I'm not a robot

Assistive technologies examples

Assistive technology refers to devices or systems that aid individuals with disabilities in performing tasks that might otherwise be difficult or impossible. It ranges from low-tech solutions like magnifying glasses for reading to high-tech tools like voice recognition software. With the current progress in generative AI technologies from companies like OpenAI, assistive technologies are rapidly advancing, with new disruptive technologies hitting the market weekly. Assistive technology plays a crucial role in promoting inclusivity, as it ensures everyone, regardless of their physical or cognitive abilities, can partake in various life areas. Hearing aids are designed to help improve the hearing of people with hearing loss or other hearing-related difficulties. These compact devices amplify sound waves to make them audible for people with hearing loss. The technology involved processes the environmental sounds and compensates for impaired hearing. Therefore, hearing aids prove instrumental in helping individuals with hearing impairments engage in regular communication and live richer lives. Case Study: The Invention of Cochlear implants Cochlear implants, invented by Graeme Clark, an Australian otolaryngologist, are advanced assistive technologies that transform lives. These devices convert sound waves into electrical signals, which are then sent to the auditory nerve, offering the ability to perceive sound to those with profound hearing loss. Since their establishment in the 1970s, cochlear implants have empowered more than 300,000 individuals worldwide to communicate and interact more effectively. Today, these implants are making significant contributions towards alleviating the impacts of profound hearing loss on people's lives. Screen readers are software applications that convert text into speech. They provide a crucial interface to computers for individuals who are visually impaired or blind, enabling them to access digital content. The screen reader scans the text on the screen and then speaks it out loud, thereby assisting the user in understanding the content. This assists the visually impaired in navigating and interacting with digital devices and platforms. Wheelchairs, in both manual and electronic forms, are fundamental assistive devices for individuals with mobility disabilities. They are designed to facilitate movement for those who find walking impossible or strenuous due to disability or health conditions. Wheelchairs vary widely, designed to suit a range of users' needs, body types, and lifestyle requirements. They exist to promote the independence, confidence, and well-being of those with mobility challenges, thereby positively transforming their quality of life. Case Study: The Invention of Self-Propelling Wheelchairs The first self-propelling chair on wheels was invented by an watchmaker named Stephan Farffler in Germany around 1655. Farffler built a three-wheeled chair that he could propel without assistance. The evolution of the wheelchair from its primitive form to the sophisticated, lightweight, and customizable models of today has greatly enhanced mobility and independence for persons with disabilities. With wheelchairs, individuals who have mobility impairments can lead more active, fulfilling lives – such immense mobility aids help them engage in daily activities, work, and leisure that would have otherwise been challenging. Speech-to-text software converts spoken words into written text. It benefits individuals with learning disabilities, dyslexia, or physical impairments that make typing difficult. The software interprets the spoken language by recognizing spoken patterns, which it then transcribes into text. This innovative technology helps deliver an efficient, hands-free method of writing and communicating. A white cane is a fundamental livelihood tool for the visually impaired. It empowers users to navigate their environment independently by detecting obstacles in their path. The white color effectively signals to others that the person is visually impaired, enhancing their safety by promoting awareness among nearby people or vehicles. Through the simple yet efficient technology of the white cane, visually impaired individuals can traverse their surroundings with enhanced confidence and freedom. See Also: A List of Amazing Technological Innovations Prosthetic limbs replace a missing arm, leg, or other body part. They aid individuals in regaining mobility and functionality after the loss of a natural limb, often due to disease or injury. Modern advancements in prosthetics have resulted in limbs that not only replicate human appearance but mobility as well, some even responding to muscle movements. These revolutionizing developments have equipped amputees with unprecedented abilities to pursue a wide range of physical activities. Case Study: Futuristic Prosthetic Limbs Companies like Open Bionics are making significant strides in the world of prosthetic limbs. They've developed advanced, 3D-printed bionic limbs known as "Hero Arms" that can offer realistic hand movement. The prosthetics, equipped with multiple grip patterns and sensor-driven controls, offer functionality that mimics a naturally occurring limb, including the ability to point and pinch. Users have hailed this innovation as transformative, empowering them to gain newfound independence and