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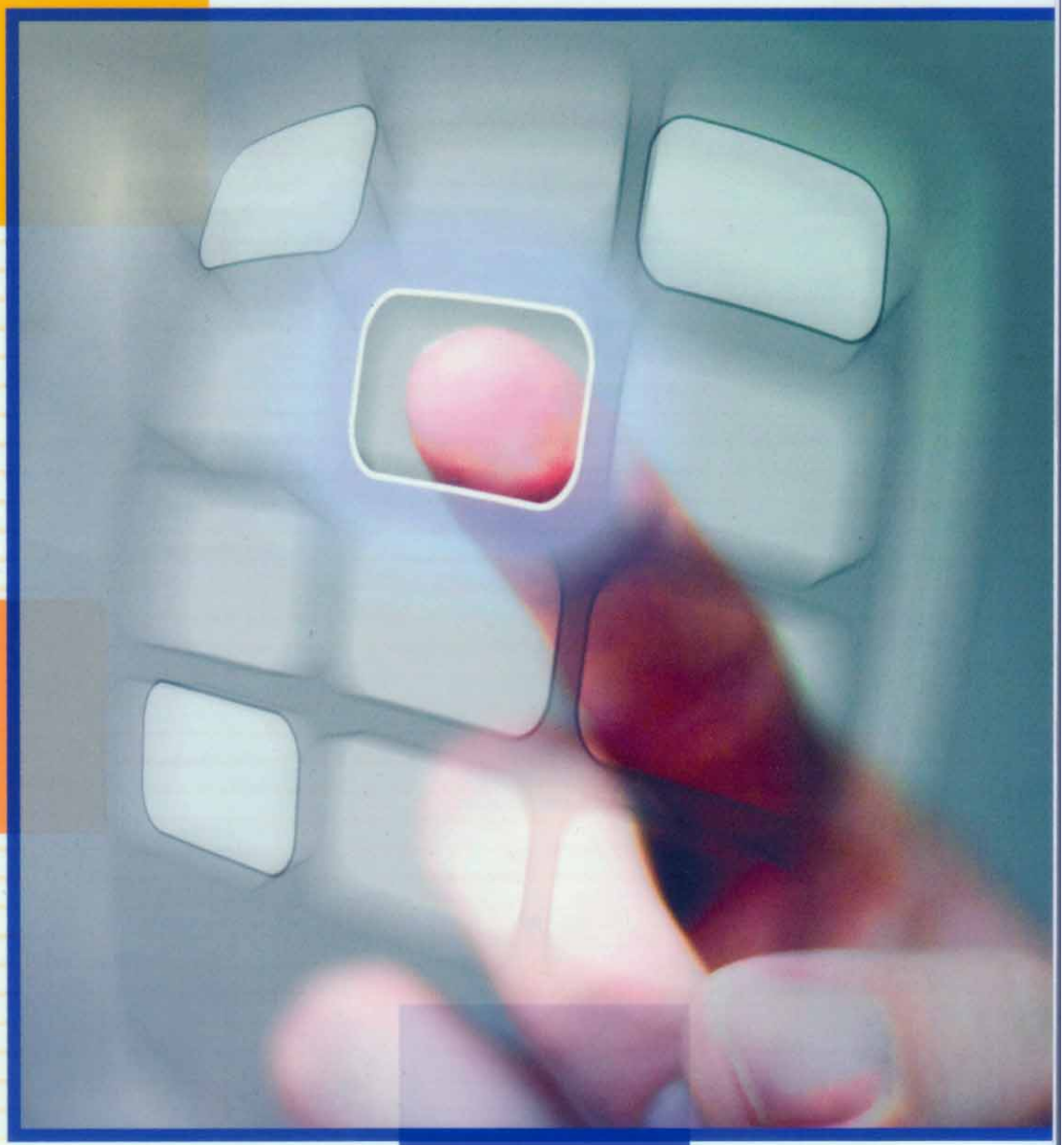

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Results of a Video Prompting Intervention Package Impacting Dishwashing Skill Acquisition for Adolescents With Autism

Stephanie J. Gardner[1] and Pamela S. Wolfe[2]

Abstract

In order to maximize the future level of independence learners with autism spectrum disorder display, daily living tasks can be taught in K–12 programs using a variety of instructional methods, including video-based instruction. This study investigated the effectiveness of an instructional package including video priming and prompting along with a graduated guidance error correction procedure to teach dish washing skills to four adolescents with autism. A multiple baseline across participants design demonstrated that three of the four participants acquired dishwashing skills upon introduction of the intervention. In addition, two participants were able to generalize their performance to two novel settings and maintain their skills for up to 3-week postintervention. Future research should further explore the efficacy of error correction procedures used with video prompting and the impact that these procedures have on student learning and skill retention.

