Critical Considerations for Teaching Students With Disabilities in Online Environments

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The purpose of this article is to provide teachers and their supporting team (e.g., parents) with an understanding of the implications of blended and virtual learning for students with disabilities. To support these students, it is important to have an understanding of the manner in which a significant majority of blended and virtual learning is delivered for today's K–12 student. Many blended and online programs include resources and tools teachers can use to adapt and extend student learning. This article offers tips, strategies, and resources to the novice as well as a veteran teacher moving to instruct in the blended or virtual learning environment.

Today, teachers are increasingly being asked to teach K–12 students online. Whether in a blended or full online environment, schools are increasingly adopting online options for K–12 instruction (Picciano, Seaman, Shea, & Swan, 2012). For the K–12 teachers and their respective learners, online learning is packaged in two primary formats: blended or fully online (Barbour et al., 2011). Often in a brick-and-mortar environment, *blended learning* is described as learning that is at least in part through online delivery with some element of student control over time, place, path, and/or pace

(Staker & Horn, 2012). *Online learning* refers to K–12 education that is content and instruction delivered primarily over the Internet (International Association for K–12 Online Learning [iNACOL], 2014]). Online learning is often referred to as fully online, virtual learning, cyber learning, or e-learning. For our purposes, we will refer to fully online learning as virtual learning.

For blended learning, the environment might take a number of forms. At the secondary level, students might report to a brick-and-mortar classroom, sit down in front of an assigned computer, log in, complete the lessons and assessment, and when the bell rings, leave for their next class. Others may attend their brick-and-mortar classes throughout the day and then leave school early to complete the online component at home or a convenient location outside of the school building. Increasingly, blended learning, especially at the middle and elementary school, might include a traditional face-to-face class where students complete a portion of their coursework on the computer and another part engaged with their face-to-face teacher or their classmates. The Clayton Christensen Institute for Disruptive Innovation has a thorough description, along with a four-part

visual model, to describe in detail the blended learning model (see http://www.christenseninstitute.org/blended-learning-3).

With virtual learning the student remains at home, or at least away from the brick-and-mortar building, interacting with the content via the computer. At the secondary level, this may be an independent experience where lessons and activities are assigned by the remote teacher and the student completes at a pace appropriate for the curriculum and the needs of the learner. At the middle and elementary level, teachers and often parents are regularly engaged in direct instruction at their home (e.g., parents) or from a distance or virtually (e.g., teacher). The "look" of virtual learning is students spending a significant

portion of the instructional day engaged with online lessons via their computer, tablet, or similar mobile device (Wicks, 2010).

According to iNACOL, the nation's largest entity focused on research, the development of standards, and "supporting the ongoing professional development of classroom, school, district, and state leaders for new online learning models," (2014) blended and virtual learning includes over 1,500,000 students across the country (Wicks, 2010). The significant majority (74%) are at the high school level, but a growing number include middle and elementary experiences (Spitler, Repetto, & Cavanaugh, 2013). Although 24 states and the District of Columbia have blended schools and 20 states have fully online K–12 schools, the single- and multidistrict blended and virtual programs are the fastest growing and represent the largest enrolled segments of the K–12 online learning experiences (e.g., in Arizona, 42,000 course enrolments in the 2012-2013 school year; Watson, Murin, Vashaw, Gemin, & Rapp, 2013). Particular states are at the forefront of online learning, with Florida being the first state to offer virtual and blended options at the elementary, middle, and secondary level. Likewise, the states of Florida, Michigan, Wisconsin, Minnesota, and Idaho are regularly recognized as leaders in offering a wide variety of virtual and blended options for students across most, if not all, grade levels (Watson et al., 2013). States like Ohio (e.g., Electronic Classroom of Tomorrow, ECOT), North Carolina, and Alabama are increasingly adding large segments of their school population, and states like Kansas (over 80 online program options), Utah, Oklahoma, and Louisiana are working to allow students (and their parents) to choose approved/vetted online courses from multiple content providers (Means, Toyama, Murphy, Bakia, & Jones, 2010).