unimpeded participation in daily activities. Eyegaze Edge is a wearable technology controlled by eye movement. It allows individuals with severe physical disabilities, such as locked-in syndrome or ALS, to communicate effectively and perform tasks on a computer. The system works by tracking eye movement, allowing users to select letters or icons on a screen by merely looking at them merely looking at them. This technology effectively transforms the person's eye into a mouse cursor, empowering users to work with computer applications, surf the web, or even write and send emails. Eyegaze Edge brings about transformative change by affording a renewed level of independence and communication possibilities to individuals with severe physical restrictions. Braille e-books are electronic versions of print books transcribed into Braille for people with visual impairments. They work by presenting Braille characters electronically on a refreshable Braille display, allowing users to "read" through touch. With an extensive library of books available worldwide in digital Braille, visually impaired individuals can enjoy a wide range of literary works. Therefore, Braille e-books not only promote the literary interest of the visually impaired but also facilitate their access to, and interaction with, valuable information and education. See Also: A List of Communication Technologies AAC devices help people with speech or language issues communicate. These devices can range from simple picture boards to sophisticated computer programs that generate speech. Users interact with these devices by selecting letters or images representing specific words or phrases, which the device then translates into audible speech. This technological aid significantly enhances their communication capability, aiding them in more effectively expressing their thoughts, needs, and desires. Smart home devices like voice-activated lights, thermostats, and door locks provide valuable assistance to individuals with mobility and physical disabilities. Users can control these devices using voice commands or smartphone apps, eliminating the need for physical interaction with the device. Consequently, these devices contribute significantly towards enabling individuals with physical disabilities to lead an independent, comfortable, and safe life within their homes. Reading glasses Screen readers (e.g., JAWS, NVDA) Braille displays Screen magnification software (e.g., ZoomText) Speech recognition software (e.g., Dragon NaturallySpeaking) Closed captioning systems Hearing aids Augmentative and alternative communication (AAC) devices Tactile graphics Video relay services (VRS) Text-to-speech software (e.g., Kurzweil 3000) Eye-tracking systems Switch access devices Sip-and-puff systems Voice output communication aids (VOCA) Refreshable Braille readers Assistive listening devices (e.g., FM systems) Teletypewriter (TTY) devices Large print keyboards Adaptive mice (e.g., trackball, joystick) Environmental control units (ECU) Wheelchair ramp controls Voice-activated home assistants (e.g., Amazon Echo, Google Home) Wearable mobility devices (e.g., exoskeletons) Smart glasses for visual impairment (e.g., OrCam MyEye) Educational environments greatly benefit from the integration of assistive technology. Assistive technologies can promote inclusivity in classrooms by helping students overcome barriers to learning. They can ensure that learning materials are accessible in a format that meets students' needs in student-centered classrooms. Furthermore, they can boost students' confidence. As children with diverse needs become more engaged in classroom activities, they're likely to participate more and feel more confident about their contributions. Common classroom examples of assistive technologies include: Text-to-speech software: This can help students with dyslexia or reading difficulties to understand written texts. TTS software reads aloud digital document texts, thus aiding students in comprehending the content without struggling through the reading process. Interactive whiteboards: The 21st Century version of the blackboard, IWBs are also an integral part of assistive technology in classrooms. Students with different learning styles can interact with lessons in a way that suits their needs best, whether through visuals, audio, or tactile elements, rather than simply looking at some white chalk on a black board! By utilizing such technologies, educational institutions create an inclusive learning environment that caters to students' unique needs, leading to improved academic outcomes and enhanced self-esteem among students with disabilities. This helps us to fully realize the vision of a differentiated classroom with full participation and equal opportunities for all. Assistive technologies bring indisputable benefits to our society. They contribute significantly to the empowerment and inclusion of individuals with disabilities by offering them unprecedented independence and opportunities. Through improved functionality, these tools foster a more inclusive society and enhance the overall quality of life for users. Given their multifaceted benefits, assistive technologies are undeniably integral in making the world a more accessible and equitable place for everyone. A child uses an augmentive and assistive communication device to communicate their wants. A student uses a sip-and-puff system to