



NeMTSS
FRAMEWORK



November 2025

NeMTSS Research Brief

Assistive Technology and Behavior

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**NEBRASKA CENTER FOR RESEARCH ON
CHILDREN, YOUTH, FAMILIES & SCHOOLS**

Assistive Technology and Behavior: An NeMTSS Research Brief

Key Points:

- Assistive technology (AT) is any device (e.g., self-monitoring and classroom management tools, video modeling, timers) used to enhance an individual's functioning. In educational settings, AT can be helpful in behavior management.
- Outcomes of AT include increased autonomy for students, a reduction in unwanted, disruptive behaviors, and improvements in positive behaviors.
- Educators should consider four factors when selecting AT to best support student behavioral needs: potential antecedent events, behavior tracking and measurement, self-monitoring skills, and the encouragement of pro-social behavior.

Introduction

Effective behavior management is crucial in creating a successful educational environment. Behavior and academic achievement have an inverse relationship (Kremer et al., 2016), meaning that as behavior problems increase, academic performance will decrease. This inverse relationship highlights the importance of effective behavior management in the educational environment. Previous literature has examined AT use for behavior management in diverse populations, including populations with Autism Spectrum Disorder (ASD), Attention-deficit/hyperactivity disorder (ADHD), and broader populations (without a diagnosis). Within the MTSS framework, AT contributes across all tiers by offering universal classroom supports at Tier 1, targeted small-group interventions at Tier 2, and individualized support at Tier 3 to address behavioral needs.

Defining AT

The World Health Organization (WHO) defines AT as “assistive products and related systems and services developed for people to maintain or improve functioning and thereby promote well-being” (WHO, 2016, p. 1). The primary objective of assistive products and devices is to increase individuals' functioning (WHO, 2016). AT works to support individuals in various aspects of their lives, including educational, professional, and social settings. In the context of the educational environment, the Individuals with Disabilities Education Act (2004) defines AT devices as “any item, piece of equipment or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of children with disabilities” (34 C.F.R. § 300.5). Similarly, Kirkpatrick et al. (2022) use the term “digital technology” to describe computer-based technology that supports students' learning. AT can be as advanced as a special keyboard to assist in education, or as simple as text reminders on a device. In summary, AT refers to a device or product to support one's functioning, with the goal of improving independence.

While AT shares the goal of improving functioning, it often looks different depending on various factors, including the population, the behavior being targeted, and the setting.

Self-monitoring Tools

Bruhn et al. (2017) define electronic self-monitoring as the use of a mobile device to prompt and track behavior. Technology-based self-monitoring is a term used to describe various apps and functions on mobile devices and often looks very different for each individual. In Bruhn et al. (2017), three secondary students receiving Tier 2 interventions used the SCOREIT app to rate their behaviors at 10-minute intervals. Teachers also rated the students' behaviors using the same constructs. Results showed that using the SCOREIT app was highly effective for one student and moderately effective for another in self-monitoring behavior. The authors suggested that the third student may need additional support than the Tier 2 intervention offered.

Various functions on mobile devices, such as vibration, can prompt a desired behavior. Lai et al. (2018) found that hyperactive behavior decreased when three students, two elementary students and one secondary student, were exposed to vibration reminders. Subsequent research found that simultaneously applying smartphone vibration and visual text prompts helps elementary students reduce hyperactive and impulsive behaviors in the classroom (Lai et al., 2020), indicating that a combination of visual and physical stimuli can be helpful in prompting a desired behavior. Similarly, more recent research by O'Neill and Smyth (2024) corroborates these results. Their study demonstrated that text message prompts paired with a vibration were effective at prompting independent study, leading to increased time spent studying independently among adults with ASD attending university.

Parette et al. (2007) describe how various tools, such as stopwatches, handheld counters, and smartphones, can help track and measure behavior. The article further describes how a stopwatch can help the student understand the passage of time and cue the desired behavior or task. The stopwatch may also help to eliminate the burden of time management, enabling the student to better focus on the desired task. Similarly, handheld counters may reduce the cognitive load, especially for students who have difficulty counting, allowing them to focus on the desired task. Although smartphones and other mobile devices vary in functionality, many can present task-related prompts and provide feedback based on student responses.

Technology-based Classroom Management

AT can be used at the classroom level to support desirable collective behaviors and group dynamics. Lynne et al. (2017) studied the impact of implementing a variation of the Good Behavior Game through a computer-based program, ClassDojo. The Good Behavior Game is a group-oriented contingency in which students are 1) assigned to teams, 2) given points for exhibiting contextually inappropriate behavior, and 3) rewarded for the lowest number of points (Barrish et al., 1969; Bowman-Perrott et al., 2016). Through ClassDojo, teachers can reward appropriate behavior and penalize contextually inappropriate behavior using a point system, as well as provide engaging feedback with animations and sounds (Lynne et al., 2017). ClassDojo collects classroom behavioral data over time, allowing teachers to track changes. Lynne et al. (2017) found that the use of the Good Behavior Game with ClassDojo reduced class-wide disruptive behavior and increased academically engaged behavior.