Be it blended or virtual, secondary or elementary, K–12 online learning is here and appears to be a growing option for schools and states. On the front line of this delivery model are teachers. Here, they are often providing instruction in a format (e.g., at a distance, online, computer-based) in which they have not received specific professional preparation. That is, teacher preparation often focuses on face-to-face instruction within the confines of the traditional brick-and-mortar building and classroom. With the tremendous growth of the blended and fully online K–12 classroom, teachers are now expected to instruct students virtually or engage students prior to or after a series of online lessons. These requirements potentially alter skill sets and expectations beyond teacher competency (Hathaway & Norton, 2012).

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For students with disabilities, the blended and virtual learning environment presents opportunities but also considerations for their teachers. For example, recent work conducted on the part of the Center on Online Learning and Students with Disabilities (COLSD; see Box 1: Center on Online Learning and Students With Disabilities) found online teachers of students with disabilities particularly challenged in identifying, developing, and delivering appropriate accommodations to support the diverse learning needs presented in the blended and virtual environments (Center on Online Learning and Students With Disabilities, 2012).

Box 1. Center on Online Learning and Students With Disabilities

Center on Online Learning and Students with Disabilities

COLSD is a research center funded by the Office of Special Education Programs (OSEP) to conduct research on K–12 students with disabilities in online learning and generate promising approaches to the education of students with disabilities in the online environment. COLSD has partnered with the National Association of State Departments of Special Education (NASDSE) and the Center for Applied Special Technology (CAST) to conduct research and analyze policy. Its website, www.centerononlinelearning.org, includes several resources for parents and educators, including:

- blog posts on trends, issues, and discussions in online learning in social media, as well as analysis of white papers;
- a Voluntary Product Accessibility Template (VPAT) table that provides quick access to accessibility information for numerous products used in online learning;
- research-based white papers on legal and technological topics in online learning, with more to be posted soon;
- the results of survey projects conducted by the Center, providing the perspectives of students, parents, teachers, and administrators on online learning; and
- access to the iNACOL Research Clearinghouse for K–12 Blended and Online Learning (k12onlineresearch.org), which the Center regularly supplies with citations of academic articles pertaining to online learning.

Development and Delivery of K–12 Online Curriculum

The current state of blended and more importantly virtual K–12 education is that it is vendor-based or vendor-driven. That is, teachers need to be aware that the content they are required to use and the instruction that follows is based on content and curriculum designed by an outside vendor (removed from their local school district) and adopted to be the primary mode of instruction for the K–12 blended or virtual student. Estimates indicate that over 85% of all K–12 blended and virtual education curricula are developed by for-profit companies or vendors (Queen, Lewis, & Coopersmith, 2011). These vendors develop the curriculum or content and the learning management system (LMS) in which the curriculum is housed and delivered. School districts then purchase access to the curriculum for each of their enrolled students. For example, K–12, Incorporated (K12) is one of the primary developers and deliverers of K–12 virtual learning in the country. Available in all states that provide online learning, K12 (see http://www.k12.com) offers coursework across the four primary content areas (i.e., social studies, science, math, and language arts) and all grades (K–12). Packaged for the learner to log in and begin, K12 provides the student a personalized and independent learning experience dependent solely on the student and the LMS. Of course, the teacher, and increasingly the parent (e.g., virtual learning), is a part of the student learning experience, however, the online product is the primary *teacher* providing the students the content, the lessons, the activities, the assignments, and the assessments. The online lesson dictates student instruction, and the teacher and parent facilitate lesson completion.

