition, one or both feet are malformed at birth, turning inward and down, affecting their ability to stand, walk, balance and perform other essential functions. Though treatments are available, including exercise, physical therapy, use of braces or casts, and even surgery in some cases, there is no cure for the condition.

Some who suffer from clubfoot deformity may experience limitations on range of motion and pronounced pain for years following even the most successful treatments. In cases where the condition is left untreated, it can worsen over time, resulting in significant disability.”

* + - Australian Government: Australian Institute of Health and Welfare: [Arthritis, osteoporosis and](http://www.aihw.gov.au/arthritis-and-musculoskeletal-conditions/)  [other musculoskeletal conditions](http://www.aihw.gov.au/arthritis-and-musculoskeletal-conditions/)

“[Rheumatoid arthritis](http://www.aihw.gov.au/rheumatoid-arthritis/) is an auto-immune disease causing chronic inflammation of the joints. It most commonly affects the hand joints and can lead to deformities of the hands.

[Osteoporosis](http://www.aihw.gov.au/osteoporosis/) is a condition where there is a progressive loss of bone density and decrease in the strength of the skeleton with a resultant risk of fracture.”

### Cognitive Disabilities

Cognitive and intellectual disabilities may result from a variety of conditions or injury. These disabilities may be a component of other disabilities such as closed traumatic brain injury or may occur on their own. When disabilities occur together the challenges can be increased or become more complicated by the addition of emotional and physical reactions specific to the challenge such as performance anxiety or fatigue.

Giving individuals with cognitive and intellectual disabilities additional time is critical to their success at tasks such as reading, calculating, writing or speaking. There are assistive technologies (AT) which may be critical to the success in doing these tasks including screen readers, calculators, speech-to-text programs and captioning, spell-checkers, grammar checkers, picture dictionaries, writing templates, organizational aids, and color coding such as highlighters.

Many of these technologies have become commonplace and are used by many people with and without disabilities or are used by people with disabilities we did not know would benefit from them when they were designed. Screen readers and Captioning are two such AT which are used by populations for which they original designer had no idea would benefit – cognitive and intellectual disabilities.

#### Intellectual Disabilities

AAIDD: [Definition of Intellectual Disability](http://aaidd.org/intellectual-disability/definition#.V8gbQpMrKRs)

*“Intellectual disability* is a disability characterized by significant limitations in both **intellectual functioning** and in **adaptive behavior**, which covers many everyday social and practical skills. This disability originates **before the age of 18**.

“*Intellectual functioning*—also called intelligence—refers to general mental capacity, such as learning, reasoning, problem solving, and so on.

“*Adaptive behavior* is the collection of conceptual, social, and practical skills that are learned and performed by people in their everyday lives.

* + 1. Conceptual skills—language and literacy; money, time, and number concepts; and self- direction.
* Social skills—interpersonal skills, social responsibility, self-esteem, gullibility, naïveté (i.e., wariness), social problem solving, and the ability to follow rules/obey laws and to avoid being victimized.
  1. Practical skills—activities of daily living (personal care), occupational skills, healthcare, travel/transportation, schedules/routines, safety, use of money, use of the telephone.”
  2. Memory
* W3C: [COAG User Research](https://www.w3.org/TR/coga-user-research/#memory-2): Memory

#### Reading and Dyslexia

* National Institute for Learning Development Canada: [Learning Disabilities](https://nildcanada.org/learning-disabilities/)
* National Institute of Neurological Disorders and Stroke: [Dyslexia](http://www.ninds.nih.gov/disorders/dyslexia/dyslexia.htm)

Reading disabilities may include specific inability to perceive text or to process the meaning of words, phrases and ideas. The disability may be the result of a congenital difference, injury, delayed development, neurological or physical disability. Some specific reading disabilities have been identified and are recognized by professionals by diagnosis, such as Dyslexia. Often the diagnosis of a Learning Disability will include components of a reading impairment.

Dyslexia is a brain-based type of learning disability that specifically impairs a person's ability to read. These individuals typically read at levels significantly lower than expected despite having normal intelligence. Although the disorder varies from person to person, common characteristics among people with dyslexia are difficulty with phonological processing (the manipulation of sounds), spelling, and/or rapid visual-verbal responding. In individuals with adult onset of dyslexia, it usually occurs as a result of brain injury or in the context of dementia; this contrasts with individuals with dyslexia who simply were never identified as children or adolescents. Dyslexia can be inherited in some families, and recent studies have identified a number of genes that may predispose an individual to developing dyslexia.

#### Reading Disabilities and ICT: Examples of Assistive Technologies and Adaptive Strategies

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| --- | --- | --- |
| **Domain** | **Challenges** | **Solutions** |
| ICT | Often perceive words as floating and not in a line. | Can use a special font developed for Dyslexia which weights the letters down and makes similar figures appear differently  May be granted additional time to complete tasks |
| ICT | Often perceive words differently than others such as seeing p b d q as the same letter. | Can change the font, contrast or add an underline to text to keep words in line.  May be granted additional time to complete tasks |
| ICT | Often require additional time to read and process content. | Can extend time outs and return to the same location on the page.  Can use a screen reader to get content in an auditory method to reinforce what is being seen Can use screen readers which highlight the word or phrase being read to assist with tracking.  Can use enhanced visible focus indicators to keep track of their position on the page.  Can use special programs or dictionaries which present words with pictures.  May be granted additional time to complete tasks |
| ICT | Often have the burden of deciphering content from the way it is presented. | May apply a custom style sheet |
| ICT | May have difficulty solving problems presented through security features such as CAPTCHA | Ability to change the type of problem presented |
| ICT | May have difficulty processing content through visual means | Can use a screen reader to get content in an auditory method to reinforce what is being seen May be granted additional time to complete tasks |
| ICT | May have a hard time spelling words correctly | Can use a spelling and grammar checker |

* 1. **Math and Computation**

Understood: [Dyscalculia](https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/dyscalculia) Understood: [Dysgraphia](https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/dysgraphia)

Dyscalculia: [Dyscalculia](http://www.dyscalculia.org/)

National Institute for Learning Development Canada: [Learning Disabilities](https://nildcanada.org/learning-disabilities/)

Math and computational disabilities impact a person’s ability to learn and communicate math. The characteristics of Math Learning Disabilities include an inability to understand arithmetic and how to calculate (Dyscalculia) and an inability to draw or copy figures and graphs (Dysgraphia). As with Reading Disabilities, Math Disabilities may be of a congenital origin; result from an injury or other events such as stroke or aging. Anxiety is often coupled with Math Learning Disability which can further complicate the challenges.

#### Math and ICT: Examples of Assistive Technologies and Adaptive Strategies

|  |  |  |
| --- | --- | --- |
| **Domain** | **Challenges** | **Solutions** |
| ICT | Inability to distinguish right from left in graphic images | Can read data in a data table or text description as an alternative to graphic representations of data when an alternative is provided.  May be granted additional time to complete tasks |
| ICT | Inability to copy graphs, figures and diagrams | Can use speech-to-text to verbalize instructions for completing homework and test questions when the questions are designed to accessibility guidelines and text-to-speech assistive technology can access content.  May be granted additional time to complete tasks |
| ICT | Inability to perform calculations | Can use an accessibility accommodation link to a reference sheet with common equations when provided  Can use an onscreen calculator as an accommodation May be granted additional time to complete tasks |

* 1. **Attention Deficit**

National Institute of Neurological Disorders and Stroke: [Attention Deficit Hyperactivity](http://www.nimh.nih.gov/health/topics/attention-deficit-hyperactivity-disorder-adhd/index.shtml)  [Disorder](http://www.nimh.nih.gov/health/topics/attention-deficit-hyperactivity-disorder-adhd/index.shtml)

“Attention-deficit/hyperactivity disorder (ADHD) is a brain disorder marked by an ongoing pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development.

* Inattention means a person wanders off task, lacks persistence, has difficulty sustaining focus, and is disorganized; and these problems are not due to defiance or lack of comprehension.
* Hyperactivity means a person seems to move about constantly, including situations in which it is not appropriate when it is not appropriate, excessively fidgets, taps, or talks. In adults, it may be extreme restlessness or wearing others out with their activity.
* Impulsivity means a person makes hasty actions that occur in the moment without first thinking about them and that may have high potential for harm; or a desire for immediate rewards or inability to delay gratification. An impulsive person may be socially intrusive and excessively interrupt others or make important decisions without considering the long-term consequences.”

