WCASS Guide: How to Provide Students with IEPs Access to their Grade Level Curriculum through Text to Speech

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WCASS thanks the WI Department of Public Instruction for their review of this guidance to ensure compliance with IDEA 2004 and promote student access to grade level curriculum

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Executive Summary

Many students with IEPs have an ever-growing gap between their achievement scores and grade level expectations. The graphs in the next few pages only tell part of the story. They do not express the level of frustration, for example, felt by 4th grade students with IEPs who read at the 1st grade level and who are not able to meaningfully participate in classroom discussions that are based on 4th grade reading level books.

It is no surprise that with each passing year the gap widens, and the frustration turns sometimes to anger, withdrawal, behavioral issues, and even dropping out of high school.

Traditional reading interventions are often designed to address important areas for reading development including phonemic awareness, phonics and fluency. While systematic instruction benefits many children, there is a group of students who may never achieve the levels of speed, fluency, and accuracy required for their grade level. The problem is one of information processing: by the time they have successfully decoded a word, they have little to no energy or cognitive capacity left to solve the word, let alone make sense of it, and then do something with it.[1]

The Text To Speech technology which reads digital text aloud, provides instant access to all sorts of instructional materials including textbooks, articles, websites, newspapers, and even instructional materials prepared by the classroom teacher. **Providing Text To Speech for students allows them to gain access to grade level reading materials.** Listening to text enables students to gain new information and expand their vocabularies when students have access to information, at or above grade level, they can participate in classroom discussions and feel part of the group, both academically and socially. In addition, providing Text To Speech for students is also an **education equity issue**, ensuring that **every student** has access to the educational resources and rigor they need at the right moment in their education. This may stop the cycle of frustration, anger and

[1] https://www.learninglandscapes.ca/index.php/learnland/article/view/Text-to-Speech-Technology-as-Inclusive-Reading-Practie-Changin-Perspectives%2C-Overcoming-Barriers/618

withdrawal for many of these students. It is imperative that students, educators, and parents explore the possibilities of Text To Speech in order to determine whether this form of assistive technology helps them achieve.

In IDEA 2004 legislation, Congress established the National Instructional Materials Accessibility Center (NIMAC) to help states work with Accessible Media Producers such as Bookshare or the American Printing House (APH) so students can gain access to their grade level materials and curriculum. Unfortunately, many teachers around the country are unaware of the IDEA 2004 provision of NIMAC, Accessible Educational Materials (AEM), Text To Speech or Audiobooks for students with IEPs.

This publication serves as a guide to why and how to provide students with IEPs access to their grade level curriculum using Text To Speech. Contents include:

- The failing academic performance of Students with IEPs;
- The IDEA 2004's requirement that school districts provide Free Appropriate Public Education (FAPE) to students with IEPs to ensure that more than 'minimal progress' is gained from year to year (Supreme Court interpretation of the FAPE standard in Endrew F.). The perspective of a school attorney and a parent's attorney is presented;
- The experiences of a 13-year-old boy;
- The experiences of a mother and advocate;
- The views of Dr. Alexa Posny, former U.S. Assistant Secretary for Special Education and Rehabilitative Services, and Dr. Thomas Hehir, former Director of the U.S. Department of Education, Office of Special Education Programs (OSEP);
- AEM / Text To Speech and Print Disability;
- IEP teams record "Print Disability" and "Text To Speech" in the IEP form;
- Review of publications calling for the use of Text To Speech / Audiobooks;
- Text To Speech and reading instruction can co-exist;
- Classroom use of Text To Speech applications / tools and Audiobooks;
- The use of Text To Speech in statewide assessments;
- Important information for parents.

Any student, regardless of identification, should be able to access the opportunities afforded in Text To Speech from the start of a learning experience. This aligns with Universal Design for Learning (UDL), as it anticipates learner variability from the start and provides flexible opportunities for any student to access the text, regardless of identification status. (In other words, students should not have to wait to be identified to have these opportunities.)

Final Comment

The goal of this publication is to ensure that all students who need Text To Speech tools will be identified early and have routine access to the tools and skills to access their grade level curriculum, to close the achievement gap, and ultimately to graduate from high school college-and career ready.

Introduction by Dr. Thomas Hehir

Thank you WCASS organization for embarking on this critical issue for so many students with disabilities around Wisconsin and the Country!

It is disappointing to note that while IDEA 2004 provides opportunities for students with disabilities to access and progress in the general curriculum by using Accessible Educational Materials (AEM) such as Text To Speech, this provision is significantly underused by educators around the country.

Dr. Thomas Hehir, Former U.S. Office of Special Education Programs (OSEP) Director

As I wrote in my 2015 book *"How Did You Get Here*", I had just taken a teaching position at Harvard after years of working in the field of special education, most recently as the Director of the Office for Special Education Programs (OSEP) for the U.S. Department of Education. I was pleasantly surprised to find many students with disabilities, including dyslexia enrolled in my classes. I wanted to hear their stories on how they are functioning at Harvard with dyslexia, among other questions. After all, I considered this to be my life's work - expanding educational opportunities to students with disabilities. I had examples right before my eyes. I expected to hear triumphant stories of effective IEPs. Not quite. While it was true to some extent, it was not the whole story. These students are succeeding at Harvard by relying on Text to Speech or Audiobooks, the technology that was not afforded them in their respective schools growing up. This is disappointing, since IDEA 2004 does mandate the use of Accessible Educational Materials (AEM) for students with disabilities to access and progress in the general curriculum.