A video from Connections Academy, one of these primary vendors (see http://www.connectionsacademy.com), provides the perspective of a day in the life of online learning. Notice that it begins with the family, offers perspectives from the family, and emphasizes the personalization of the learning experience. We share this video to offer the perceptive of virtual learning from one of the primary vendors in the K–12 blended and virtual business (see https://www.youtube.com/user/connectionsacademy). Table 1 offers a further breakdown of some of the more common K–12 blended and virtual developers or vendors providing a brief introduction and their corresponding web addresses.

As mentioned, Box 1 offers information COLSD is finding based on initial work with virtual K–12 schools across the country. From this work, Table 2 offers some misunderstandings that the Center faculty have identified among teachers, district leaders, and parents of children with disabilities specific to virtual K–12 learning. This work is under development for publication but is shared to further contextualize how virtual K–12 learning is potentially altering the educational experience for students with disabilities, their teachers, and the elementary and middle school students, their parent and family interaction, and educational support.

Competency-Based Learning in Online Classroom

At first glance, the independent nature of online learning is quite attractive. Further examination, however, seeks to better understand how individual competency really meets the needs of the student with a disability. That is, what about the student who is performing below grade level in content areas as well as basic development in reading, writing, and mathematics? How does the structure of the vendor-based curriculum and LMS support these learners? Or how is the teacher able to individualize, modify, and/or adapt the curriculum for the learning needs of these students? The answer for many vendors is the idea of competency-based learning. Often used in teaching concrete skills rather than abstract learning, competency-based is where learners work on one competency at a time. The students are then evaluated on the individual competency, and only once they have mastered it do they move on to others. After that, higher or more complex competencies are learned to a degree of mastery and are often isolated from other topics. Of course, if students can demonstrate mastery, they can skip the learning module/experience determined through a learning assessment. This last feature is of particular interest to the independent learners who might be described as typical or even advanced. The ability to skip material they already know is attractive, allowing them to concentrate on new content, something the blended and virtual experience permits (Priest, Rudenstine, & Weisstein, 2012). However, for students with disabilities and their struggling peers, skipping is often not the case, but instead, they are left working through defined learning modules until they reach competency (Patrick, Kennedy, & Powell, 2013).

For example, take a sixth grader with an intellectual disability (Sofia) who is performing at the first grade level in math. Under a competency approach, Sofia would enroll in the first-grade mathematics curriculum completing assigned lessons, embedded activities, and required assessments. Competency would be

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Table 1. K–12 Online Vendors

Provider	Website	Description
K12, Inc.	http://k12.com	One of the largest providers of online learning content, with virtual schools established in many states and custom, usually Flash-based lessons. Aventa, a middle and high school course provider, is a part of K12.
Connections Academy	http://connectionsacademy.com	Provider of K–12 online public and private schools in numerous states. Connections Academy uses an in-house curriculum and lessons.
Edgenuity	http://edgenuity.com	A provider of research-based courses and curricula. Edgenuity provides support for teachers using the blended model of online learning.
Apex Learning	http://apexlearning.com	Provider of standards-based (e.g., Common Core–, NCAA-aligned) online courses and curricula.
IXL	http://ixl.com	A website providing practice in various Pre K-8 skills, as well as some high school math skills. The website generates practice problems for students automatically and uses its SmartScore algorithm to measure student mastery.
Desire2Learn	http://desire2learn.com	A provider with an integrated learning suite that includes online courses, student data analytics, social plug-ins, and portfolio support. Mobile platforms are also supported.
Pearson	http://pearson.com	An educational giant and textbook publisher that supplements its print products with online courses and modules. Its environment provides support for assessment by the teacher, as well as monitored practice.
ODYSSEYWARE	http://odysseyware.com	A provider of 3-12 online courses, writing skills supplement, and diagnostics and assessments. Its course offerings are Common Core–aligned.
Pinnacle Education	http://pinnacleeducation.com	A provider of high school virtual programs, including several brick-and-mortar campuses in Arizona for additional support. For students outside of Arizona, Pinnacle provides a full-time virtual high school with course offerings designed in-house.

determined based on the lessons completed and Sofia's success with the assessments. The personalization of this model is that she is enrolled in content that is at her performance level and will proceed through at a level determined by the content and her teacher. How is this personalized? Sofia is gaining knowledge at her current level and not being asked to complete a modified version of the sixth grade content. She is also able to move at her pace in the assigned curriculum.

