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New Frontiers in Learning

As we move through this digital age, students in high school and college are increasingly using technology as a mechanism to support learning. Technology can be used in a multitude of ways, ranging from electronic organizational systems and digital reminders to supporting more complex academic tasks through the use of computer software. Assistive technology, specifically, has been infused into the daily schedules of students with disabilities to support the removal of learning barriers that some individuals may face. Among students utilizing assistive technology to improve academic learning, high school and college students diagnosed with autism spectrum disorders (ASD) in particular have increasingly incorporated the use of technology into the learning environment.

Assistive technology consists of services and devices that provide equal education opportunities to students with disabilities by providing supports that focus on individual-specific needs. Assistive technology has been used to improve skills in areas such as note-taking, reading comprehension, and expository and narrative writing. Such tasks are integral to the academic experience, in that a student’s ability to excel in these areas most often is directly related to their level of success. This article will discuss why assistive technology is necessary for students with ASD transitioning from high school to college, as well as outline three forms of effective assistive technology, and how one would incorporate such technology into the learning environment.

Research has demonstrated that the use of computers has resulted in the improvement of the skills of students with ASD in a variety of different areas such as attention, the motor, and generalization (Habash, 2005). Improvement of skills is many times the desirable goal, and therefore technology can act as a means to accommodating specific deficits that prevent goal attainment.

In order to achieve success in the high school and college arenas, students need to be able to access supports to successfully comprehend large amounts of reading material and class lectures and discussion, as well as write at a much more independent and sophisticated level. When students demonstrate weaknesses in these areas, they are unable to demonstrate their maximum potential, and their work may become an inaccurate representation of their true capabilities. Assistive technology can begin to bridge the gap between student obstacles and the execution of their academic responsibilities.

Developing individuals and systems for use with assistive technology is important to master during high school so students can effectively deploy the technologies at the college level. The college work environment has a few fundamental differences from high school that can increase the difficulty level, especially for students with ASD. Class time at universities is devoted to many more lectures, requiring vigorous note-taking on course content that, many times, is important to know for exams, class projects, and discussion. Sometimes the material covered in class is not covered anywhere else (i.e., textbook, PowerPoint slides, handouts, etc.), requiring techniques to ensure all material is accessible by the student. Outside of the classroom, reading materials tend to also become more taxing, covering abstract topics that can be difficult to understand. As opposed to reading simply for content, there is an increased emphasis of being able to analyze readings. Further, while high school classes tend to provide guided questions to lead the student through the readings, college classes tend to rely on the student to identify key topics and themes.

The fundamental changes above can seem hard to manage; however, by establishing assistive technology supports while still in high school, such transitions can be managed in a much more efficient manner. Creating a course of action is important for students with ASD because environmental changes may lead to higher levels of stress that can drastically affect a student’s ability to participate and succeed in the learning environment.

Below are some examples of how technology can be used to support students with ASD in the learning environment with a focus specifically on supporting students at the high school and college levels.

Tablets and Computers

With the advancement of technology, hand-held computers are becoming more common. The use of these hand-held devices is slowly permeating into the academic field, finding particular use for students with ASD. Independent developers can create applications to address specific needs, but the digital aspect of reading materials is one of the most important benefits of these new devices. These devices can address fundamental difficulties a student may face, such as fine motor difficulties affecting the ability to turn the pages of a book. By utilizing a tablet, the frustration that manifests from these complications can be avoided (Stachowiak, 2010). Further, digital copies of lecture materials allow students to manipulate these notes in ways that can be beneficial. This can include, but is not limited to: increasing text size, color coding, sharing of notes, or incorporating supplemental notes or comments (Stachowiak, 2010). Digital books allow for a seamless experience for reading, allowing students to have all of their books in one place, along with supportive resources such as a dictionary, thesaurus, and online search engines.

Smart Pen

Assistive technology is extremely important for students that struggle with content heavy courses. Many times, ineffective listening skills and poor note-taking skills are the primary obstacles preventing comprehension of class lectures (Boyle, 2010). Smart Pens can be utilized to alleviate such hurdles. A Smart Pen is “a pen that contains a recording device, which when used with its accompanying notebook, links written notes to what was recorded at the time the note was written” (Stachowiak, 2010, p.5). As students are taking notes, the pen matches up the location of the notes to the time of the lecture, allowing students to review the contents of the lecture in tandem with specific locations in their notes. This allows students to supplement their notes with portions of the lecture they may have missed or misunderstood. The audio files can be transferred to the computer in order to make a more seamless experience of reviewing notes. Further, research has demonstrated that classmates who share Smart Pen audio files online tend to have lower numbers of accommodation requests for notes and note takers (Stachowiak, 2010).

Word Prediction

Word prediction technology is found as a feature in many computer word processing programs today. These programs, such as Co-Writer, provide students with a list of up to thirty possible target words after typing the initial letters of the word they are attempting to express. This software assists individuals in the writing process by changing the concentration from the physical activity of typing to the mental activity of processing and planning which words to use to express thoughts. The use of word prediction has led to an increase in the fluency and legibility of students’ written work (Peterson-Karlan, 2011). Word prediction can support word retrieval issues, spelling difficulties, and writing breakdowns, and has been found to increase content legibility, spelling accuracy, and writing efficiency (Handley-More, Deitz, Billingsley, and Coggins, 2003; Evmenova, Graff, Jerome, & Behrmann, 2010). Additionally, the results of a study conducted by Miranda and Turolla (2006) found that students using word prediction software led to an increase in writing stamina and a decrease in writing frustration. By removing the distraction of spelling errors and the frustration of the mechanics of writing by hand, there is an increased emphasis on content, allowing students to maintain focus on the topic at hand.

Using assistive technology to support individuals with ASD helps to overcome the limitations that have made academic success elusive for students in the past. It is important to start using technology to support learning in college while students are still in high school, as the work is more manageable and allows time to master the technologies, leading to improved preparation for the higher demands of college level curriculum. Getting systems of assistive technology put in place as early as possible will allow for higher levels of academic independence as the road to college approaches.

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References