Keywords

trauautism, exceptionality, functional academics, content/curriculum area, small *N*/single-subject design, methodologies, video applications, technology perspectives, instructional technology

Independence when performing everyday tasks is an important area of focus for students with autism spectrum disorders (ASD), and being able to display such autonomy plays a critical role in the successful inclusion of individuals in the community and workplace environments (Carnahan, Hume, Clarke, & Borders, 2009). As independence and mastery develop over time and individuals are able to perform daily activities at home or in the workplace, they may in turn feel more empowered or more in control of their lives.

Instruction focused on actively engaging students with ASD through teaching methods that support some of the learning needs of this population should be a priority for educators. In addition to having impairments in communication, social interactions, and restrictive or repetitive behaviors as defined by the *Diagnostic and Statistical Manual of Mental Disorders* (fifth edition, *DSM-V*), individuals with ASD have been described as exhibiting stimulus over-selectivity or impaired focus on the most salient features of objects (Hume, Loftin, & Lantz, 2009; Quill, 1997; Reed & Gibson, 2005), planning difficulties (Bramham et al., 2009), and impairments in verbal information processing alone (Lopez & Leekam, 2003). Supporting these learning difficulties, in addition to capitalizing on reported preferences for visual information as compared to auditory alone (Arthur-Kelly, Sigafoos, Green, Mathisen, & Arthur-Kelly, 2009; Cihak, 2011; Cihak & Schrader, 2008; Quill, 1997), can be addressed through visually cued methods of instruction.

Quill (1997) described visually cued instruction as, "... use of graphic cues as either an instructional prompt to aid language comprehension and communication, or an environmental prompt to aid organizational skills and improved self-management" (p. 704). Such use of visual supports can allow for simultaneous processing of both oral and graphic language, complementing the information processing and memory abilities as well as enhancing joint attention and receptive language in individuals with ASD (Quill, 1997). Video representation is one method of visually cued instruction that has been used to support the instructional needs of students with ASD.

Several literature reviews and meta-analyses have been published, reporting the positive effects that video-based technology can have on skill acquisition, generalization, and maintenance for students with ASD (Ayres & Langone, 2005; Banda, Dogoe, & Matuszny, 2011; Bellini & Akullian, 2007; Delano, 2007; Gardner & Wolfe, 2013; Hume et al., 2009; McCoy & Hermansen, 2007; Mechling, 2005). Video modeling procedures, including basic video modeling, video

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Effects of TWA-Supported Digitally on Comprehension of Students With Autism Spectrum Disorder, Level 1

Sarah K. Howorth[1] and Sharon Raimondi[2]

Abstract

Presenting text in digital format with annotation supports may relieve some of the cognitive load that hinders inferential comprehension for students with comprehension deficits. Science texts are particularly difficult, as the content may not be within the knowledge repertoire of a reader. The purpose of this study was to investigate the effects of using a reading strategy, Thinking before, While and After (TWA) -digitally supported (TWA-SD), on the comprehension of science text by students with autism spectrum disorder (ASD, Level 1) participants. A concurrent multiple probe single subject research design was used to individually deliver intervention. Results indicated the intervention was effective in increasing participants' accuracy and quality of oral retellings of main ideas and details as well as their performance on general comprehension questions. Implications regarding the use of digitally supported strategies to increase access to the curriculum for students with ASD, Level 1 are discussed.

Keywords

autism, exceptionality, tablets/iPad, technology perspectives, reading, content/curriculum area, middle school, age/grade level, universal deign for learning, educational perspectives, small *N*/single subject design, methodologies

An increasing number of students with autism spectrum disorder (ASD) are being included in content area classrooms with their peers, requiring that teachers become familiar with academic interventions to promote their success (Chiang & Lin, 2007). Individuals with ASD exhibit symptoms including social impairments (social interaction and social communication) and restricted and repetitive interests and behaviors (American Psychiatric Association, 2013); diagnostic frameworks recognize significant heterogeneity in functional levels (documented by the presence or absence of co-occurring intellectual and language impairment). One subgroup of children with ASD that has increased substantially in number is children with ASD with no accompanying intellectual impairment is ASD, Level 1. This subgroup is differentiated from others with ASD based on their strengths in cognitive and language abilities. The diagnostic criteria for ASD changed with the publication of the *Diagnostic and Statistical Manual*, version five (*DSM-5*) in 2013 (American Psychiatric Association, 2013). The *DSM*-5 describes three levels of increasing severity based on the levels of support required for daily functioning. The least supports are needed in ASD, Level 1, whereas the most supports are needed in ASD, Level 3. Current estimates indicate nearly half of children with ASD are those classified at Level 1 (Centers for Disease Control and Prevention, 2014). There is a growing research base focusing on evidence-based practices for individuals with ASD that may provide guidelines for general and special educators providing educational programming across a wide range of skills. Although the research is promising, results are often limited when it comes to generalization in diverse vocational and classroom settings (Sartini, Knight, Spriggs, & Allday, 2017).