Assigning students to grade-level lessons where they are performing appears logical. Sofia, who is struggling with number sense and basic addition, may not be working with ratios and pre-algebra concepts if she is not planning to take a traditional path in mathematics, regardless of the accommodations and modifications provided. With this said, the challenge is that the competency-based approach often ignores or limits strategic and unique specialized instruction required of the student with special needs. Although the first-grade lessons will walk Sofia through critical concepts in a sequential manner, this approach is not specialized to the needs of her intellectual disability. That is, Sofia is performing at the first-grade level (although she is in sixth grade) because her cognitive disability has impacted her ability to learn the essentials of mathematics. If she is a sixth grader, she has experienced number sense and basic addition, at a minimum, since kindergarten. Instead of adapting the content, working on identifying unique strategies to address her pronounced learning need, and supporting Sofia in developing approaches to work and use numbers in her environment (e.g., weather, basic measuring), competency-based virtual learning will move her through the first-grade lessons again until she has gained competency to move to the next grade level.

Let's look under the hood for a moment. The personalized nature of competency-based instruction can often ignore the embedded supports and purposeful instructional interventions that are the cornerstone of special education (e.g., learning strategies). Instead, the philosophy of content-based instruction if used in an online environment should provide students with support for the grade level and student for which it was designed. Therefore, the first grade lesson in an online course is designed for the typical first grader, offering features relevant to the typical first

Table 2. Common Misunderstandings About Online Learning in K–12

Misunderstanding	Current Practices
Fully online learning means that children do all their schoolwork on a computer.	Fully online courses are not completely online but instead feature offline activities and learning experiences. Many courses also rely on offline resources including textbooks, workbooks, and manipulatives. The amount of offline versus online instruction varies from class to class.
The nature of the personalized content makes the online learning experience teacher "independent."	Teachers spend time communicating both synchronously and asynchronously with students and their learning coaches. Synchronous conversation may include webcam communications, text chat, and whiteboards (Wicks, 2010).
Primary school students in fully online schools, including children with disabilities, are able to navigate and interact with their fully online learning "independently."	Because children may struggle to navigate through content, teachers expect that parents will provide their children with support in completing lessons in the appropriate sequence. Parents of primary school children with disabilities often need parents to be with them at all times as they engage in lessons, even when their teachers are working with them during synchronous lessons.
Online curriculum is developed to address all the learning variability of the child.	Teachers expect that parents will make modifications or be able to discuss with the teacher why their children struggled so that teachers can suggest appropriate modifications for parents to make.
Parents of elementary-age children in fully online learning are home but not engaged with their child.	Parents often play a large role both in supporting their children by structuring their time throughout the school day and scaffolding them during each lesson.
Fully online teachers are in contact and offering direct instruction to children every day.	Requirements of online programs differ. Some teachers may communicate with students and parents via phone or text quite often. Some programs require that students communicate with their teacher at least three times per week (Wicks, 2010).
Personalized learning means that each of the children's learning needs are addressed in online learning.	Parents modify content, provide innovative ways of learning material, and suggest alternate ways to show what their child knows.
Online learning differentiates for each child's learning needs.	Teachers may not be able to understand what students can do independently as opposed to what they can do with parental support, which can make designing appropriate lessons and supporting parents with appropriate techniques to use with their children challenging.

grader and not the learner with a cognitive or learning disability. These features might be quite rich in offering visuals to construct and support understanding, audio to assist the nonreader or struggling reader, and embedded supports often needed for the early learner. However, for the student who is a sixth grader with an intellectual disability, the features may not match specific needs and the unique challenges often associated with the disability. Thus, the assumed personalization for the learner is often not unique and/or specific to the needs of the student with a disability but instead is for the first grader for whom it was designed and developed.