Modeling

Video Modeling

Video modeling is another helpful tool in behavior management as it is a demonstration of a desired behavior or skill (Murry, 2018). As described in Green et al. (2017), early literature

supports the use of video modeling to enhance social skills in children (Ballard & Crooks, 1984; Keller & Carlson, 1974). Specifically, creating and/or finding videos with models that hold similar identities (e.g., age, gender, identity) as the targeted audience helps to individualize the intervention (Green et al., 2017).

Video self-modeling differs from video modeling in that the target student models the desired behavior in the video, which can later be viewed by the student (Murry, 2018). Video self-modeling is typically teacher-directed; however, Murry et al. (2018) found student-led video self-modeling to be effective. Student-created video modeling allows the student to take autonomy in the intervention by developing goals, identifying methods for monitoring, and creating and using the video self-modeling.

Alternate Forms of Modeling

As described in Parette et al. (2007), additional tools such as Power Cards and Social Stories can help students better understand social situations and develop social skills. Power Cards are individualized visual aids that depict how a character (of interest) encounters and solves a relevant problematic situation (Gagnon, 2001). Likewise, Social Stories present information about situations or skills in a way that is easy for the student to understand (Parette et al., 2007), often including digital presentations or printed books that describe how the student should respond in a given situation. Social Stories might include photos of the student, trusted adults, and preferred items or interests.

Implications for Educators

Choosing AT can be challenging. The variety of available devices and strategies, along with pressure to make the “right” choice, makes it difficult to know where to start. Parette et al. (2007) identified four tips that educators should consider when selecting AT:

1. Potential background events (or antecedents)
2. The importance of tracking and measuring behavior
3. Self-monitoring abilities
4. The promotion of social behavior

Tip #1 describes how antecedents (events that occur just before the behavior) prompt a contextually inappropriate behavior. AT can be used to reduce antecedents that trigger contextually inappropriate behavior across various academic areas (Parette et al., 2007). Parette et al. (2007) describe how the writing process requires multiple skills, including focused attention, fine motor skills, spelling, and more. This may cause frustration for students throughout the entire writing process, even if they only have deficits in one specific skill. AT, such as speech recognition, allows students to write without needing typing or handwriting skills, thereby eliminating a potential source of frustration.

Tip #2 describes how AT can support the data collection process without increasing the demands on classroom teachers (Parette et al., 2007). Educators must track behavior to assess student progress. AT such as stopwatches, handheld counters, smartphones, and computers can be used to help track and measure behavior and involve the student in doing so.

Tip #3 explains that visual/auditory prompting devices, visual/auditory cueing devices, and self-graphing devices can be helpful in self-monitoring (Parette et al. 2007). AT may allow students to increase their autonomy in the behavior modification process, through self-monitoring.

Tip #4 emphasizes the importance of promoting social behavior through AT. Students with emotional and behavioral disorders often need support in developing appropriate social skills, highlighting the importance of including a social component in AT (Parette et al. 2007). Parette et al. (2007) state that AT tools such as Power Cards and Social Stories help students make sense of social routines and better understand social cues and environments.

Fortunately, educators are not alone in this process. Considerations should be made by the Individualized Education Program (IEP) or problem-solving team as each team member provides unique expertise. Team members should carefully determine the AT that will be used, considering potential antecedents, how the behavior will be tracked and measured, self-monitoring abilities, and the promotion of social behavior.

Conclusion

Effective behavior management is essential for creating a successful learning environment. Aligning with the MTSS framework, AT can offer behavioral support across all tiers, providing universal classroom support (e.g., ClassDojo), targeted small group intervention (e.g., SCOREIT) and individualized intervention (e.g., Power Cards and Social Stories). This tiered support promotes independence, encourages desired behaviors, and reduces contextually inappropriate, disruptive behaviors. When choosing the appropriate AT, educators should consider potential background events (or antecedents), the importance of tracking and measuring behavior, self-monitoring abilities, and encouraging social behavior. For more information on AT supports from the Nebraska Department of Education, please visit <https://atp.nebraska.gov/>.

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Recommended Citation:

Petsche, T. E. & Witte, A. L. (2025). *Assistive Technology and Behavior: An NeMTSS research brief*. Nebraska Multi-tiered System of Support (NeMTSS).

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