*This information is for informational purposes only and cannot be seen as an endorsement.

AT for Cognitive Accommodations

In Wennberg's (2010) study named "Participation When Using Cognitive Assistive Devices – from the Perspective of People with Intellectual Disabilities", it was found that occupational therapist (OTs) should be keenly aware of the social factors that may influence a client's participation in everyday activities when recommending cognitive assistive devices. To build upon this, Asselin's (2014) study emphasizes that the availability of web-based information and built-in features is a tremendous tool for individuals with disabilities because it opens doors to strengthen the cognitive and functional skills they need to succeed in their occupations.

Unfortunately, assistive technology (AT) for cognitive accommodations is highly variable in nature due to the various cognitive deficits an individual may be seeking accommodations for.
Bächle, Daurer, Judt, and Mettler (2018), Chun, Pi, Lee, and Park (2018), Coleman and Adams (2018), Fairman et al., 2016, Powell and colleagues (2015), Seaman and Canella- Malone (2016), and Yeager, Kaye, Reed, and Doe (2006), respectively explored the need for vocational rehabilitation practitioners to understand individual client needs by disability type and need to develop and implement effective strategies and services to assist various populations. Currently, the literature on AT for cognitive accommodations often exclusively examines specialized methods or on aiding specific cognitive deficits, however, this resource is aimed at providing an all-inclusive overlook of the AT that is currently available for those seeking cognitive accommodations.

If you have any further questions on this topic please view the information below or contact the Department for Aging and Rehabilitative Services (DARS) to be connected with an occupational therapist who is skilled in AT for individualized services. Of note, DARS can only cover the expense of an app once, they are unable to cover recurring subscription costs. If you would like more information on which app is best for you without applying for services, please check out Georgia Tech's "Tools for Life" resource at https://gatfl.gatech.edu/favorite-search.php. If you would like further information on job accommodations in the workplace please visit https://askjan.org or https://www.resna.org to find a certified AT specialist. For more information on low interest loans on assistive technology, please visit https://www.atlfa.org.

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1. Devices to Aid Memory
    - According to Chang (2011), a vocational task prompting system for individuals with cognitive impairments may be helpful for attaining job skills while also additionally increasing independence in the process of community integration. Similarly, in Rumrill's (2015) study examining the use of cognitive support technology to improve employment success among students with traumatic brain injuries transitioning from high school to the workforce, positive results were found in regards to the retention and ultimate job readiness assessment of these individuals with the use of cognitive support technology. Of note, it is important to acknowledge that the majority of the studies available on this topic focus on cognitive remediation rather than cognitive maintenance and may thus represent a skewed version of the data available on this subject.

    - There are various types of AT to aid memory. In the literature of Brandt and colleagues (2020), Larsson Lund, Nygard, and Kottorp (2014), Larsson-Lund, Kottorp, and Malinowsky (2017), and Patomella and colleagues (2018), each study respectively concluded that an individual's ability to use everyday technology items was the most helpful skill to aid them in enhancing their "performance of activities in the home and in society and to support his or her likelihood of returning to work" (p. 1618). Examples of every technology include apps and recorders, as well as paper planners or to-do lists. There is also a new sticky note printer with Alexa available which can be viewed at (https://www.amazon.com/Smart-Sticky-Note-Printer-Works-with-Alexa/dp/B08SZ26WF9), and a helpful video on how to use Alexa for people

with disabilities can be found at https://alexaforseniors.net/disabled-alexa-commands/.

- Tracking and identification systems available such as the GPS Locator watch, home monitoring systems, smart home systems, and many more are also often utilized as memory aids for individuals seeking cognitive accommodations.
    - Popular apps to create **visual** task lists are:
        - First Then Visual Schedule
        - CanPlan
        - Visual Planner
        - ChoiceWorks (https://www.youtube.com/watch?v=g0tZ-kNK4EM)
        - ChoiceWorks Calendar
        - Picture Scheduler
        - Trello
    - Some individuals may prefer to use written task lists instead of visual task lists. Popular **written** task list apps are:
        - Any.do
        - Plan it, do it, check it off
        - Routinist
        - Habitica (which is a gamified task list!)
        - Google Keep (https://www.youtube.com/watch?v=-HZkasJcbGA)

2. Devices to Aid Time Management
    - There are three main components of time management: Awareness (how much insight you have as to how you perform in regards to time), Arrangement (how you structure work around your life), and Adaptation (how you perform in high stress situations and your ability to adjust your decision making) (Time management skills: Aware, Arrange & Adapt: Better time managers, 2020). In Gentry and colleague's (2010) study investigating the use of personal digital assistants as cognitive aids for high school students with autism, they found that individuals reported improved self-ratings of their performance and satisfaction in everyday life tasks with the use of these devices. Similarly, Arvidsson (2006) found time aids to be crucial in helping individual's increase independence. Popular time management devices are:
        - Utilizing the clock, timer, calendar or reminder apps on smartphones (https://youtu.be/JpR842MGX-Q) (https://www.youtube.com/watch?v=vxQo-ix8XRQ)