Autism and Comprehension Deficits

The unique reading profiles of students with ASD, Level 1 provide a challenge to educators delivering instruction in text-rich environments such as middle school where students read to learn more than they need to learn to read. Text comprehension tends to be challenging for students with ASD, Level 1. Despite their strengths, their reading comprehension performance is often hindered by an impaired ability to draw inferences and make cause and effect connections (Estes, Rivera, Bryan, Cali, & Dawson, 2011). These reading difficulties have been documented in a number of studies. For example, Estes, Rivera, Bryan, Cali, and Dawson (2011) tested a sample

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Applying the Curriculum Research Framework in the Design and Development of a Technology-Based Tier 2 Mathematics Intervention

Christian T. Doabler[1], Ben Clarke[2], Allison R. Firestone[3], Jessica E. Turtura[2], Kathy J. Jungjohann[2], Tasia L. Brafford[2], Marah Sutherland[2], Nancy J. Nelson[2], and Hank Fien[2]

Abstract

Mathematics interventions aimed at accelerating the learning of students with mathematics difficulties (MD) should be developed through a design science approach such as the Curriculum Research Framework (CRF). Precision Mathematics is a National Science Foundation-funded DRK–12 Design and Development project focused on building mathematical proficiency with the critical concepts and problem-solving skills of early measurement and data analysis among first- and second-grade students with MD. The Precision Mathematics curriculum incorporates (a) technology-based activities that offer individualized opportunities for instruction and practice and (b) hands-on activities that promote small-group instructional interactions. Our production of the first-grade Precision Mathematics intervention was grounded in the CRF, which involves a series of iterative cycles of development, implementation field-testing, analysis, and revision. Results from initial implementation studies suggest that teachers and students can feasibly implement the first-grade Precision Mathematics intervention in authentic education settings. Challenges faced in developing technology-based mathematics interventions are discussed.

Keywords

curriculum design, explicit mathematics instruction, students with mathematics difficulties, technology-based mathematics interventions

A multitiered system of support (MTSS) is a framework for implementing instructional supports designed to meet the demonstrated needs of a range of learners and to improve established outcomes for all students (Fuchs & Vaughn, 2012; Schumacher, Edmonds, & Ardon, 2017). In most cases, MTSS models emphasize alterable variables that can be purposefully manipulated to maximize student learning and obtain an optimal level of instruction (Fuchs & Vaughn, 2012). In a three-tiered MTSS model, for example, if a student does not adequately respond to Tier 1 mathematics instruction, the goal of Tier 2 is to provide a supplementary mathematics intervention that offers a more targeted learning experience. The intensity of the intervention is further increased in moving from Tier 2 to Tier 3.

In MTSS models, Tier 2 mathematics intervention programs are intended to supplement core mathematics instruction. That is, Tier 2 interventions are provided in addition to Tier 1 instruction to children who demonstrate need for more intensive instruction on the basis of screening and progress monitoring data. In most cases, Tier 2 mathematics programs are designed to target one domain of mathematics, such as whole numbers or fractions (Gersten et al., 2009). When designed and delivered well, these mathematics intervention programs support students' development of mathematical proficiency with foundational concepts and skills. Despite this educational approach being prevalent across the United States, schools face a host of challenges with successfully implementing multitiered service delivery models in mathematics (Schumacher et al., 2017). One challenge is that a growing body of evaluation research suggests that few mathematics intervention programs have been developed and successfully implemented in

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Examining Digital Messaging Applications for Postsecondary Students With Intellectual Disability

Cate C. Smith[1], David F. Cihak[1], Don D. McMahon[2], and Mari Beth Coleman[1]

Abstract

The purpose of this study was to examine the effects of using mobile technology applications to improve digital communication skills in four postsecondary students with intellectual disability. An alternating treatment design was used to compare the effectiveness of three mobile technological applications to improve digital communicative interactions. Digital communication skills included sending and receiving text, audio, and video messages. The results indicate that all students improved the quality and independence of digital communicative interactions. Findings are discussed in the context of teaching the use of technology to improve communication in adults with intellectual disabilities.

