Work & Industry

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Mobile Technologies to Support Workers With Cognitive-Behavioral Challenges

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Finding and keeping employment is a challenge for individuals with cognitive and behavioral impairments (Benedictus et al., 2010; Chien et al., 2017). Many workers with a cognitive-behavioral disability initiate work placements under the supervision of a job coach, who may incorporate environmental modifications, task simplification, and instructional materials into an individualized suite of vocational supports.

Occupational therapists (OTs) working as assistive technology (AT) specialists often collaborate with workers and job coaches to find ways to reduce direct supervision and increase independent task performance, the ultimate marker of success on the job. For instance, OTs may introduce supportive strategies that use mobile devices to address vocational goals. These tools can be configured to enhance and serve as substitutes for some human supports, providing automated reminders, to-do lists, instructional guides (in slide show or video format), and stress management aids, while also allowing remote access to job coaches through phone, video chat, or text message, as needed. This article discusses how to select appropriate automated supports and introduce them in a stepwise manner so that workers can function more independently on the job.

Assessment Strategy

The Assistive Technology for Cognition Laboratory in the Occupational Therapy Department at Virginia Commonwealth University (VCU) has conducted a series of community-based research trials exploring how personal digital assistants and tablets may support individuals with cognitive-behavioral challenges (Gentry, 2008; Gentry et al., 2008, 2010, 2015). Following an evidence-based model, the OT conducts an AT assessment at least 1 week after a worker starts their supported job placement. The well-known Human-Activity-Assistive Technology (HAAT) model works well for such an assessment, because it incorporates an appreciation of a person's skills and desires (H) in relation to activities (A), in this case vocational tasks, and the provision of an AT device to facilitate success in these activities (Cook & Polgar, 2015). The OT meets with the worker, job coach, and employer to discuss elements of the job that require direct supervision and that may be managed with *less supervision* if a mobile device is used. This is the key question and deserves a considered discussion, because workers succeed or fail based on how independently they can perform their work duties. Typical automated supports may include: task reminders; time keepers; task checklists; task-sequencing cues for complex activities; way-finding supports inside the workplace; communication tools; behavioral cues and social stories; and anxiety management applications (apps). See Table 1 on page 32 for a brief list of vocational

support apps. These apps are accessible, easy to use, and are free or inexpensive to purchase.

The initial evaluation meeting concludes with the team prioritizing which issues to address first with the mobile device. The OT then shows the worker how to navigate the screen, turn apps on and off, and maintain and charge the device. Many people with cognitive-behavioral challenges also have sensory or motor issues that can make accessing a mobile device problematic. Fortunately, these devices now incorporate a rich suite of accessibility settings that can be useful in most OT settings. These settings can make smartphones and tablets accessible to people who have visual or hearing difficulties and those with severe mobility impairments. Because mobile devices are used by consumers in all walks of life, they are not stigmatizing. The VCU research participants learned to rely on them, take care of them, bring them to work consistently, and charge them as needed.

Training Strategies

Reminder Messages: Once the OT is sure that the worker can navigate the mobile device and respond to its prompts, the worker selects one AT-based vocational support for an on-the-job trial. Often, the first support provided is a series of daily reminder alerts (using a calendar or clock app) for vocational transitions such as waking up, performing a morning hygiene routine, catching a bus to work, clocking in and out, taking work breaks and lunches, and switching tasks. The worker is asked to carry the device at work at all times (often on a belt clip or lanyard for hands-free work performance) and follow the reminder alerts. The worker is responsible for charging the device overnight at home; an alert message is added to remind them to do so.