        - "How to set custom timers with Alexa" (https://www.cnet.com/how-to/how-to-create-named-timers-with-alexa/)
    - Fitbits, apple watches and other smart watches
    - The time timer watch (https://www.youtube.com/watch?v=aZGJyspbo_k) or quarter-hour watch (https://askjan.org/products/Quarter-Hour-Watch.cfm)
    - The ReVibe (https://revibetech.com)
    - The Timetimer (https://www.youtube.com/watch?v=qj31ky0Fkm0)
    - Using the Pomodoro Technique (https://www.youtube.com/watch?v=mNBmG24djoY)
    - Apps: Focus Keeper, Hours Time Tracking, Flat Tomato

3. Devices to Aid Reading
    - Devices to aid with reading can be of great assistance to individuals in need of cognitive accommodation. Popular apps to assist with reading are:
        - Voice Dream reader
        - Natural Reader (https://www.naturalreaders.com)
        - Prizmo Go
    - Please check out "iPad Apps for Learners with Dyslexia/Reading and Writing Difficulties" at https://www.callscotland.org.uk/blog/new-and-revised-ipad-app-wheels/ for more information on helpful apps.
    - Software and Devices:
        - Read Write (https://www.texthelp.com/en-us/products/read-write/)
        - Kurzweil (https://www.kurzweiledu.com/default.html)
        - ClaroRead
    - Often devices for people with vision impairments can be helpful as cognitive aids as well so talking tape measures, scales, and other talking devices could provide useful accommodations as well.

    - Optical Character Recognition:
        - Seeing AI
        - Claro scanpen (app)
    - Please see the visual resource for more information on optical character recognition

4. Devices to Aid Writing
    - Devices to aid with writing can provide great assistance to individuals in need of cognitive accommodation as well. Word prediction software, such as WordQ (https://www.quillsoft.ca/wordq5), spell-checking programs are such as Grammarly (https://app.grammarly.com) and graphic organizers like Inspiration software or the Popplet app (https://www.popplet.com) are popular applications to assist in this area.
    - Please check out "iPad Apps for Learners with Dyslexia/Reading and Writing Difficulties" at https://www.callscotland.org.uk/blog/new-and-revised-ipad-app-wheels/ for more information on helpful apps for individuals seeking cognitive accommodations.

5. Devices to aid notetaking
    - Devices to aid with notetaking can also be of assistance to individuals in need of cognitive accommodation. Popular apps to assist with note taking are:
        - Glean (https://glean.co)
        - AudioNote
        - Notability (https://apps.apple.com/us/app/notability/id360593530)
        - Livescribe smartpens (soon releasing a new product)
        - Transcription services such as Note Taking Express
        - Sonocent (https://sonocent.com)
    - Please check out "iPad Apps for Learners with Dyslexia/Reading and Writing Difficulties" at https://www.callscotland.org.uk/blog/new-and-revised-ipad-app-wheels/ for more information on helpful apps.

6. Devices to Aid with Prompting, Cueing, and Coaching
    - In Larson's (2014) study it was found that repetitive, computer-assisted training programs can produce learning outcomes in people with mild and moderate cognitive disabilities that are comparable to those achieved by high-quality one-on-one tutoring. In similar studies by Chang, Chou, Wang, and Chen (2013), Gentry and colleagues (2015), Lancioni and colleagues (2014), and Van Laarhoven and colleagues (2018) they respectively concurred, also finding that they need for personal supports needed by individuals with disabilities was able to be met through the use of personal digital devices. Common devices, apps or software used for individuals seeking cognitive accommodations to aid with prompting, cueing, and coaching are:

- The ReVibe
- Fitness trackers like Fitbit
- MotivAider - app and device (https://youtu.be/yMmhEJZj-mo) (https://youtu.be/DV4VBaRRspA)
- Apps: MultiTimer, Timer Plus
- Padlet, software aiding organization (https://padlet.com)
- Yourminder (https://www.youtube.com/watch?v=Pwr2yAPlneQ)
- Rosie Reminder
- Voice cue
- Navigation devices with GPS and speech output capabilities (such as Wayfinder or CanPlan)
- CanPlan Cancer Planner (https://mycanplan.com)
- Wearable Coach
- Visual or written task lists

7. Devices to Manage External Stimuli
    - Devices that can help control external stimuli can also be very useful for individuals in need of cognitive accommodations. Popular stimuli control devices are:
        - Prism glasses (https://www.amazon.com/Glasses-Horizontal-Watching-Reading-Spectacles/dp/B07HK96YD4)
        - Auditory limitation systems
        - “Focus Mode” app on Microsoft
        - “Reader Mode” on iOS devices
        - Filtering lenses, like Theraspecs
        - Noise reduction headphones (such as from Bose or Sony)
        - Noise filtering devices like HearOs (https://www.hearos.com/products/earplugs-high-fidelity-series-with-free-case)
        - Calmer (https://www.flareaudio.com/products/calmer)