move a mouse to access a math program. Another child uses talk-to-text to listen to notes read aloud. Every day, there are many examples of assistive technology that provides new ways for students to access the curriculum and participate in school. Since most students with disabilities are served in the general education classroom, it's important for general education teachers to be aware of how to use assistive technology. Here are ways you can use assistive technology in the classroom. (Just a heads up, WeAreTeachers may collect a share of sales from the links on this page. We only recommend items our team loves!) What is assistive technology? In some ways, a lot of technology is "assistive" in that it all helps us. Our glasses and headphones help us see and hear. Our phones help us access information. As technology expands, technology has made education more accessible for all (think: a talk-to-text program that was designed for students who are blind, but also helps students who have learning disabilities and those who choose to listen rather than read a text). In schools, we typically think about assistive technology in the classroom as the tech that helps students access the general education curriculum. Assistive technology is an accommodation that allows students to work using their strengths to access the curriculum. For example, a text-to-speech reader allows a child who struggles with reading to access a textbook, learning and using content rather than struggling to read the words on the page. How do students get to use assistive technology? Children who have disabilities and have a 504 plan or IEP (Individualized Education Plan) may require assistive technology to access the curriculum. To that end, they may have a device that they use throughout the day or during parts of the day. Assistive technology is an accommodation—it's a way to help a student access the curriculum, not a modification or specially designed instruction. Aside from students who have assistive technology as a part of their IEP, you can incorporate assistive technology into instruction by teaching students how to use technology that is available through programs that they're using every day. A speech-to-text feature may support students who want to talk through an essay before they write it. Or students who are learning to type might benefit from a modified keyboard. What are some assistive technology examples? Assistive technology is available to support all kinds of learning, across the curriculum, from communication to organization to academics. Augmentative and Assistive Communication (AAC) Devices Augmentative and alternative communication (AAC) is a form of communication that can be used instead of or along with talking. A student who has trouble with verbal communication may be provided with an AAC device. For example, a child with autism who does not use spoken words may communicate their wants and needs through their personalized AAC. While some AAC (sign language, writing notes) is not tech-based, the most well-known AAC are tablets or boards that provide pictures for students to point to. The pictures should be individualized for the child so they can use the pictures that mean the most to them. A child may have their preferred activities, favorite foods, and daily schedule on their AAC device to help them communicate most effectively. The most important thing to know when working with a child who has an AAC device is that if you take the device away, even for a little bit, you are taking the child's voice away. Typically a speech therapist will help program and teach a child how to use an AAC device. They will also train teachers on how the student uses the device in school. Learn more: AAC devices at Lingraphica Assistive Technology Examples for Reading Assistive technology for reading makes text accessible by reading it aloud. Some assistive technology examples for reading provide even more support than the old standby, the audiobook. Text-to-speech (TTS) software is designed to help students who have difficulty reading standard print. Students with dyslexia, blindness, or other learning disabilities or physical impairments that impact their ability to read could benefit from TTS. TTS software scans and reads words aloud to the student. Read Aloud A TTS accommodation could be as simple as an audio reader like the Read Aloud Google Chrome extension. This tool reads aloud web pages, PDFs, Google Docs, Amazon Kindle books, and more. There are 40+ languages available, as well as a variety of different voices. Try it: Read Aloud at Chrome Web Store Speechify Speechify is a text-to-speech software that translates text into audio and can be used for textbooks, PDFs, and other text. It can be used with the Google Chrome browser, Macs, iPhones, and Android phones. Try it: Speechify Kurzweil 3000 Kurzweil 3000 is literacy support for various browsers with speech-to-text and text-to-speech. There is a font, Open Dyslexic, that's designed with bottom-heavy letters for dyslexic readers. Kurzweil 3000 software includes features like a talking spellchecker, a picture dictionary, and tools for essay writing, references, note-taking, and more. Buy it: Kurzweil 3000 Google Classroom If your school is a Google campus, Google Classroom has tools that include accessibility like speech-to-text and other organizational tools. Try it: Google Classroom Assistive