Foundation for People with Learning Disabilities UK: [Attention Deficit Hyperactivity](http://www.learningdisabilities.org.uk/help-information/learning-disability-a-z/a/attention-deficit-hyperactivity-disorder-adhd/)  [Disorder (ADHD)](http://www.learningdisabilities.org.uk/help-information/learning-disability-a-z/a/attention-deficit-hyperactivity-disorder-adhd/)

“Many people with ADHD also experience additional problems such as sleep disorders, and may have further learning difficulties caused by their difficulty with holding attention.

ADHD has no effect on intelligence, but some people with a learning disability may also have ADHD.”

“How it affects people

The effects of ADHD on children can be very disruptive at both school and home. While their intellect may be normal or advanced, more than half of children with ADHD have additional specific learning difficulties, such as dyslexia.

People with ADHD may experience low self-esteem or underachievement due to the difficulties involved in managing their symptoms.

They are also more likely to be depressed, anxious, or obsessive, and they may have problems with speech, language and coordination.

People with ADHD need high levels of stimulation, so often find working in a constantly-moving environment beneficial.

When properly motivated or working on something of particular interest to them, they are able to maintain a high attention to detail and a consistent work ethic.”

“How many people have Attention Deficit Hyperactivity Disorder?

It is estimated that [the condition affects 2-5% of school-aged children and young people.](http://www.nhs.uk/Conditions/Attention-deficit-hyperactivity-disorder/Pages/Introduction.aspx) It is up to four times more common in male children than in female children.”

#### Learning

Learning Disability UK: [A very brief guide to learning disability](http://www.learningdisability.co.uk/learning-disability/)

“People with a learning disability are a very diverse group with a wide range of abilities. A person with a ‘mild learning disability’ may live in their own house (or in a house shared with other people), work, and raise children. They will probably need advice and support in these tasks from time to time. “

“By contrast, someone with a ‘severe or profound learning disability’ will probably be unable to use speech, may be incontinent and physically-disabled, and need help with simple tasks like eating and drinking. “

“Learning disability is assessed by a combination of intelligence tests and measures of ‘adaptive behaviour’ (i.e. a person’s ability to carry out everyday tasks). In the UK, the threshold for learning disability is usually set at an IQ of below 70. But people with a learning disability do not fall into a few discrete groups, and their IQ scores may not reflect how well they cope with life. Nor are their abilities fixed forever. People with a learning disability are able to carry on learning new skills throughout adulthood.”

National Institute of Neurological Disorders and Stroke: Learning Disabilities Information Page

“Learning disabilities are disorders that affect the ability to understand or use spoken or written language, do mathematical calculations, coordinate movements, or direct attention. Although learning disabilities occur in very young children, the disorders are usually not recognized until the child reaches school age. Research shows that 8 to 10 percent of American children under 18 years of age have some type of learning disability.”

Wikipedia: [Learning disability](https://en.wikipedia.org/wiki/Learning_disability)

“While *learning disability, learning disorder* and *learning difficulty* are often used interchangeably, they differ in many ways. Disorder refers to significant learning problems in an academic area. These problems, however, are not enough to warrant an official diagnosis.

Learning disability on the other hand, is an official clinical diagnosis, whereby the individual meets certain criteria, as determined by a professional (psychologist, pediatrician, etc.). The difference is in degree, frequency, and intensity of reported symptoms and problems, and thus the two should not be confused. When the term "learning disorder" is used, it describes a group of disorders characterized by inadequate development of specific academic, language, and speech skills. Types of learning disorders include reading ([dyslexia](https://en.wikipedia.org/wiki/Dyslexia)), mathematics ([dyscalculia](https://en.wikipedia.org/wiki/Dyscalculia)) and writing ([dysgraphia](https://en.wikipedia.org/wiki/Dysgraphia))[.](https://en.wikipedia.org/wiki/Learning_disability#cite_note-ChildhoodVoyagesinDevelopmentThirdEdition-2)

Wikipedia: [Dyslexia](https://en.wikipedia.org/wiki/Dyslexia)

“Dyslexia, also known as reading disorder, is characterized by trouble with [reading](https://en.wikipedia.org/wiki/Reading_%28process%29) despite norma[l](https://en.wikipedia.org/wiki/Intelligence) [intelligence](https://en.wikipedia.org/wiki/Intelligence). Different people are affected to varying degrees[.](https://en.wikipedia.org/wiki/Dyslexia#cite_note-NIH2014Def-2) Problems may include difficulties in [spelling](https://en.wikipedia.org/wiki/Spelling) words, reading quickly[,](https://en.wikipedia.org/wiki/Handwriting) [writing words,](https://en.wikipedia.org/wiki/Handwriting) "sounding out" words [in the head,](https://en.wikipedia.org/wiki/Subvocalization) pronouncing words when reading aloud and understanding what one reads[.](https://en.wikipedia.org/wiki/Dyslexia#cite_note-NIH2014Def-2)”

Wikipedia: [Dyscalculia](https://en.wikipedia.org/wiki/Dyscalculia)

“Dyscalculia is difficulty in learning or comprehending [arithmetic,](https://en.wikipedia.org/wiki/Arithmetic) such as difficulty in understanding numbers, learning how to manipulate numbers, and learning facts in mathematics. It is generally seen as a [specific developmental disorder.](https://en.wikipedia.org/wiki/Specific_developmental_disorder)

Dyscalculia can occur in people from across the whole [IQ](https://en.wikipedia.org/wiki/IQ) range, often, but not always, involving difficulties with time, measurement, and [spatial reasoning](https://en.wikipedia.org/wiki/Spatial_visualization_ability). Estimates of the prevalence of dyscalculia range between 3 and 6% of the population. A quarter of children with dyscalculia have [ADHD](https://en.wikipedia.org/wiki/ADHD)[.](https://en.wikipedia.org/wiki/Dyscalculia#cite_note-7)”

Wikipedia: [Dysgraphia](https://en.wikipedia.org/wiki/Dysgraphia)

“Dysgraphia is a deficiency in the ability to write, primarily [handwriting,](https://en.wikipedia.org/wiki/Handwriting) but also coherence[.](https://en.wikipedia.org/wiki/Dysgraphia#cite_note-1) Dysgraphia is a transcription disability, meaning that it is a writing disorder associated with impaired handwriting, orthographic coding ([orthography,](https://en.wikipedia.org/wiki/Orthography) the storing process of written words and processing the letters in those words), and finger sequencing (the movement of muscles required to write)[.](https://en.wikipedia.org/wiki/Dysgraphia#cite_note-Berninger_2009-2) It often overlaps with other learning disabilities such as [speech impairment](https://en.wikipedia.org/wiki/Speech_impairment)[,](https://en.wikipedia.org/wiki/Attention_deficit_disorder)  [attention deficit disorder,](https://en.wikipedia.org/wiki/Attention_deficit_disorder) or [developmental coordination disorder](https://en.wikipedia.org/wiki/Developmental_coordination_disorder)[.](https://en.wikipedia.org/wiki/Dysgraphia#cite_note-Nicolson-3)”

#### Language

Wikipedia: [List of Language Disorders](https://en.wikipedia.org/wiki/List_of_language_disorders) HASA [Language-Based Learning Disabilities](http://hasa.org/topics/language-based-learning-disabilities/)

“Language-based learning disability is a term that may be used to cover several different types of learning disabilities in which impaired language ability is the common characteristic.

The initial impact occurs with delays in spoken language that may affect speech, but more commonly affects the ability to understand words and select appropriate vocabulary to express ideas. Often times this early difficulty will lead to uneven development of language abilities that are critical for academic learning and higher emergent literacy skills including reading, spelling and writing.”

NIDCD: [Apraxia Speech](https://www.nidcd.nih.gov/health/apraxia-speech)

“[Apraxia](https://www.nidcd.nih.gov/glossary/apraxia) of speech, also known as verbal apraxia or dyspraxia, is a speech disorder in which a person has trouble saying what he or she wants to say correctly and consistently. It is not due to weakness or paralysis of the speech muscles (the muscles of the face, tongue, and lips). The severity of apraxia of speech can range from mild to severe.”

“There are two main types of speech apraxia: acquired apraxia of speech and developmental apraxia of speech. Acquired apraxia of speech can affect a person at any age, although it most typically occurs in adults. It is caused by damage to the parts of the brain that are involved in speaking, and involves the loss or impairment of existing speech abilities. The disorder may result from a stroke, head injury, tumor, or other illness affecting the brain. Acquired apraxia of speech may occur together with muscle weakness affecting speech production ([dysarthria](https://www.nidcd.nih.gov/glossary/dysarthria)) or language difficulties caused by damage to the nervous system ([aphasia](https://www.nidcd.nih.gov/glossary/aphasia)).