Likewise, this competency-based approach demands that the teacher work towards a goal of 80% or better to move to the next level. Progress can certainly be measured by lesson and assessment completion, especially at a predetermined rate of excellence (e.g., 80% items correct). Although this may be accurate for the first grader, it is often an additional limitation for the sixth grader in our example. That is, the functional or adaptive skills the student requires may be addressed without the 80% competency or may still be a need even though typical competency is met. Here, the teacher needs to be able to determine if the first-grade content addresses the

learning needs of the sixth grader. At the end of the day, teachers need to determine whether a vendor-based product developed for a particular student and grade (e.g., first-grade mathematics) is applicable to the learning needs of an older student functioning at a delayed level. The personalization for one student may not equate to personalization for another, especially when adaptive and functional needs are being considered for the student with a disability. The caution here is for the teacher to be aware of for whom the content was developed and what unique needs the student with a disability brings to the online course. Understanding

the student's specific content needs combined with the disability should allow the teacher then to consider the content and the competency-based nature of the course.

Solutions for Teaching Students With Disabilities Online

Although schools often select a primary vendor to deliver the grade-level content (e.g., Edgenuity; see http://www.edgenuity.com/), increasingly supplemental vendors are selected to address the learner variability present among all students, especially those with disabilities. Teachers in the blended and virtual classroom, should be aware of supplemental online resources allowing them to further individualize the learning experience and provide targeted support where and when necessary. For example, if the online lesson offers a limited foundation to the critical concept, struggling students may not be able to connect dots. Instead, they may require further context or an anchor to the new concept. Likewise, other students may require extended practice, multiple means to demonstrate knowledge/competency, explicit instruction that can be reviewed multiple times to gain an understanding and thus mastery.

For the teacher in the blended or virtual classroom, being aware of these resources is critical. When a teacher understands what is available, he or she then has an opportunity to provide a plethora of supports to a struggling learner. Often these resources are hiding in plain sight, and knowing exactly which online resource to use will take a bit of time, primarily in the form of recognizing what resources exist, what they provide, and appreciating how their instructional method aligns with the unique needs of the students being served. Box 2 presents four of the more popular supplemental vendor-based options for the online teacher. These supplemental resources are some of the most popular and, often, most available in schools that offer blended or virtual K–12

instruction. Likewise, these four provide a number of supports applicable to the needs of struggling learners and students with disabilities.

BrainPOP (see www.brainpop.com and Box 2), for example, begins every lesson or topic with a brief interactive cartoon or what some refer to as a video. Here, two characters introduce the concept by answering a student's question. Their explanation is illustrated with images, audio, and scaffolds to assist the learner that needs context and/or a foundation to what is being introduced. The interactive cartoon is then followed by activities and games to further support understanding. Thus, BrainPOP seeks to introduce a critical concept with an anchor and then build upon this context. As a supplement, the learners could either begin with BrainPOP for the foundational connection and then return to their virtual lesson or use the video to extend the initial lesson. Here, the teacher makes the decision based on the individual needs of the learner and the demands of the content.

Each supplemental product is developed to address standards and the common core, and each features a unique learning experience to support student understanding and application, specifically for the struggling learner and the student with a disability. Because online learning is to be individualized and personalized to the learner, the teacher should be involved in making certain the online curriculum provides the needed content and educational approach to support the learner's needs.

Besides vendor-based or for-pay supplemental online resources, there are also open educational resources (OERs) or curricular items created by educators and distributed online for the free use of teachers. Examples of OER items include curricula, lesson plans, study guides, and multimedia presentations. Blended and virtual educators can benefit from using them to supplement online lessons that cannot be modified to suit the reading level of students related instructional needs. Sources of OER include OER Commons (oercommons.org), Curriki

(curriki.org), Ck12 (ck12.org), and Connexions (cnx.org). For the educator, the student, and quite often the parent, especially in the virtual learning experience, knowing what is available and the purpose for the resource is critical to support the struggling learner. Table 3 provides a list of a variety of free and accessible online supplemental resources developed for teachers and students.