Technology Examples for Math Students who have a learning disability that affects math (dyscalculia) may have trouble understanding numbers and using math processes to solve problems. But students who have visual impairments, fine motor skill disabilities, or other disabilities may also use assistive technology for math. Magma Math Some math programs, like Magma Math, incorporate text-to-speech software into math programs so students can use this accommodation while working through math problems. Try it: Magma Math Talking Calculator A talking calculator has built-in software that reads aloud numbers and symbols. It also vocalizes solutions to the problems. This is helpful for students who are visually impaired, and for those who benefit from hearing feedback in addition to seeing it. Buy it: Talking Calculator at Amazon Assistive Technology Examples for Writing Kids who have trouble with writing—spelling, organization, punctuation, grammar, proofreading—may benefit from a software that helps them plan and review their work. In particular, students with dyslexia or learning disabilities may benefit from using a proofreading or drafting software that helps them focus on the content of what they are writing, not the mechanics. Draft:Builder Draft:Builder is a tool that combines outlining, drafting, and note-taking to break down the writing process into steps. It uses graphic organizers to help students visualize and organize information. Once the student has input information, the system helps them organize their paper. Try it: Draft:Builder Ghotit Ghotit is a software that helps kids with dyslexia and other learning disabilities with writing. The program learns a student's errors and makes personalized suggestions based on what it knows about the student's writing. Try it: Ghotit Ginger Proofreading Software Kids who have dyslexia may benefit from assistive technology that helps them correct frequently misspelled words and provides other help with writing. For example, Ginger is proofreading software that can analyze content to identify misspellings and make suggestions for corrections. Ginger doesn't take away work, but it gives kids with dyslexia and learning disabilities support around how to spell, organize, and correct their work. Try it: Ginger Clicker Clicker is a platform for reading and writing support. Students can use word webs and use pictograms to organize their ideas. Try it: CrickSoftware Co:Writer Co:Writer provides a variety of supports for writers, including word prediction and flexible spelling, both tools that help kids get ideas down faster without having to focus on spelling. Topic dictionaries and Momentary dictionaries help with word choice. Buy it: Co:Writer Accessible Keyboards Clevy keyboards make keyboarding more accessible by providing larger keys, color-coded organization, fewer keys, and keys that are arranged vertically rather than diagonally. All these changes make it an alternative to the typical keyboard that can help kids who have mobility or learning differences be more successful with typing. Buy it: Clevy keyboard at Rehabmart Talking Spellchecker A talking spellchecker helps students who need assistance spelling individual words. The checker will spell a word and read aloud correct spellings of words. It's helpful for students who need to both see and hear a word. Buy it: Talking Spellchecker at Amazon Assistive Technology Examples for Note-Taking and Organization Students with disabilities often need support with executive functioning, like note-taking, organization, and daily tasks. These assistive technology tools provide extra support around the daily management of learning. Graphic Organizers Graphic organizers, whether paper or online, are a way to help students with disabilities (and all students, really) organize their ideas and capture their thinking in a way that makes sense to them. For kids with learning disabilities, graphic organizers provide extra structure and support as they take notes. Try it: Popplet and Padlet Voice Recorder A voice recorder helps students who benefit from recording discussions or lectures and reviewing it later. A variable-speed feature allows students to slow down the playback so they can listen at a pace that works for them. Buy it: Variable Speed Voice Recorder at Amazon Assistive Technology Examples for Listening Assistive listening systems help students who are deaf, hard of hearing, or those with auditory and learning disabilities. They use a microphone, some transmission technology, and a device to bring sound to the ear to ensure that students can hear instruction. Read more from the National Association of the Deaf. FM System One specific type of assistive listening system is an FM system. This is best for students who have sensorineural hearing loss, or when the nerve pathways from the inner ear to the brain are damaged. FM systems use radio technology to transmit sound between a teacher's microphone and a student's FM receiver. It is especially good for helping kids tune out background noise and hear over a distance. For example, the Jouse 3 is a sip-and-puff system that allows the person to control a device using any part of their mouth. It can be mounted on a desktop or table, and can be used for drawing or playing computer games. Buy it: Jouse 3 and Comfort Contigo Assistive Technology Examples for Mobility Students who have limited mobility