Developmental apraxia of speech (DAS) occurs in children and is present from birth. It appears to affect more boys than girls. This speech disorder goes by several other names, including developmental verbal apraxia, developmental verbal dyspraxia, articulatory apraxia, and childhood apraxia of speech. “Autism Spectrum Disabilities

Autism Speaks: [What is Autism](https://www.autismspeaks.org/what-autism)

“Autism spectrum disorder (ASD) and autism are both general terms for a group of complex disorders of brain development. These disorders are characterized, in varying degrees, by difficulties in social interaction, verbal and nonverbal communication and repetitive behaviors. With the May 2013 publication of the DSM-5 diagnostic manual, all autism disorders were merged into one umbrella diagnosis of ASD. Previously, they were recognized as distinct subtypes, including autistic disorder, childhood disintegrative disorder, pervasive developmental disorder-not otherwise specified (PDD-NOS) and Asperger syndrome.

ASD can be associated with intellectual disability, difficulties in motor coordination and attention and physical health issues such as sleep and gastrointestinal disturbances. Some persons with ASD excel in visual skills, music, math and art.”

Communication Speech Pathology: [Autism and Asperger’s Syndrome](http://communicatespeech.com.au/resources/communication-disorders)

Autistic Spectrum Disorders are characterized by three main areas of difficulty – impaired communication skills, impaired social interactions and restrictive or repetitive behaviours or interests. Individuals with Autism often have the following difficulties with their communication:

* + Delayed/disordered language skills
  + Lack of joint attention
  + Limited eye contact
  + Lack of understanding and use of non-verbal communication including gestures and facial expressions
  + Echolalia often in the form of repetition of phrases from television
  + Limited play skills particularly imaginative play
  + Difficulties in conversations including initiating and sustaining conversations and topic maintenance in conversations
  + Overly literal interpretation of language and difficulties with abstract or figurative language

Children with Autism are usually diagnosed prior to 3yrs of age often due to significant delay in the development of language skills. Autism is a spectrum disorder meaning that the level of difficulty can vary greatly from severe to mild across different individuals. At the severe end of the spectrum, the child may have significant intellectual impairment and be non-verbal. At the mild end the child may be quite high functioning.

Individuals with Asperger’s Syndrome also have difficulties with communication, social skills and repetitive or restrictive behaviours but experience no significant delay in the acquisition of early language skills. In fact, the young child with Asperger’s may be described as having precocious language and a large vocabulary (even though it may not be semantically well developed).

Individuals with Asperger’s do not have impaired cognitive skills and may present with above average intellect.”

Wikipedia: [Autism](https://en.wikipedia.org/wiki/Autism)

“Social communication disorders may include problems with social interaction, social cognition, and pragmatics. A social communication disorder may be a distinct diagnosis or may occur within the context of other conditions, such as autism spectrum disorder (ASD), specific language impairment (SLI), learning disabilities (LD), language learning disabilities (LLD), intellectual disabilities (ID), developmental disabilities (DD), attention deficit hyperactivity disorder (ADHD), and traumatic brain injury (TBI). Other conditions (e.g., psychological/emotional disorders and hearing loss) may also impact social communication skills. In the case of ASD, social communication problems are a defining feature along with restricted, repetitive patterns of behavior.”

“Autism is a neurodevelopmental disorder characterized by impaired social interaction, verbal and non-verbal communication, and restricted and repetitive behavior. Parents usually notice signs in the first two years of their child's life. These signs often develop gradually, though some children with autism reach their developmental milestones at a normal pace and then regress. The diagnostic criteria require that symptoms become apparent in early childhood, typically before age three.”

### Speech Disabilities

Speech disorders can range from mild slurred speech to the complete inability to move the mouth to speak. The ability to physically speak may be completely unrelated to the person's language capabilities, in the sense that the person may be able to read, write, and understand language, even if the person's mouth structure or neuromuscular connections do not allow the person to articulate words with the mouth. Speech disorders may be caused by or a side-effect of underlying disabilities. A person's speech may improve, may remain stable, or may progressively get worse over time. Individuals born with Cerebral Palsy may be able to improve speech capabilities to a point where they are stable over their life-time. Yet, their language capabilities in the written word may progressively improve with instruction to a point where the individual becomes an exceptional writer.

With some disabilities, Autism Spectrum and specific Speech-Language disabilities, the individual may learn scripts or mimic others and thereby can function quite normally in some social situations. On a computer, with assistive technology and enough time, the individual may be able to function and succeed independently.

ALS, Parkinson’s, MS and Alzheimer’s disease are only a few of many conditions which may cause a person’s ability to speak or perform tasks involving language to deteriorate over time. The impacts of this deterioration can be devastating. Programs like word prediction and auto- complete searches can be used to extend the individual’s abilities. Assistive Technology such as screen pointers, sip and puff controls can also be used as the disease progresses to help the individual communicate and interact in their environment.

#### Speech and Language: Examples of Assistive Technologies and Adaptive Strategies

|  |  |  |
| --- | --- | --- |
| **Domain** | **Challenges** | **Solutions** |
| ICT | Often require repeated exposure to content before long-term memory processing and comprehension takes place | Screen readers can read interfaces and content out loud to users by converting digital text to synthesized speech, but only if they have been designed to be accessible. Users can adjust rate of speech; vary voice and pitch for repeated yet varied exposure to content. May be granted additional time to complete tasks |
| ICT | Cannot use screen readers on digital content and interfaces not designed with accessibility in mind | Interface designers and content authors can edit the markup to make it compatible with the assistive technologies used by those with Speech and Language disabilities  May be granted additional time to complete tasks |
| ICT | May have difficulty writing understandable text | May use programs with writing templates, organizational tools, word prediction and spell checkers.  May use speech-to-text programs  May be granted additional time to complete tasks |

* + **No Speech**

**ASHA:** [Child Speech and Language](http://www.asha.org/public/speech/disorders/ChildSandL.htm) Vocal Disorders: [About Vocal Disorders](http://vocaldisorders.org/about/)

Wikipedia: [Speech Disorders](https://en.wikipedia.org/wiki/Speech_disorder)

Speech disorders or speech impediments are a type of communication disorder where 'normal' speech is disrupted. This can mean stuttering, lisps, etc. Someone who is unable to speak due to a speech disorder is considered mute.

Classification

Classifying speech into normal and disordered is more problematic than it first seems. By a strict classification, only 5% to 10% of the population has a completely normal manner of speaking (with respect to all parameters) and healthy voice; all others suffer from one disorder or another.

There are three different levels of classification when determining the magnitude and type of a speech disorder and the proper treatment or therapy: [2]

1. Sounds the patient can produce
   1. Phonemic – can be produced easily; used meaningfully and constructively
   2. Phonetic – produced only upon request; not used consistently, meaningfully, or constructively; not used in connected speech
2. Stimulate sounds
   1. Easily stimulated
   2. Stimulate after demonstration and probing (i.e. with a tongue depressor)
3. Cannot produce the sound
   1. Cannot be produced voluntarily
   2. No production ever observed”

#### Articulation

Aphasia.org: [Aphasia Definitions](http://www.aphasia.org/aphasia-definitions/)

“Aphasia is an impairment of language, affecting the production or comprehension of speech and the ability to read or write. Aphasia is always due to injury to the brain-most commonly from a stroke, particularly in older individuals. But brain injuries resulting in aphasia may also arise from head trauma, from brain tumors, or from infections.”

ASCD,org: [Confronting the Puzzle of Nonverbal Learning Disabilities](http://www.ascd.org/publications/educational-leadership/nov01/vol59/num03/Confronting-the-Puzzle-of-Nonverbal-Learning-Disabilities.aspx)

“As with most learning disabilities and neurological disorders, nonverbal learning disabilities cover a broad continuum from mild to severe, with no two students showing identical behaviors. In its most severe form, the functional presentation of the disorder is virtually indistinguishable from Asperger's syndrome and high-functioning autism. It is the student with a milder form who may be perplexing to school personnel. Lacking an understanding of the disorder, they may see a student who is extremely capable in some ways and extremely difficult in others. Teachers may believe initially that the student is purposefully controlling, stubborn, or emotionally disturbed. Behaviors may easily be misinterpreted as oppositional, mean-spirited, and sarcastic. Ironically, students with a nonverbal learning disability have deficits in the very areas that would make sarcasm possible, and they do not have the type and breadth of knowledge expected of students their age. Because they have so many experiences in which others respond to them in ways that do not make sense to them, they have learned to live with and to expect disconnection. In turn, they frequently give responses that make no sense.