Connecting the Old to the New: Tips and Solutions for Online Instruction

Incorporating What Works: Explicit Instruction

In order to bridge the known to the unknown for brick-and-mortar peers, blended and virtual teachers need to realize there is much to apply from brick-and-mortar to the various online options. That is, teaching online does not mean that teachers ignore or forget about effective instruction for students with disabilities. For example, explicit instruction and direct instruction are core features of effective practices, especially for students with disabilities (Hattie, 2009). However, providing explicit and direct instruction when the student is engaged in a virtual lesson might have limitations. That is, the personalization and the independent nature of the learning experience often leaves the teacher as a facilitator, not as someone who provides explicit and direct instruction. There are, however, face-to-face options in both the blended and the virtual experience. For the blended, this may take place before or after the online experience in the brick-and-mortar classroom. In virtual learning, synchronous options are increasingly being used by both teachers and students.

There are numerous technology solutions that provide a face-to-face virtual experience mimicking the direct instruction needed for the student with a disability. Box 3 offers a sampling of some of the free video chat service options available in most virtual classrooms.

Regardless of the product selected, each of these synchronous learning

Table 3. Supplemental Resources for Teachers and Students

Name of Free Resource	URL	General Overview
Thinkfinity	http://thinkfinity.org/	A Verizon Foundation resource for teachers that offers online lessons plans, activities, games, and a host of other resources for teachers to use in face-to-face, blended, and virtual instruction.
readwritethink	http://readwritethink.org/	A collaboration between the International Reading Association and the National Council of Teachers of English
illuminations	http://illuminations.nctm.org/	Developed by the National Council of Teachers of Mathematics, this site offers lessons, activities, games, and a host of resources for students to further expand their knowledge in the area of mathematics.
OER	http://oercommons.org/	Open Educational Resources developed and available for teachers to use with students aligned with the Common Core and addressing content resources across a number of instructional areas.
Curriki	http://curriki.org/	This site offers free learning resources developed by teachers to be used by teachers for student learning in blended and virtual learning.
Ck12	http://ck12.org/	Ck12 is a foundation centered on the development of resources specific to the STEM content. They also collect and organize these resources for teachers and students.
Connexions	http://cnx.org/	Connexions is a digital repository and content management system for educators to access and use.

Free Video Chat Service Options

Service	Link
Skype	https://education.skype.com
Google Hangouts	http://google.com/+/learnmore/hangouts
Jitsi	https://jitsi.org
Facebook Video Chat	https://facebook.com/videocalling
Meetings.io	https://meetings.io
Utilize the built-in video chat for your LMS, if applicable (i.e., Blackboard Collaborate)	

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Box 3. Tips for Successful Video Chats

Plan Ahead

Preparation	Cue up video or documents, ensure you and your video counterpart have plug-ins and equipment (mics, camera).
Test your equipment	Ensure that your camera, microphone, and screensharing are functioning properly.
Consider location	Although you can conduct a video chat from Starbucks, it's better to be in a quiet room alone so that your student has privacy and you are not being interrupted by distractions.
Surroundings	Beware of lighting: don't put your back to a window with sunlight making you a silhouette; make your background a solid wall or slightly decorated bookshelves (think about interviews on TV).
Reminder email	Include connection time and instructions for download and/or connection (i.e., have the video chat software open, get logged in, and ready for incoming call).