8. Tools for Concept Organization and Decision Making
    - According to Graham and colleague's (2020) study "Exploring Assistive Technology Decision-Making Among Older Adults Aging in Place", individuals typically settle on the first item presented and highly value an expert's opinion when choosing AT. Alves and colleague's (2020) study found positive results from OT interventions addressing cognition with geriatric clients who have mild neurocognitive disorder, resulting in improved independence in activities of daily living, reduced memory lapses, and improved overall cognitive function. Beyond OT specific interventions, there are multiple tools available to aid individuals in need of cognitive accommodations with concept organization and decision making. Examples of these are:
        - Inspiration concept mapping software
        - Apps such as Schedule Assistant or ChoiceWorks
        - Pro/con lists
        - Social stories
        - The use of diaries to learn from your mistakes
        - Resources that offer options for reminders, such as for medication reminders, such as the E-pill (https://www.epill.com)

9. Tools that Provide Alternative Input and Output
    - In Damianidou's (2018) study the most sought-after features of employment-related technology were examined and it was found that for individuals with intellectual and cognitive disabilities cognitive aids with audio features were the most popular. Tools that provide alternative input/ output such as voice recognition software instead of text-based icon-based pointing or tapping, or speech-to-text screen reader apps are available to assist individuals in need of cognitive accommodations in this area. Some examples of these accommodations are:

- Speak Screen feature (on iOS)
- Text to Speech (on Android)
- Natural Reader (www.NaturalReaders.com)
- C-Pen Reader scanning pen (https://youtu.be/J3gusdxFeM8) (https://www.youtube.com/watch?v=B513xa6TRqQ)

10. Tools that Aid Participation

- There are various tools available for individuals seeking to increase their participation through the use of cognitive accommodations as well. Sandjojo and colleagues (2019) found positive results with the implementation of a self-management training supporting people with intellectual disabilities in managing their daily affairs. Cullen, Alber-Morgan, Simmons-Reed and Izzo's (2017) study they found that video-based self-directed prompts can promote improved performance in employment settings. These are just two examples of AT as participation aids, but examples can range from the use of apps such as Slime to workstation accommodations such as using a Bosu ball or wiggle seat to stay on task. For more information on participation aids please contact an OT who specializes in AT or apply for individualized services with DARS.

Case Study Examples:

Cindy is a 43-year-old female who has been referred for services with an Occupational Therapist who specializes in assistive technology to identify strategies to overcome cognitive impairments she's been experiencing since her traumatic brain injury one year ago. She relayed that she experiences frequent memory deficits, visual perception impairments, and has difficulty with wayfinding. Due to her impairments, Cindy has difficulty following a purposeful daily routine and seeking employment and has recently been diagnosed with a general anxiety disorder in relation to her stress with her current situation. Cindy relayed that she uses her iPhone calendar to keep track of appointments, but has not used Reminders. Cindy was encouraged to use the Reminders app for appointments and other important dates and to use a single to-do list in a notebook to keep track of tasks to complete. It was recommended that she select 3-5 things to focus on each day. Additionally, she was encouraged to make copies of this list and place it in other rooms of the house as a memory aid. Cindy was also encouraged to use a medication dispense with AM and PM containers to facilitate taking all medications each day. She was guided in identifying activities to incorporate into her day to manage fatigue and improve attention and memory. Cindy made a plan to do seated exercises after breakfast, spend an hour job searching, work on home management tasks, have lunch, then continue job searching until 3 pm. A rest period/time for reading is planned at 3 pm, begin to prepare dinner at 5 pm, have dinner, and then engage in leisure activities until 10 pm when she goes to bed. Cindy reports feeling much more organized with the implementation of this balanced yet purposeful routine to support her areas of difficulty.

Sarah is a 54-year-old female who worked as a nurse until she recently had a severe concussion. She has had multiple concussions in the past from horse riding, but her last concussion left her with severe memory deficits which forced her to take a leave of absence from her job. When meeting with an occupational therapist who specializes in assistive technology, Sarah reports that she has noticed her primary area of difficulty is remembering to finish tasks during home maintenance. The occupational therapist recommended that Sarah utilize her Apple Watch for reminders with the vibration turned on for tactile feedback and recommended an Amazon Echo (Alexa) home system for additional reminders around the home. Training with both the Apple Watch and Alexa was conducted to enhance carryover of education. Sarah reports having been able to complete all of her home maintenance tasks successfully with the use of her Apple Watch and Alexa device and within the last two weeks and she is confident these strategies will help her be able to complete tasks at home and manage the additional demands when she returns to work.

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