can use assistive technology to navigate everything from AAC devices to their computers. Sip-and-Puff Mobility System A sip-and-puff system is used by children who have mobility challenges. Using a sip-and-puff, students can control a computer or device by moving it with their mouth. Buy it: Easy Flex Sip-and-Puff at Enabling Devices Assistive Technology Examples for Vision When students are vision impaired, they may read Braille and may benefit from having a Braille printer, which makes more text immediately accessible to them. Screen-Based Eye Tracker Tobii technology makes eye-tracking devices that turn gaze into a mouse. This is for students with limited motor skills who can look at the screen and navigate a mouse and device that way. Learn more: Screen-Based Eye Trackers at Tobii Braille Printer TactPlus makes Braille printers. These are portable and use specialty paper to print a page of Braille or 3D images. Buy it: Braille Printers at TactPlus Resources Learn more about assistive technology at the Vanderbilt University Iris Center. Learn more about the federal Assistive Technology Act. Bridging Apps is an organization with the focus of bringing people together around assistive technology. Check out their list of apps for learning. What are your favorite assistive technology examples? Share on our WeAreTeachers HELPLINE group on Facebook. For more articles like this, be sure to subscribe to our newsletters. Assistive technology (AT) refers to tools, devices, or software that help individuals with disabilities perform tasks that they might otherwise find challenging. The goal of assistive technology is to improve the quality of life, independence, and productivity for individuals with various disabilities. AT can be used in education, employment, daily living, and healthcare. This article will explore the different types of assistive technology tools, provide examples, and explain their benefits across various sectors. What is Assistive Technology? Assistive technology is a broad category of tools, devices, and services that enhance the abilities of people with disabilities, whether physical, sensory, cognitive, or learning-related. The term includes both high-tech and low-tech solutions, from simple tools like reading pens to complex devices like robotic exoskeletons. Customization: AT tools are often tailored to meet individual needs. Functionality: These tools assist with communication, mobility, learning, and daily tasks. Access: AT tools improve accessibility, enabling individuals with disabilities to participate in activities they otherwise couldn't. Categories of Assistive Technology Assistive technology can be grouped into several categories based on the type of support they provide: These tools help individuals with speech, language, or hearing disabilities to communicate more effectively. Speech Generating Devices (SGDs): Devices like the Tobii Dynavox allow users who cannot speak to communicate by generating speech based on their input. Hearing Aids: Devices like Phonak or Oticon assist individuals with hearing impairments by amplifying sound. Text-to-Speech Software: Tools like Kurzweil 3000 and Dragon NaturallySpeaking convert written text into speech. These tools assist individuals with physical disabilities to move or maintain balance. Wheelchairs: Powered and manual wheelchairs that offer individuals greater mobility. Walking Aids: Tools like walkers, canes, or crutches help people with limited mobility navigate spaces. Exoskeletons: Robotic suits, such as those developed by Ekso Bionics, help individuals with spinal cord injuries regain some ability to walk. Cognitive impairments can hinder memory, attention, and problem-solving abilities. AT tools designed to support cognition help individuals in various ways. Memory Aids: Devices like the MemoBrain app or MindMate help individuals with dementia or memory loss remember important tasks and appointments. Task Management Software: Tools such as Todoist or Trello assist individuals with attention deficit disorders by helping them organize and track their tasks. Reminder Apps: For individuals with cognitive disabilities, apps like Alarmed or Due can send reminders for important tasks. Assistive technology plays a significant role in making education more accessible for students with learning disabilities. Screen Readers: Software like JAWS (Job Access With Speech) helps individuals with visual impairments read text displayed on a computer screen. Word Processors with Speech Recognition: Dragon NaturallySpeaking and Google Docs voice typing help students with dyslexia or physical disabilities to write more easily. Electronic Math Tools: Tools like ModMath assist students with dysgraphia in solving math problems without the need for writing by hand. Visual aids assist individuals with visual impairments or blindness. Magnifiers: Handheld and electronic magnifiers such as the Ruby HD Magnifier help individuals with low vision read print materials. Braille Displays: Devices like BrailleNote Touch allow individuals to read and write in Braille using a touch-sensitive screen. Screen Magnification Software: ZoomText and MAGic software enhance the text and images displayed on a screen for users with low vision. Assistive technology also includes devices designed to help individuals with disabilities manage daily living tasks. Voice-Controlled Assistants: Tools like Amazon