During Call

Utilize chat	If you and your student have any technical difficulty with cameras or microphones, utilize the text chat feature of your service to communicate status or tips for turning on features.
Eye contact	Remember where your camera is and try to place the incoming video stream as close to the camera as possible so that it feels more to your *student* that you are looking at *them*.
Quiet space	Beware of external noises including voices, television, barking dogs, and loud appliances such as fans or dishwashers.
Headset	Although not always necessary, a set of ear buds can help you and your student avoid a feedback echo.
Verbal cues	If you are planning to share your screen, show a video, or otherwise change your video, offer your students cues to let them know how their screen will change so that they are not surprised by changes.

tools offer video, audio, and also a place to chat or a place to type and thus share ideas via text. Most offer the capability of the teacher to share his or her desktop, allowing the student to see a teacher presentation, video, or other digital material he or she wants to offer the student. Consider a video conferencing platform that meets your needs and those of your students and parents. Two examples, group Skype (www.skype.com) and Google Hangout (http://www.google.com/+/learnmore/hangouts/), are free for educators and allows teachers to initiate a call with up to 10 participants. In addition to this list, most LMSs have built-in video chat options, which save

Teaching online does not mean that teachers ignore or forget about effective instruction for students with disabilities.

users from downloading additional plug-ins and creating new accounts. Box 7 offers additional tips for conducting successful video chats with your online students and parents.

Take, for example, a virtual teacher attempting to support social skills development among students with disabilities. First, the teacher needs to consider that some of his or her students most likely selected online learning because of bullying and other social challenges experienced in the brick-and-mortar classroom. Taking them out of the face-to-face environment offered relief; however, it did not necessarily create a place for them to develop the social skills needed in the community or in future learning experiences. Using Blackboard Collaborate (see https://www.blackboard.com/platforms/collaborate/overview.aspx), for instance, a teacher might meet weekly for 30 to 60 minutes with a group of three students all with social skills deficits. Here, the teacher might require students to at least turn on their audio and talk with him or her and their peers during the experience. Part of the class focuses on explicit instruction where he or she provides specifics on social skills development. Students are then asked to practice a number of different activities where they are engaging their peers in communication that mimics effective social interaction. The teacher listens and offers corrections and feedback when necessary. He or she actually takes this further by supporting parents who are there listening to their son or daughter engage in the social interaction and provides both the child and parent directions or follow-up practice in their home and community environment. Further, the teacher asks the students, and when appropriate the parents, to videotape the student engaged in social interactions in the community setting and then conducts a shared observation with the students, where they can watch the video together and reflect on and strategize for future interactions. This could work just as well with practice videos where the teacher and student watch a different student in social situations

Box 4. Text-to-Speech Application Options

Text-to-Speech Program	What Is It?	Key Features	Link
Read&Write Gold	An all-in-one accessibility toolbar for the desktop and Google Chrome	Dual-color highlighting, text-to-speech, and optical recognition of inaccessible text; speech-to-text input, input correction, and spell check; quick access to a calculator and graphic organizer	http://texthelp.com/North-America/Our-products/Readwrite
Premier	A text-to-speech program that can be run from a flash drive	Narration of text from mouse position, class resources and notes storage, highlighting, PDF reader	http://readingmade easy.ca/products/PurchaseProducts.php? V = W
Read:OutLoud	A text-to-speech suite marketed for whole-school use	Built-in accessible browser, conversion-free NIMAS support, allows students to produce bibliographies and text outlines quickly and automatically	http://donjohnston.com/readoutloud/
NaturalReader	A standalone screen reader application specializing in providing natural-sounding synthetic voice	Floating toolbar to read text in various applications, several natural-sounding voices across various dialects, educational license available	http://naturalreaders.com/
Kurzweil 3000-firefly	universal design for learning (UDL) and Common Core–aligned suite of literacy tools	Translation and ELL support, note taking and study tools, Firefox browser plug-in, quick access to dictionaries, thesauri, and other reference materials	http://kurzweiledu.com/kurzweil-3000-v13-windows.html
Wynn	A text-to-speech program with OCR capabilities to read text that can't normally be highlighted	OCR for PDFs, Flash, scanned-in pages, etc.; highlighting, spell check, and reference tools	http://freedom scientific.com/lsg/products/wynn.asp

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Box 5: Bookshare Features

Bookshare (Bookshare.org) is a digital library of materials accessible to individuals with print disabilities. To date, its holdings include over 200,000 digital books, including textbooks, literature, and novels commonly used in K–12 learning.