Characteristics

The impairments related to a nonverbal learning disability manifest themselves in seven main categories of deficits:

* + Visual-spatial—difficulty with visual-spatial organization, perception, and imaging;
  + Cognitive processing—difficulty understanding connections between and among independent factors and relating these to the whole; difficulty understanding the "big picture";
  + Language—flat tone of voice; difficulty understanding humor, multiple meanings of words, and nuances of language;
  + Motor—lack of coordination and small-motor skills related to handwriting;
  + Social—deficits in social understanding;
  + Behavioral—rigid behavior; difficulty with novelty and transition; and
  + Emotional—at high risk for anxiety disorder, panic attack, obsessive-compulsive disorder, and, in some cases, suicide.”

### Seizures

#### Photosensitive

Merck Manuals: [Seizure Disorders](https://www.merckmanuals.com/home/brain%2C-spinal-cord%2C-and-nerve-disorders/seizure-disorders/seizure-disorders)

Rarely, seizures are triggered by repetitive sounds, flashing lights, video games, or even touching certain parts of the body. In such cases, the disorder is called reflex epilepsy.

Epilepsy Foundation: [Photosensitivity and Seizures](http://www.epilepsy.com/learn/triggers-seizures/photosensitivity-and-seizures)

For about 3 percent of people with epilepsy, exposure to flashing lights at certain intensities or to certain visual patterns can trigger seizures. This condition is known as photosensitive epilepsy.

Epilepsy Society: [Photosensitive epilepsy](https://www.epilepsysociety.org.uk/photosensitive-epilepsy)

“Photosensitive epilepsy is when seizures are triggered by flashing lights or contrasting light and dark patterns. Photosensitive epilepsy is not common but it may be diagnosed when you have [an EEG test.](http://www.epilepsysociety.org.uk/electroencephalogram-eeg) Flashing or patterned effects can make people with or without epilepsy feel disorientated, uncomfortable or unwell. This does not necessarily mean they have photosensitive epilepsy.”

#### General Seizure Disorders

Merck Manuals: [Seizure Disorders](https://www.merckmanuals.com/home/brain%2C-spinal-cord%2C-and-nerve-disorders/seizure-disorders/seizure-disorders)

“In seizure disorders, the brain's electrical activity is periodically disturbed, resulting in some degree of temporary brain dysfunction.

* + - Many people have unusual sensations just before a seizure starts.
    - Some seizures cause uncontrollable shaking and loss of consciousness, but more often, people simply stop moving or become unaware of what is happening.
    - Doctors suspect the diagnosis based on symptoms, but imaging of the brain, blood tests, and electroencephalography (to record the brain’s electrical activity) are usually needed to identify the cause.
    - If needed, drugs can usually help prevent seizures.

Normal brain function requires an orderly, organized, coordinated discharge of electrical impulses. Electrical impulses enable the brain to communicate with the spinal cord, nerves, and muscles as well as within itself. Seizures may result when the brain’s electrical activity is disrupted.

There are two basic types of seizures:

* + - Epileptic: These seizures have no apparent cause (or trigger) and occur repeatedly. These seizures are called a seizure disorder or epilepsy.
    - Nonepileptic: These seizures are triggered (provoked) by a disorder or another condition that irritates the brain. In children, a fever can trigger a nonepileptic seizure (called a febrile seizure—see Febrile Seizures).

Certain mental disorders can cause symptoms that resemble seizures, called psychogenic nonepileptic seizures.

About 2% of adults have a seizure at some time during their life. Two thirds of these people never have another one. Seizure disorders commonly begin in early childhood or in late adulthood.”

Mayo Clinic: [Epilepsy Symptoms and Causes](http://www.mayoclinic.org/diseases-conditions/epilepsy/symptoms-causes/dxc-20117207)

“Doctors generally classify seizures as either focal or generalized, based on how the abnormal brain activity begins.

**Focal seizures**

When seizures appear to result from abnormal activity in just one area of your brain, they're called focal (partial) seizures. These seizures fall into two categories.

* + - Focal seizures without loss of consciousness (simple partial seizures). These seizures don't cause a loss of consciousness. They may alter emotions or change the way things look, smell, feel, taste or sound. They may also result in involuntary jerking of a body part, such as an arm or leg, and spontaneous sensory symptoms such as tingling, dizziness and flashing lights.
    - Focal dyscognitive seizures (complex partial seizures). These seizures involve a change or loss of consciousness or awareness. During a complex partial seizure, you may stare into

space and not respond normally to your environment or perform repetitive movements, such as hand rubbing, chewing, swallowing or walking in circles.

Symptoms of focal seizures may be confused with other neurological disorders, such as migraine, narcolepsy or mental illness. A thorough examination and testing are needed to distinguish epilepsy from other disorders.

**Generalized seizures**

Seizures that appear to involve all areas of the brain are called generalized seizures. Six types of generalized seizures exist.

* + - Absence seizures. Absence seizures, previously known as petit mal seizures, often occur in children and are characterized by staring into space or subtle body movements such as eye blinking or lip smacking. These seizures may occur in clusters and cause a brief loss of awareness.
    - Tonic seizures. Tonic seizures cause stiffening of your muscles. These seizures usually affect muscles in your back, arms and legs and may cause you to fall to the ground.
    - Atonic seizures. Atonic seizures, also known as drop seizures, cause a loss of muscle control, which may cause you to suddenly collapse or fall down.
    - Clonic seizures. Clonic seizures are associated with repeated or rhythmic, jerking muscle movements. These seizures usually affect the neck, face and arms.
    - Myoclonic seizures. Myoclonic seizures usually appear as sudden brief jerks or twitches of your arms and legs.

Tonic-clonic seizures. Tonic-clonic seizures, previously known as grand mal seizures, are the most dramatic type of epileptic seizure and can cause an abrupt loss of consciousness, body stiffening and shaking, and sometimes loss of bladder control or biting your tongue.

### Psychological or Psychiatric Disabilities

#### Social Disabilities

(see B5. Autism Spectrum Disorder)

#### Emotional Disabilities

Center for Parent Information and Resources: [Emotional Disturbance (NICHCY)](http://www.parentcenterhub.org/repository/emotionaldisturbance/)

“IDEA defines emotional disturbance as:

‘…a condition exhibiting one or more of the following characteristics over a long period of time and to a marked degree that adversely affects a child’s educational performance:

1. An inability to learn that cannot be explained by intellectual, sensory, or health factors.
2. An inability to build or maintain satisfactory interpersonal relationships with peers and teachers.
3. Inappropriate types of behavior or feelings under normal circumstances.
4. A general pervasive mood of unhappiness or depression.
5. A tendency to develop physical symptoms or fears associated with personal or school problems.’

As defined by IDEA, emotional disturbance includes schizophrenia but does not apply to children who are socially maladjusted, unless it is determined that they have an emotional disturbance.”

Special Educational Needs: [Emotional & Behavioural Difficulties](https://www.specialeducationalneeds.co.uk/emotional--behavioural-difficulties-ebd.html)

“‘EBD’ stands for Emotional Behavioural Disorder (often referred to as 'Emotional and Behavioural Difficulties) and refers to a condition in which behaviour or emotional responses of an individual are so different from generally accepted norms, that they adversely affect that child's performance. The term EBD is a broad term often used to group a range of more specific difficulties such as behaviour which interferes with a child's own learning or the learning of their peers.

EBD is generally a specific diagnosis where the child displays persistent and severe behaviours. It can also be referred to as 'Social, Emotional and Behavioural Difficulties' (SEBD).

Due to the potential emotional difficulties or disturbance, children with EBD may refuse or unsuccessfully be able to utilise educational opportunities offered to them and are therefore potentially difficult or challenging to manage. Often due to the fact that the child’s brain receives and processes information differently than a child who does not suffer from EBD.”

#### Behavioral Disabilities

PsychGuides: [Behavioral Disorder Symptoms, Causes and Effects](http://www.psychguides.com/guides/behavioral-disorder-symptoms-causes-and-effects/)

Behavioral disorders, also known as disruptive behavioral disorders, are the most common reasons that parents take their children for mental health assessments and treatment.