Task Sequencing and Instruction: Many workers benefit from adding a to-do list or task-sequencing support next. Provision of these supports is highly individualized. Some workers function quite well with reminder alerts and a simple automated task checklist app. Others require more detailed guidance, which may be provided through step-by-step audio prompts (using an onboard voice recorder), pictorial slide shows (made using the device camera and slide show apps), or instructional videos (using the onboard video camera and video modeling apps). Additional videos or slide shows can provide directional cues in the workplace, or provide behavioral instruction for managing difficult social situations. When learning to perform a video-modeled task, workers are encouraged to watch the video immediately before performing a task, play and pause the video as needed while performing the task, and review the video after task completion to double check their work. Research shows that this preview-do-review method can be quite successful in teaching complex occupational skills (Bellini & Akullian, 2007; Van Laaarhoven et al., 2007).

Table 1. Brief List of Vocational Support Apps

App	Features
Reminder Alerts	
Clock*	Basic reminder that allows different sounds for different prompts
Bug Me!	Electronic sticky note reminder—includes pictures and text
Voice Reminder	Record your own voice as a reminder message (for non-readers)
Life Reminders	Picture prompts from your photo library (for non-readers)
Task-Sequencing	
Notes*	Create picture sequences with text and to-do lists for complex tasks
Google Keep	Similar to the Notes app
Visual Schedule Maker*	Build picture-and-text instructional slide shows
Functional Planning System*	Build task lists and reminder alerts linked to instructional videos you build inside the app
Can Plan*	Create instructional videos linked to reminder alerts for just-in-time task support
Behavioral Support	
iRewardChart	Goal-based behavioral rewards
Breathe2Relax	Relaxation and stress management guidance
Simply Being	Step-by-step relaxation and stress management support

Note. Those with astrisks are only available through Apple. All others are available through Apple and Android.

Ancillary Supports: Once the worker has learned to independently access reminder messages and task-sequencing prompts, the addition of other supports may be considered. Most of the workers in the VCU studies relied on a favorite gaming app to play during breaks and going to and from work. They learned to access *YouTube*, music apps, or other Internet resources for entertainment, and they used relaxation apps to combat workplace anxiety. Workers were taught to use *Facetime* or *Skype* for video chat connections to off-site job coaches. Workers additionally used the onboard calculator, flashlight, and carpenter's level for workplace tasks, and some used simple finance management, augmentative communication, behavioral reward, or note-taking apps, as needed.

Follow-Along and Fading

The OT intervention using this model requires an average of 10 hours per worker across four to five meetings spread over a month, during which workers learn to use one app successfully before another is implemented. This model allows for stepwise AT incorporation and increased functional independence as modeled by the initial training meeting. The OT addresses each item of the supports priority list, adding a new support when the worker has attained independence in using those already onboard. In many cases, this process can be completed during 1-hour weekly meetings during the first month

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apps used for reminding, task sequencing, way-finding, emotional regulation, and games). Keep in mind, however, that workers may use these apps intensively. For instance, workers may have 10 to 15 reminder messages each workday along with several video-based prompts. Strategies for measuring outcomes from this intervention may include: (1) asking the worker to demonstrate successful mobile device use, (2) observing everyday use of AT on the job, (3) comparing hours of direct job coaching support before and after intervention, and (4) surveying the worker, employer, and job coach about task performance and satisfaction.

Workplace Considerations

Some employers frown upon using mobile devices in the workplace, but OTs could show them how these tools serve as AT that promotes improved production and functional independence. Occasionally, a worker chooses not to adopt a mobile device, despite the OT's best efforts. Under the HAAT model, the end user is always the ultimate arbiter of AT use, and if a worker chooses not to adopt the device as a vocational aid, the OT and job coach must rely on other supportive strategies. Finally, the cost of a smartphone or tablet, apps, and data usage must be taken into consideration. In many cases vocational rehabilitation agencies will pay for them, especially if the OT explains the evidence base and benefit of such an intervention.

Conclusion

Many workers with cognitive-behavioral challenges can learn to use mobile devices as vocational support aids. These tools, when matched with an individualized suite of apps and strategies, can promote functional performance and reduce the need for onsite supervision and job coaching.

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Evidence Supports Web-Based Cognitive-Behavioral Therapy Program