Keywords

intellectual disability, mobile technology, communication, postsecondary education

The development of information and communication technologies has already changed our lives significantly and will continue to do so. Daily living skills of students with disabilities also need to meet the requirements of the digital era. However, students with intellectual disability (ID) have difficulty accessing digital tools due to limitations in literacy, language, and motor skills which impact their ability to access information (Alberto, Frederick, Hughes, McIntosh, & Cihak, 2007). Students with ID need specific instruction in this area. A growing number of mobile technologies have been used to teach a variety of skills including academic, communication, and vocational skills to students with ID (Ayres, Mechling, & Sansosti, 2013; Kagohara et al., 2011; Mechling & Seid, 2011). Several studies specifically examined the effects of using the Apple iPhone to improve independence in students with ID. Walser, Ayres, and Foote (2012) used video modeling to teach high school students with ID to navigate the features of an iPhone 3GS. Participants learned to access features such as the camera, videos, and slideshow. Purrazzella and Mechling (2013) expanded upon this idea by teaching adults with ID to take and send video captions of their location to improve safety skills within the community. Digital communication skills are necessary to interact effectively with others in the digital era. Digital communication skills are defined as using technology (e.g., the Internet, phone and tablet applications, and social media) to communicate with others (Cihak, Wright, McMahon, Smith, & Kraiss, 2015). Students with ID need access to technology to develop digital communication skills to achieve independence (Weymeyer, Smith, & Davies, 2005).

Digital Communication

Digital communication skills include the set of skills needed to communicate with others through digital platforms including phones, tablets, and computers (McMahon & Walker, 2014). Examples of digital communication skills include text and audio messaging and sending e-mail. Acquiring and generalizing digital communication skills creates positive benefits for people with ID. It can ease social isolation and advance academic, career, and leisure goals by connecting people with ID to a community of peers and a network of supports (Burgstahler, 2002). One of the most prevalent forms of digital communication is messaging. Messaging is defined as a short electronic communication sent from one user to another (Boyd & Ellison, 2007). In 2011, the number of SMS text messages sent from mobile devices in the United States alone was almost as numerous as the population of the planet exceeding an average of 18 messages per day for every person in the United States (O'Grady, 2012). The importance of messaging as a form of communication is also expanding to dedicated messaging apps. For example, on the popular messaging service

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Digital Tools for the Inclusive Classroom: Google Chrome as Assistive and Instructional Technology

Min Wook Ok[1] and **Kavita Rao**[1]

Abstract

The Google Chrome browser, widely available on computers today, has a variety of free and low-cost apps and extensions that can benefit all students in inclusive classroom settings. Using apps and extensions readily available for the Google Chrome browser, teachers have access to assistive tools that can be useful learning supports for students with and without disabilities. There are apps and extensions available to support literacy, mathematics, and organizational skills. Using these tools, teachers can provide multiple means of representation, expression, and engagement in alignment with Universal Design for Learning guidelines. This article describes how Chrome apps and extensions can be used to support literacy, mathematics, organization, and planning in inclusive settings.

Keywords

Google Chrome, technology, inclusion, universal design for learning

Teachers can integrate digital tools into their instruction to provide learning supports and increase engagement in the classroom (Costely, 2014). Digital devices also can provide essential assistive technology (AT) supports for students with disabilities (Dell, Newton, & Petroff, 2011).

AT is defined 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 functional capabilities of a child with a disability" (Assistive Technology Act, 2004). In the past, AT involved specialized software or devices that were purchased specifically for students with disabilities who needed them. These days, commonly used digital devices have built-in AT features, blurring the lines between instructional technology (IT) and AT (Ok, 2018). Teachers can seamlessly integrate IT tools and employ built-in assistive features, as needed, for students with and without disabilities. For example, most mobile devices have features, text-to-speech (TTS) and speech-to-text (speech recognition; SR), but a decade ago, the features were available only with the purchase of specialized and expensive software. With AT features becoming readily and freely available on devices in the classroom, teachers can make these supports available to all learners, with and without disabilities. For students with disabilities, it is essential to consider and use AT supports as part of the student's individualized educational plan (IEP). However, AT can also be helpful to other learners in inclusive settings, students who can benefit from supports for literacy, mathematics, organization, and planning. For example, TTS is an AT tool that helps students with learning disabilities (LD) to read text (Park, Takahashi, Roberts, & Delise, 2017). TTS can also benefit many other readers including struggling readers who do not have an identified disability, English language learners (ELLs), or students who simply prefer listening and reading at the same time.

The Chromebook is an example of the digital tool that is often used as an IT device and can also be used to provide powerful assistive supports. The Chromebook is a computing device that has been purchased by many schools and districts due to its relatively low cost and portability. Their relatively low cost, physical keyboard (in contrast with tablets that have a virtual keyboard), and ease of management (Gabriel, 2012) make Chromebooks an appealing choice for large-scale purchases. This "ultrabook" computer allows students to access the Internet and use Google's productivity tools such as word processing (Google Docs), spreadsheet (Google Sheets), and presentation (Google Slides) software within the Google Chrome browser environment. Apps and extensions available for the Chrome browser give teachers and students access to various IT and AT features.

In the inclusive classroom, teachers can encourage all students to explore AT features that facilitate learning and

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