Behavioral disorders are also common in adults. If left untreated in childhood, these disorders can negatively affect a person’s ability to hold a job and maintain relationships.

What Are the Types of Behavioral Disorders?

According to BehaviorDisorder.org, behavioral disorders may be broken down into a few types, which include:

* + 1. Anxiety disorders
    2. Disruptive behavioral disorders
    3. Dissociative disorders
    4. Emotional disorders
    5. Pervasive developmental disorders

Wikipedia: [Emotional and behavioral disorders](https://en.wikipedia.org/wiki/Emotional_and_behavioral_disorders)

“Emotional and behavioral disorders (EBD; sometimes called emotional disturbance or serious emotional disturbance) refer to a disability classification used in educational settings that allows educational institutions to provide special education and related services to students that have poor social or academic adjustment that cannot be better explained by biological abnormalities or a developmental disability.

The classification is often given to students that need individualized behavior supports to receive a free and appropriate public education, but would not be eligible for an individualized education program under another disability category of the Individuals with Disabilities Education Act (IDEA).”

Wikipedia: [Emotional and/or behavioral disability](https://en.wikipedia.org/wiki/Emotional_and/or_behavioral_disability)

“An emotional and/or behavioral disability is a disability that impacts a person's ability to effectively recognize, interpret, control, and express fundamental emotions. The Individuals with Disabilities Education Act of 2004 characterizes the group of disabilities as Emotional Disturbance (ED). This term is controversial as it is seen by some as excluding or even discriminating students with behavior issues and just focuses on the emotional aspects.”

### Multiple/Compound Disabilities

Special Education Guide: [Multiple Disabilities](http://www.specialeducationguide.com/disability-profiles/multiple-disabilities/)

According to the Individuals with Disabilities Education Act’s (IDEA), multiple disabilities refers to “...simultaneous impairments (such as intellectual disability-blindness, intellectual disability- orthopedic impairment, etc.), the combination of which causes such severe educational needs that they cannot be accommodated in a special education program solely for one of the impairments...In other words, a student whose special needs are categorized under multiple disabilities requires coinciding adaptions for more than one disability. The exception is the combination deafness and blindness, as this pair of impairments has its own classification under IDEA.”

Wikipedia: [Comorbidity](https://en.wikipedia.org/wiki/Comorbidity)

“Comorbidity is a term commonly used with psychological and psychiatric disabilities. The term can indicate either a condition existing simultaneously but independently with another condition or a related ... condition.”

NCBI: <http://www.ncbi.nlm.nih.gov/pubmed/10795606>

“Posttraumatic stress disorder (PTSD) commonly co-occurs with other psychiatric disorders. Data from epidemiologic surveys indicate that the vast majority of individuals with PTSD meet criteria for at least one other psychiatric disorder, and a substantial percentage have 3 or more other psychiatric diagnoses.”

Wikipedia: [Conditions comorbid to autism spectrum disorders](https://en.wikipedia.org/wiki/Conditions_comorbid_to_autism_spectrum_disorders)

“Autism spectrum disorders (ASD), including Asperger syndrome, are developmental disorders that begin in early childhood, persist throughout adulthood, and affect three crucial areas of development: communication, social interaction and restricted patterns of behavior. There are many conditions comorbid to autism spectrum disorders such as fragile X syndrome and epilepsy.

In medicine and in psychiatry, comorbidity is the presence of one or more additional conditions co-occurring with the primary one, or the effect of such additional disorders. About 10–15% of autism cases have an identifiable Mendelian (single-gene) condition, chromosome abnormality, or other genetic syndrome and ASD is associated with several genetic disorders, perhaps due to an overlap in genetic causes.

Distinguishing between ASDs and other diagnoses can be challenging because the traits of ASDs often overlap with symptoms of other disorders and the characteristics of ASDs make traditional diagnostic procedures difficult.”

About Kids Health: [Comorbidity](http://www.aboutkidshealth.ca/En/ResourceCentres/ADHD/Diagnosis/Pages/Comorbidity.aspx)

“When a person has more than one disease or health condition at the same time, this is called comorbidity. Comorbid conditions may be related:

* One condition may cause another condition.
* An underlying cause may make the person vulnerable to both conditions.   
    
  Comorbid conditions may also happen without being related.

Studies have shown high rates of comorbid conditions among children with ADHD, including anxiety, depression, Tourette’s syndrome, oppositional defiant disorder, conduct disorder, and learning disabilities.”

Exceptional Children: [Children with Severe and Multiple Disabilities](http://home.mindspring.com/%7Eamstevens/exceptionalchildren/id23.html)

“People with severe or multiple disabilities may exhibit a wide range of characteristics, depending on the combination and severity of disabilities, and the person's age. There are, however, some traits they may share, including:

* Limited speech or communication;
* Difficulty in basic physical mobility;
* Tendency to forget skills through disuse;
* Trouble generalizing skills from one situation to another; and/or
* A need for support in major life activities (e.g., domestic, leisure, community use, vocational).”

MenCap: [Children and adults with profound and multiple learning disabilities (PMLD)](https://www.mencap.org.uk/about-learning-disability/about-learning-disability/profound-and-multiple-learning-disabilities-pmld)

“People with profound and multiple learning disabilities:

* have more than one disability
* have a profound learning disability
* have great difficulty communicating
* need high levels of support with most aspects of daily life
* may have additional sensory or physical disabilities, complex health needs or mental health difficulties
* may have behaviours that challenge us.”

### Resources

NCBI: [Comorbidity of psychiatric disorders and posttraumatic stress disorder.](http://www.ncbi.nlm.nih.gov/pubmed/10795606) Wikipedia: [Conditions comorbid to autism spectrum disorders](https://en.wikipedia.org/wiki/Conditions_comorbid_to_autism_spectrum_disorders)

About Kids Health: [Comorbidity](http://www.aboutkidshealth.ca/En/ResourceCentres/ADHD/Diagnosis/Pages/Comorbidity.aspx)

MenCap: [Children and adults with profound and multiple learning disabilities (PMLD)](https://www.mencap.org.uk/about-learning-disability/about-learning-disability/profound-and-multiple-learning-disabilities-pmld)

## Assistive Technologies and Adaptive Strategies at the Level of the Individual for Permanent, Temporary, and Episodic Disabilities (ICT and Physical World)

Cornell University Law School: [Assistive technology device - 20 U.S.C. 1401 Definitions](https://www.law.cornell.edu/uscode/text/20/1401) NIH: [What are some types of assistive devices & how are they used?](https://www.nichd.nih.gov/health/topics/rehabtech/conditioninfo/Pages/device.aspx)

### Visual Disabilities Assistive Technologies

#### Resources:

* + World Blind Union: [www.worldblindunion.org](http://www.worldblindunion.org/)
  + Euro Blind Union : [www.wuroblind.org](http://www.wuroblind.org/)
  + National Federation of the Blind: [www.nfb.org](http://www.nfb.org/)
  + American Foundation for the Blind: [www.afb.org](http://www.afb.org/)
  + Royal National Institute of Blind People; [www.rnib.org](http://www.rnib.org.uk/)
  + Royal New Zealand Foundation of the Blind; [www.blindfoundation.org](http://www.blindfoundation.org/)
  + Spain Once Foundation : [www.once.es](http://www.once.es/)
  + World access for the blind:[www.wafrb.org](http://www.wafrb.org/)

#### Blindness

**ICT**

* + 1. Input (e.g., braille keyboard, speech input, standard keyboard, gestures)
    2. Output (e.g., screen reader voice output, screen reader refreshable braille output, haptic alerts and feedback)

**Physical World (e.g., cane, service animals, navigation aids, tactile markers, braille)**

#### Low vision

**ICT**

* + 1. Input (e.g., large printed letters on keyboard, magnified pointers and cursors, standard keyboard/mouse/touch)
    2. Output (e.g., screen magnification, color and contrast controls, large display monitor or projector, screen magnification)  
        **Physical World (e.g., vision correction, large print, tactile markers)**

#### Colorblindness

**ICT**

* + 1. Input (e.g., standard keyboard/mouse/touch)
    2. Output (e.g., color/contrast adjusting software)