Alexa and Google Home assist people with mobility or dexterity issues by allowing them to control devices, set reminders, and even control lights through voice commands. Adaptive Kitchen Tools: Products like one-handed can openers, talking microwaves, and ergonomic utensils are designed to help individuals with physical disabilities perform kitchen tasks. Automated Medication Dispensers: Devices like MedMinder help individuals take their medications on time by providing reminders and organizing doses. Benefits of Assistive Technology Assistive technology can bring a wide range of benefits to individuals, communities, and organizations, including: AT allows individuals to perform tasks they would otherwise need assistance with, helping them lead more independent lives. By providing access to education, work, and social activities, AT helps improve overall quality of life. AT enables individuals to perform tasks more efficiently, enhancing productivity both at home and in the workplace. AT tools can bridge gaps and reduce social isolation by helping individuals with disabilities interact more effectively with others. Devices like medical alert systems, fall detectors, and home automation systems contribute to a safer living environment for people with disabilities. Assistive Technology in Education Assistive technology is increasingly integrated into educational settings to support students with disabilities. These tools ensure that students receive a more inclusive and effective education. Screen Readers (e.g., JAWS, NVDA): These software tools read aloud the text on a screen, allowing students with blindness or low vision to access educational materials. Audio Books (e.g., Bookshare, Learning Ally): Platforms offering audio versions of textbooks and other learning resources. Braille e-Readers (e.g., BrailleNote, Braille Sense): Digital devices that display text in Braille. Text-to-Speech Software: Programs like Kurzweil 3000 and Read&Write convert text into speech, helping students with reading challenges. Speech-to-Text Software: Dragon NaturallySpeaking or Google Dictation can assist dyslexic students in writing by dictating their thoughts. Word Prediction Tools: Programs like Ghotit and Co:Writer predict words and assist with spelling and grammar. Visual Schedules (e.g., Choiceworks): Apps that help students with ASD follow a structured daily routine. Social Stories Apps (e.g., Pictello): Apps designed to teach social skills by using pictures and text to depict social scenarios. Communication Aids (e.g., Proloquo2Go): Augmentative and alternative communication (AAC) apps that support non-verbal students. Challenges of Assistive Technology While assistive technology can offer significant benefits, there are also challenges associated with its implementation. Not all individuals have equal access to AT tools, especially in low-income communities or countries with limited resources. Users may need extensive training to use AT tools effectively. Without adequate support, the benefits of AT can be diminished. AT devices may have limitations in functionality, and not all tools are compatible with every environment or device. In some cases, individuals may face stigma or societal barriers when using assistive technology, especially in educational or workplace settings. Future of Assistive Technology The future of assistive technology looks promising, with advancements in artificial intelligence (AI), robotics, and neurotechnology. Innovations such as brain-machine interfaces, AI-driven personalized learning systems, and exoskeletons are expected to revolutionize the field of assistive technology. Frequently Asked Questions (FAQs) Assistive technology includes tools, devices, and software designed to help individuals with disabilities perform tasks that might otherwise be difficult or impossible. It helps students with disabilities access educational materials, participate in learning activities, and communicate more effectively, leading to improved educational outcomes. Examples include screen readers for the visually impaired, hearing aids for individuals with hearing loss, communication devices for those with speech disabilities, and mobility aids like wheelchairs. The cost of assistive technology can vary widely. Some tools, such as simple apps or devices, may be affordable, while others, like specialized wheelchairs or robotic exoskeletons, can be expensive. Yes, assistive technology is commonly used in workplaces to accommodate employees with disabilities, helping them perform tasks more efficiently and enhancing productivity. Choosing the right assistive technology depends on the individual's specific needs, abilities, and preferences. It is often helpful to consult with specialists or healthcare professionals to select the most appropriate tools. The future of assistive technology includes the integration of AI, robotics, and brain-computer interfaces, which will continue to improve accessibility and functionality for individuals with disabilities. Summary By offering these tools and technologies, assistive technology not only enables individuals to accomplish tasks independently but also fosters greater inclusivity and equal opportunities for people with disabilities. As technology continues to evolve, the future looks bright for individuals who rely on assistive devices to navigate their lives with greater ease and confidence.