✓ Access to Bookshare requires either an individual or organizational membership, which you can apply for on Bookshare's website. Membership is free to U.S. educators and students with qualifying print disabilities, or disabilities that impede students' ability to read print text.

✓ Members of Bookshare can download DAISY and BRF format files for any of the books in Bookshare's library. These files are compatible with most text-to-speech players and screen-reading software.

✓ Students can use Read2Go and Go Read, two applications from Benetech, to read materials from Bookshare on their Apple and Android devices. Details can be found on Bookshare's website.

✓ Bookshare's holdings include classic classroom literature (Charlotte's Web, Little House on the Prairie) as well as recently published novels and books on the New York Times' best seller list. Users can search the entire library by genre, category (fiction, nonfiction, best sellers), publication date, and more.

and strategize on his or her behalf, thus removing the student as the focus. Through the right technology tool, the virtual classroom does provide the opportunity for direct and explicit instruction for the student who requires it.

Accommodating Text

Although text-to-speech (TTS) may not be the only intervention needed by the struggling reader, TTS has been shown to be helpful to the individual with reading challenges (Roberts, Takahashi, Park, & Stodden, 2012). Box 4 lists some of the more popular or prominent TTS applications available to students and teachers.

Similarly, Bookshare (see http://www.bookshare.org and Box 5) is a digital repository for over 200,000 digital books, essays, and related educational resources available to individuals with disabilities, especially those who are print impaired.

For blended or virtual teachers, they need to be aware of not only the resources but also how these text-to-speech resources are to be used by their students in order to access and understand the text. Fortunately, more and more text is becoming digital but also accessible to be read by the text-to-speech applications. Online teachers need to also consider which of the text-to-speech applications might be helpful to ensure a student uses them daily to access online content. For example, the Kurzweil 3000 TTS program (see http://www.kurzweiledu.com/kurzweil-3000-v13-windows.html) also includes highlighting features and allows students to annotate texts. Increasingly, TTS developers are adding features that expand beyond transferring the text-to-speech and instead embedding supports that are critical for the struggling reader. Highlights, identifying the main idea, choice of a variety of voices from which to choose, and similar elements will be necessary to review in order for the teachers to make the right recommendation on which the TTS product is appropriate for the learners

with whom they are working. Remember that a number of TTS products are free or embedded in the Internet browser the student might use. Thus, the teacher and the student need support and training from online teachers to better understand what features are critical to successfully read the material in the online environment.

For younger students, Voki (see Box 6) is an excellent choice for TTS. The Voki website is free and contains a utility that lets instructors and students create characters who can either speak aloud text using a text-to-speech utility or play back recorded dialogue. Because text that is not selectable (i.e., text that cannot be copied and pasted) cannot be entered into a TTS without the use of screen-reading software, the ability of teachers and parents to record their own voice into Voki is quite useful for making lessons with nonselectable text more accessible.

Conclusion

The growth in K–12 blended and virtual learning environments indicates that students with disabilities will increasingly be exposed to or engaged in these learning options. For the teacher, and increasingly the parent, instructing students with disabilities using blended and virtual learning presents advantages as well as challenges. These changes call for new tools and new solutions to be considered and implemented for the student as well as the teacher. Understanding the parameters of current blended and virtual learning options is critical if the teacher is to identify what students need and how to deliver the supports to students with disabilities. One of the primary considerations is understanding and appreciating the landscape of blended and virtual learning when it comes to the content that is being offered and who is developing and the structure in which it is being delivered. Understanding the foundational content allows for teachers to then appreciate the supplemental resources and other tools and accommodations that need to

be provided to ensure success for the student with a disability.

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