**Physical World (e.g., standard/consistent physical positioning and visual presentation, visual filters)**

### Deafblindness Assistive Technology and Adaptive Strategies Resources

* + DeafBlind International: [www.deafblindinternational.org](http://www.deafblindinternational.org/)
  + World Federation of the Deaf/Blind: [www.wfdb.com](http://www.wfdb.com/)
  + Canadian National Society of the deaf/blind: [www.deafblindcanada.ca](http://www.deafblindcanada.ca/)
  + The American Association of the Deaf/blind: [www.aadb.org](http://www.aadb.org/)
  + Deaf/blind communication technology: [www.nfb.org/deaf/blind](http://www.nfb.org/deaf/blind)

**ICT**

1. Input (e.g., braille, standard keyboard/touch, voice)
2. Output (e.g., screen reader refreshable braille output, haptic alerts and feedback)

**Physical World (e.g., cane, service animals, navigation aids, tactile marking/sign, tactile sign language, braille, deafblind communicator)**

### Auditory Disabilities Assistive Technology and Adaptive Strategies Resources

* + Learning Disabilities Association of America: <https://ldaamerica.org/>
  + The world’s leading website on learning disabilities and ADHD: [www.ldonline.org](http://www.ldonline.org/)
  + The Auditory Disorder Foundation: [www.adfoundation.org](http://www.adfoundation.org/)
  + Understood. [www.understood.org](http://www.understood.org)
  + Auditory Processing help home-based program: [www.gemmlearning.com](http://www.gemmlearning.com/)
  + Learning Disability America: [www.ldaamerica.org](http://www.ldaamerica.org/)
  + WebAim: [www.webaim.org](http://www.webaim.org/)
  + The Able kids foundation: [www.ablekidsfundation.org](http://www.ablekidsfundation.org/)
  + Australia Hearing: [www.hearing.com](http://www.hearing.com/) and [www.spdaustralia.com](http://www.spdaustralia.com/) and  [https://capd.nal.gov.au/](%20https://capd.nal.gov.au/)
  + New Zealand: [www.nfd.org](http://www.nfd.org/)
  + Directory of auditory processing disorder (APD) [www.asha.org](http://www.asha.org/)
  + Auditory Processing special World: [www.specialworld.net](http://www.specialworld.net/)
  + Canada: [www.ementalhealth.ca](http://www.ementalhealth.ca/)
  + Asia: [www.udemy.com](http://www.udemy.com/)

#### Deafness

**ICT**

* 1. Input (e.g., keyboard, video conferencing for signing, teletype)
  2. Output (e.g., captions, sign language, text transcript, haptic alerts/feedback)

**Physical World (e.g., visual labels/notifications/alerts, sign language interpretation)**

#### Hard-of-Hearing

**ICT**

* + 1. Input (e.g., keyboard, video conferencing for signing, teletype)
    2. Output (e.g., captions, audio controls, haptic alerts/feedback)

**Physical World (e.g., visual labels/notifications/alerts, assistive listening devices, voice carryover)**

### Mobility and Dexterity Disabilities Assistive Technologies and Adaptive Strategies

**ICT**

a. Input (e.g., switch devices, ergonomic concerns, adaptive keyboards, voice control, alternative pointing devices)

b. Output (e.g., ergonomic concerns, adjustable position displays, timing controls)

**Physical World (e.g., wheelchair, ergonomic design of consumer and industrial products, architectural design)**

### Cognitive Disabilities Assistive Technologies and Adaptive Strategies

**ICT**

* 1. Input (e.g., word prediction/lookup, simplified interface, AAC)
  2. Output (e.g., synchronized speech and highlighting, AAC, simplified content and/or interface)

**Physical World (e.g., simplified environmental design/control, visual and/or audio alternatives to text in signage/messages/instructions, direct and immediate help and feedback mechanisms)**

### Speech Disabilities Assistive Technologies and Adaptive Strategies

**Resources**

University of Canterbury: [www.cmds.canterbury.ac.nz](http://www.cmds.canterbury.ac.nz/)

**ICT**

1. Input (e.g., standard non-speech inputs, articulation aids)
2. Output (e.g., AAC)

**Physical World (e.g., voice carryover, text-based alternatives to speech for communication)**

### Seizure Disabilities Assistive Technologies and Adaptive Strategies

**ICT**

* 1. Input (e.g., standard inputs)
  2. Output (e.g., standard outputs, animation controls)

**Physical World (e.g., service animals, emergency call-out device)**

### Multiple/Compound Disabilities Assistive Technologies and Adaptive Strategies

**ICT**

* 1. Input (dependent on combination of disabilities)
  2. Output (dependent on combination of disabilities)

**Physical World (dependent on combination of disabilities)**

1. **Disability Demographics and Statistics**

Recommended study tasks:  
Become familiar with the average percent of populations living with disabilities in various regions around the world

### Resources

* Disabled World: [Disability Statistics](https://www.disabled-world.com/disability/statistics/)
* Cornell University: [Disability Statistics - 2015](https://www.disabilitystatistics.org/)
* United Nations: [Human functioning and disability](https://unstats.un.org/unsd/demographic/sconcerns/disability/disab2.asp)
* Eurostat: [Disability statistics - Nov 2015](http://ec.europa.eu/eurostat/statistics-explained/index.php/Disability_statistics)
* Statistics Canada: [Canadian Survey on Disability, 2012](http://www.statcan.gc.ca/daily-quotidien/131203/dq131203a-eng.htm)

## Disability Etiquette

Recommended study tasks:

Apply disability etiquette to a specific scenario.

Judge the appropriateness of various ways of referring to or about people with disabilities

### Resources

* United Cerebral Palsy: [Disability Etiquette](http://ucp.org/resources/disability-etiquette/)
* University of Cambridge: [Etiquette](https://www.disability.admin.cam.ac.uk/about-drc/etiquette)
* Independence Australia: [A-Z of disability etiquette](https://www.independenceaustralia.com/a-z)

# Accessibility and Universal Design

## Individual Accommodations versus Inclusive Design

University of Cambridge Inclusive Toolkit: [What is inclusive design?](http://www.inclusivedesigntoolkit.com/whatis/whatis.html)

Norsk Design: [Inclusive Design - a people centered strategy for innovation](http://www.inclusivedesign.no/)

OCAD University Inclusive Design Research Center: [What is Inclusive Design?](http://idrc.ocadu.ca/about-the-idrc/49-resources/online-resources/articles-and-papers/443-whatisinclusivedesign)

Designing Buildings Wiki, UK: [Inclusive design](https://www.designingbuildings.co.uk/wiki/Inclusive_design#Inclusive_design)

US Department of Labor: [Accommodations](https://www.dol.gov/odep/topics/Accommodations.htm) UW Do-It: [Accommodation Model](http://www.washington.edu/doit/accommodation-model)

Cerritos College: [What are Accommodations?](https://cms.cerritos.edu/dsps/what-are-accommodations.htm)

Canadian Hearing Society: [Determining your accommodation needs](http://www.chs.ca/determining-your-accommodation-needs)

## Benefits of Accessibility

### Benefits for People with Disabilities and their Families

Council of Canadians with Disabilities: [Building an Inclusive and Accessible Canada: Supporting](http://www.ccdonline.ca/en/socialpolicy/actionplan/accessible-canada)  [People with Disabilities](http://www.ccdonline.ca/en/socialpolicy/actionplan/accessible-canada)

Australian Government: [SHUT OUT: The Experience of People with Disabilities and their](https://www.dss.gov.au/our-responsibilities/disability-and-carers/publications-articles/policy-research/shut-out-the-experience-of-people-with-disabilities-and-their-families-in-australia?HTML&amp;2.3.3)  [Families in Australia](https://www.dss.gov.au/our-responsibilities/disability-and-carers/publications-articles/policy-research/shut-out-the-experience-of-people-with-disabilities-and-their-families-in-australia?HTML&amp;2.3.3)

The Better India: [16 Famous Indians With Disabilities Who Inspire Us Everyday](http://www.thebetterindia.com/16449/famous-indians-with-disability/) Wallet Hub: [2016’s Best & Worst Cities for People with Disabilities](https://wallethub.com/edu/best-worst-cities-for-people-with-disabilities/7164/)

[Sweden’s disability policy](https://sweden.se/society/swedens-disability-policy/)

Disability Rights Education and Defense Fund: [Achieving Accessibility: How the Americans with](https://dredf.org/international/paper_y-g.html)  [Disabilities Act](https://dredf.org/international/paper_y-g.html)

### Benefits for Society

OHAC: [The main benefits of improving accessibility and how accessibility benefits society](http://www.accessconsultancy.ie/Main-benefits-improving-accessibility-how-accessibility-benefitssociety) Global Public Inclusive Infrastructure (GPII) : [Benefits to Society](http://gpii.net/societybenefits)

ISEMOA: [BENEFITS OF IMPROVING ACCESSIBILITY](https://www.google.com/url?sa=t&amp;rct=j&amp;q&amp;esrc=s&amp;source=web&amp;cd=3&amp;cad=rja&amp;uact=8&amp;ved=0ahUKEwjF-_7l2u_SAhVmjFQKHVzlCHMQFggrMAI&amp;url=http%3A%2F%2Fwww.isemoa.eu%2Fdocs%2F42%2FISEMOA_benefit_brochure_EN_120502_final.pdf&amp;usg=AFQjCNFh_nPg4eSRVskdryxNsC71BOzvYA&amp;sig2=EXkuLjPJLHHG7Xv0OCkrHA)

### Benefits for Businesses

W3C: [Business Case Overview](https://www.w3.org/WAI/bcase/Overview.html)

UC Berkeley: [Benefits of Web Accessibility](https://webaccess.berkeley.edu/web-accessibility-uc/benefits)

## Accessibility Principles for ICT (WCAG 2.0)

**Recommended study tasks:** Define the term *accessibility*.

* 1. Perceivable
  2. Operable
  3. Understandable
  4. Robust **Resources**

W3C: [Understanding WCAG 2.0 Intro](https://www.w3.org/TR/UNDERSTANDING-WCAG20/intro.html) W3C: [Understanding WCAG 2.0](https://www.w3.org/TR/UNDERSTANDING-WCAG20/)

## Accessibility Principles for the Physical World (Universal Design 2.0)

Authors: Bettye Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mullick, Elaine Ostroff, Jon Sanford, Ed Steinfeld, Molly Story, and Gregg Vanderheiden

The Principles of Universal Design are Copyright © 1997 NC State University, [The Center for](http://www.ncsu.edu/ncsu/design/cud/)  [Universal Design.](http://www.ncsu.edu/ncsu/design/cud/)

### Equitable Use

* Provide the same means of use for all users: identical whenever possible; equivalent when not.
* Avoid segregating or stigmatizing any users.
* Provisions for privacy, security, and safety should be equally available to all users.
* Make the design appealing to all users.

### Flexibility in Use

* Provide choice in methods of use.
* Accommodate right- or left-handed access and use.
* Facilitate the user's accuracy and precision.
* Provide adaptability to the user's pace.

### Simple and Intuitive Use

* Eliminate unnecessary complexity.
* Be consistent with user expectations and intuition.
* Accommodate a wide range of literacy and language skills.
* Arrange information consistent with its importance.
* 3e. Provide effective prompting and feedback during and after task completion.

### Perceptible Information

* Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
* Provide adequate contrast between essential information and its surroundings. 4c. Maximize "legibility" of essential information.
* Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
* Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

### Tolerance for Error

* Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
* Provide warnings of hazards and errors.
* Provide fail safe features.
* Discourage unconscious action in tasks that require vigilance.

### Low Physical Effort

* Allow user to maintain a neutral body position
* Use reasonable operating forces.
* Minimize repetitive actions.
* Minimize sustained physical effort.

### Size and Space for Approach and Use

* Provide a clear line of sight to important elements for any seated or standing user
* Make reach to all components comfortable for any seated or standing user.
* Accommodate variations in hand and grip size.
* Provide adequate space for the use of assistive devices or personal assistance.

### Resources

Universal Design: [What is UD?](http://www.universaldesign.com/what-is-ud/) NCSU: [UD Principles](https://www.ncsu.edu/ncsu/design/cud/about_ud/udprinciplestext.htm)

## Universal Design for Learning (UDL)

### Provide Multiple Means of Representation

The focal point of **Principle I: Multiple Means of Representation** is ensuring that different options are utilized when delivering instructional content to learners. Information should be presented to learners in variety of formats that include print, electronic text, visual graphics, and audio. It is important to keep in mind diversity among learners when presenting instructional content. Learners who may have cognitive disabilities or may experience language barriers may benefit from instructional visuals like graphs, charts, and models that reinforce text-based content. However, learners with visual disabilities may miss information if it communicated only in a visual format. Incorporating a variety of delivery formats increase the chances of learners perceiving information presented to them.

The following guidelines can be used as strategies to use multiple means of representation:

* + Present different options for perceiving information.
  + Present different options to support language, mathematical expression, and symbol comprehension.
  + Present different options that support comprehension.

### Provide Multiple Means of Action and Expression

In keeping diversity of learners in mind, **Principle II: Multiple Means of Action and Expression** emphasizes the importance of learners being presented with various options to demonstrate their knowledge. No one specific activity or assessment is going to enable every learner to exhibit their skills. While some learners may be successful demonstrating what they know through traditional assessments like quizzes, other learners may succeed in expressing themselves through authentic assessments like projects. Constructive feedback from instructors can also assist learners in exhibiting newly acquired knowledge as feedback informs them what they need to do demonstrate their skills appropriately.

The guidelines below can be utilized to help learners demonstrate their skills in a variety of ways:

* + Present different options for physical action.
  + Present different options for expression and communication.
  + Present different options for demonstrating executive functions (high-level skills).

### Provide Multiple Means of Engagement

Ensuring learners are able to transform accessible information into useable knowledge is the basis of **Principle III: Provide options for comprehension.** Learners engage in an active process of transforming information into personalized formats that assist with information processing. These personalized formats help users integrate new information with prior knowledge and assist with the assimilation of new knowledge into memory. Ensuring that all learners have access to knowledge begins with proper design and adaptable presentation of the information during the process of curriculum development and instructional design.

The following guidelines can allow learners to find the optimum means of engagement for their preferred mode(s) of learning.

* Provide options for recruiting interest
* Provide options for sustaining effort and persistence
* Provide options for self-regulation

### Resources

UDL Center: [UDL Guidelines](http://www.udlcenter.org/aboutudl/udlguidelines)

## Usability and User Experience (UX)

* Designing and Evaluating Optimal Fitness for Purpose
* Commonalities Between Usability and Accessibility
* Differences Between Usability and Accessibility
* Accessibility Solutions are Equally Effective and Integrated, and Substantially Easy to Use

**Resources**

Usability Geek: [The Difference Between Usability and User Experience](http://usabilitygeek.com/the-difference-between-usability-and-user-experience/)

User Interface Engineering: [The Difference Between Usability and User Experience](https://www.uie.com/brainsparks/2007/03/16/the-difference-between-usability-and-user-experience/) Interaction Design: [Usability: A part of the User Experience](https://www.interaction-design.org/literature/article/usability-a-part-of-the-user-experience)

Jisc: [Usability and user experience](https://www.jisc.ac.uk/guides/usability-and-user-experience)

# Laws, Regulations, Standards, Policies, and Organizational Accessibility Strategies

## International Conventions and Treaties on Disability Rights

Recommended study tasks:

* + Name prominent international documents or agreements related to disability and human rights.
  + Explain the main purposes of each convention or treaty.
  + Explain the relationships between the declarations and treaties.

### The Universal Declaration of Human Rights

"The Universal Declaration of Human Rights (UDHR) is a milestone document in the history of human rights. Drafted by representatives with different legal and cultural backgrounds from all regions of the world, the Declaration was proclaimed by the United Nations General Assembly in Paris on 10 December 1948 General Assembly resolution 217 A (III) (French) (Spanish) as a

common standard of achievements for all peoples and all nations. It sets out, for the first time, fundamental human rights to be universally protected."

* + From the UN website: <http://www.ohchr.org/EN/UDHR/Pages/Introduction.aspx>

Resources on the UN web site:

* + - Home page for the Declaration of Human Rights: <http://www.ohchr.org/EN/UDHR/Pages/Introduction.aspx>
    - Full text of the Declaration of Human Rights (English): <http://www.un.org/en/documents/udhr/>
    - Translations of the Declaration of Human Rights into many languages: <http://www.ohchr.org/EN/UDHR/Pages/SearchByLang.aspx>
    - Wikipedia article about the Declaration of Human Rights:  <https://en.wikipedia.org/wiki/Universal_Declaration_of_Human_Rights>

### Convention on the Rights of Persons with Disabilities

"The Convention on the Rights of Persons with Disabilities and its Optional Protocol (A/RES/61/106) was adopted on 13 December 2006 at the United Nations Headquarters in New York, and was opened for signature on 30 March 2007... The Convention entered into force on 3 May 2008.

"The Convention follows decades of work by the United Nations to change attitudes and approaches to persons with disabilities. It takes to a new height the movement from viewing persons with disabilities as "objects" of charity, medical treatment and social protection towards viewing persons with disabilities as "subjects" with rights, who are capable of claiming those rights and making decisions for their lives based on their free and informed consent as well as being active members of society.

"The Convention is intended as a human rights instrument with an explicit, social development dimension. It adopts a broad categorization of persons with disabilities and reaffirms that all persons with all types of disabilities must enjoy all human rights and fundamental freedoms. It clarifies and qualifies how all categories of rights apply to persons with disabilities and identifies areas where adaptations have to be made for persons with disabilities to effectively exercise their rights and areas where their rights have been violated, and where protection of rights must be reinforced.

"The Convention was negotiated during eight sessions of an Ad Hoc Committee of the General Assembly from 2002 to 2006, making it the fastest negotiated human rights treaty.

From the UN website: <http://www.un.org/disabilities/default.asp?id=150>

Resources on the United Nations website: [Home page of the UN "Enable" initiative](http://www.un.org/disabilities/)

[Convention home page, with summary and links to full text in several languages](http://www.un.org/disabilities/default.asp?navid=15&amp;pid=150)  [Full text of the Convention (English)](http://www.un.org/disabilities/convention/conventionfull.shtml)

[Wikipedia article about the Convention](https://en.wikipedia.org/wiki/Convention_on_the_Rights_of_Persons_with_Disabilities)

* + 1. The Marrakesh Treaty to Facilitate Access to Published Works for Persons who are Blind, Visually Impaired, or Otherwise Print Disabled, by the World Intellectual Property Organization (WIPO)

"The Marrakesh Treaty was adopted on June 27, 2013 in Marrakesh and it forms part of the body of international copyright treaties administered by WIPO. It has a clear humanitarian and social development dimension and its main goal is to create a set of mandatory limitations and exceptions for the benefit of the blind, visually impaired, and otherwise print disabled (VIPs)." (from the WIPO website: <http://www.wipo.int/treaties/en/ip/marrakesh/)>

On the WIPO website:

* + - * [Home page about the Marrakesh Treaty](http://www.wipo.int/treaties/en/ip/marrakesh/)
      * [Summary of the Marrakesh Treaty](http://www.wipo.int/treaties/en/ip/marrakesh/summary_marrakesh.html)
      * [Full text of the treaty in multiple languages](http://www.wipo.int/wipolex/en/details.jsp?id=13169)
      * [Wikipedia article on the Marrakesh Treaty](https://en.wikipedia.org/wiki/Marrakesh_VIP_Treaty)

* + - * ["The Treaty of Marrakesh Explained" by the World Blind Union](http://www.worldblindunion.org/english/news/Pages/The-Treaty-of-Marrakesh.aspx)

## Categories of Disability Laws and Regulations

Multi-National Standards and Policies

National Standards and Policies

National and Regional Laws

Civil Rights Laws

Civil rights laws take their cue from the Social Disability Model, and attempt to secure equal rights for people with disabilities by requiring social institutions (governments, corporations, educational institutions, individuals, etc.) to reduce or eliminate discriminatory disabling conditions in society.

Some disability civil rights laws include prescriptive guidelines or checklists for measuring accessibility in such areas as architecture and the built environment, employment and the workplace, educational settings, retail venues, hospitality and entertainment, etc.

In most cases, compliance with civil rights laws is not actively monitored or enforced by government officers. Citizens must file complaints, which then may go to court or may be settled out of court.

Examples of civil rights laws for people with disabilities include: [The Americans with Disabilities Act of 1990 (USA)](https://adata.org/learn-about-ada)

[The Equality Act of 2010 (UK)](https://www.gov.uk/guidance/equality-act-2010-guidance)

Procurement Laws

Procurement laws address disabilities at the point of purchase by ensuring that products and services meet accessibility standards.

Examples of disability-related procurement laws include:

* + - * Section 508 of the Rehabilitation Act (USA)
      * [EN 301 549 "Accessibility requirements for public procurement of ICT products and services in Europe" (EU)](http://mandate376.standards.eu/standard)

Domain-Specific Laws and Regulations

* + - * Some laws target specific technologies or specific domains of the economy. Examples of domain-specific laws include:
      * [21st Century Communications and Video Accessibility Act (CVAA) (U.S.)](https://www.fcc.gov/guides/21st-century-communications-and-video-accessibility-act-2010)
      * [Air Carrier Access Act (U.S.)](http://airconsumer.dot.gov/rules/382short.pdf)

## Applying Accessibility Standards and Regulations

## Integrating Accessibility Across Your Organization

### Management Champions

* + - * Vision, Leadership, and Strategy Alignment
      * Ongoing Commitment and Sustainability
      * Accessibility projects versus accessibility programs versus integral accessibility throughout all projects and programs.
      * Cross-Disciplinary Awareness, Collaboration, and Implementation
      * Performance/Capability Maturity Model

### Accessibility: An Organization-wide Process Not A Project

* + - * Innovating for Accessibility
      * Planning for Accessibility
      * Retrofitting for Accessibility
      * Maintaining Accessibility
    1. **Integrating QA Throughout Your Accessibility Review Process**
       - Fitness for Purpose: Strategic Alignment and Assessment
       - Reusable Design/Code Libraries
       - Quality Assurance Tools, Methods, and Protocols
       - Formative, Summative, and Continuous Evaluations
       - Expert Analysis and Consultation

### Recruiting, Hiring, & Accessibility Competencies

* + - * Recruiting and Integrating Employees with Disabilities
      * Recruiting Accessibility Talent
      * Workforce Development and Training
      * Accessibility-Related Roles, Responsibilities, and Competencies

### Communication Management Strategies

* Removing barriers and ensure inclusive communications to both internal and external audiences
* Integrating accessibility communications standards
* Ongoing training for people first and plain language
* Ensuring accessible digital platforms and applications
* Delivering accessible documents
* Providing captioned and described time-based media
* Utilize accessible data gathering tools
* Understanding assistive technologies and how they are utilized
* Taking advantage of the increased learning, influence, and potential that accessible communications provide to all audiences

### Legal & PR Implications

Assessing Legal Liability

The scope of the legal liability of laws can vary widely, including the following:

National government(s):

* [Basic Law for Persons with Disabilities](http://www8.cao.go.jp/shougai/english/law/no84.html) (Japan)
* [Discrimination Act of 2009](http://www.government.se/contentassets/6732121a2cb54ee3b21da9c628b6bdc7/oversattning-diskrimineringslagen_eng.pdf) (Sweden)
* [Section 508 of the Rehabilitation Act](https://www.section508.gov/content/learn/laws-and-policies) (USA)

State or provincial government:

* [Ontarians with Disabilities Act](https://www.ontario.ca/laws/statute/01o32) (Ontario, Canada)

International:

* [Convention on the Rights of Persons with Disabilities](https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html) (United Nations)
* [EN 301 549](http://mandate376.standards.eu/standard) "Accessibility requirements for public procurement of ICT products and services in Europe" (EU)
* [The Standard Rules on the Equalization of Opportunities for Persons with Disabilities](http://www.un.org/esa/socdev/enable/dissre00.htm) (United Nations)

Businesses and other similar "places of public accommodation:"

* [Americans with Disabilities Act Title III](https://www.ada.gov/regs2010/titleIII_2010/titleIII_2010_withbold.htm) (USA)
* [Americans with Disabilities Act Public Accommodations Q&A](https://adata.org/publication/ADA-faq-booklet#Public Accommodations) (USA)

Specific business sectors (such as airlines, telecommunications, architecture, etc.):

* [Civil Aviation Authority](https://www.caa.co.uk/Passengers/PRM/Passengers-with-disabilities-and-reduced-mobility/) (UK)
* [U.S. Department of Transportation Air Carrier Access Act](https://www.transportation.gov/airconsumer/passengers-disabilities) (USA)

The Public Relations Implications of Non-Compliance Internal Accountability for Compliance

### Procurement Processes

Verifying Product Accessibility Claims

Requiring Accessible Outcomes in Contractual Agreements Verifying Contractor Accessibility Expertise and Capacity Leveraging Procurement Policies to Influence Third-Party Providers

### Stakeholders and Influencers

Including the perspectives of persons with disabilities in the implementation of accessibility across the organization

* National and local government
* Disability councils and organizations
* Disability service providers
* Input from people with disability via usability research