These students experienced challenges and barriers in navigating the massive amount of reading assignments at Harvard. They needed to find a 'different way' as they told me. 'Text To Speech' was that 'different way'. One of my students, Eric, developed a clearer understanding of himself as a dyslexic person, and what he needed to be successful. He

said “I learned after my Masters here that I need to go up to the faculty at the beginning of the semester, introduce myself, explain that I am dyslexic, and explain what that means. Mostly it means that I am going to have digitized text for any classroom reading assignment. I will have my computer, plug in my headphones, I can listen to it, and we will be all set”. Eric continued “Everything is Text to Speech”.

Another one of my students, Laura was diagnosed with dyslexia at age seven and struggled with reading growing up attending a Montessori school. She said “I knew I wasn’t reading as well as the students in the class. I recall other students snickered when I read aloud. I remember feeling upset that I read books that were at the same level as the younger kids in the classroom rather than my friends”. Laura continued, “…my parents would get my sisters to read aloud and tape-record books for me so I would continue to get access to books”. Laura’s parents had the right idea in creating audiobooks to support children with dyslexia, a strategy that has been used by the Learning Ally Company for over 70 years.

Many students with reading disabilities receive inappropriate instruction that exacerbates their disabilities. For example, while requiring these students to engage in grade level reading materials, they are not provided with the IDEA 2004 Accessible Educational Materials (AEM) such as the use audiobooks, or Text To Speech. This is a violation of the Free Appropriate Public Education (FAPE) provision in IDEA 2004.

I am grateful to the Wisconsin Council of Special Services (WCASS) for taking this initiative. It is my hope that the readers of this WCASS publication will see the value of providing students with disabilities access to grade level materials through the use of either Text To Speech or audiobooks like Laura’s parents did. Laura is now an adjunct lecturer at the Harvard Graduate School of Education, a Senior Education and Disability advisor on the Committee on Education and Labor, and worked for the White House’s Domestic Policy Council and the Senate Health, Education, Labor and Pension Committee in the Obama administration. Laura is also my co-author on the book “*How*

Did You Get Here" where we insxcluded all our interviews with students with disabilities attending Harvard.

Laura's success reflects the intent of IDEA 2004 in establishing the National Instructional Media Access Center (NIMAC) to ensure that AEM such as audiobooks and Text To Speech are available to students with dyslexia and other reading disabilities through Accessible Media Producers (AMPs). This is what FAPE is all about. We need other students with disabilities to achieve their true potential like Laura has.

Credit: Don Johnston Incorporated

Reflections on Public Policy and a Call for Action by Dr. Alexa Posny

I would like to thank the WCASS organization for the invitation to share my perspective on this important issue.

Schools Must Provide Students with Disabilities Access to their Grade Level Curriculum through the use of Accessible Educational Materials (AEM)

Dr. Alexa Posny, Former U.S. Assistant Secretary for Special Education and Rehabilitative Services

The reauthorization of IDEA in 2004 mandated that students with disabilities have access to, are involved in, and make progress in the general education curriculum. To achieve this goal, Congress established the National Instructional Materials Accessibility Center (NIMAC) as the national repository for the National Instructional Materials Accessibility Standard (NIMAS) source files. These source files, labeled Accessible Educational Materials (AEM), include Text To Speech, Audio files, Large Print and Braille, to name a few. Through their use, Congress intended for students with disabilities to access and make progress in their general education grade level curriculum through whatever tool, method or material that may require.

The purpose was to ensure that timely access to appropriate and accessible instructional materials is inherent in a public agency's obligation under IDEA to ensure that a free appropriate public education (FAPE) is available to all children with disabilities to enable them to participate in the general curriculum with their Individualized Educational Programs (IEPs). As a result, NIMAS requires State Education Agencies (SEAs) to

ensure that public agencies take all reasonable steps to provide those materials at the same time as other children receive instructional materials. Local Education Agencies (LEAs) are responsible for ensuring that children with disabilities who need instructional materials in accessible formats, but who do not fall within the definition of children who are eligible to receive materials under this regulation, must also receive them in a timely fashion.

Unfortunately, the vast majority of students with disabilities around the country are not being provided with AEM to access their grade level curriculum. Instead, the gap between their achievement scores and grade level achievement expectations is growing wider. What we know is this:

1. Based on OSEP reports to Congress on the implementation of IDEA of this WCASS publication), more than 80% of students with disabilities are not proficient in math and reading (the current subject areas reported by OSEP).

2. Based on Wisconsin Statewide Assessments (Forward Exam, ACT Aspire and ACT Statewide), over 80% - 90% of students with disabilities have scored at the non-proficient level in Reading, English Language Arts, Math, and Science (see page 18 of this WCASS publication).

3. Such low proficiency scores indicate that students with disabilities around the country are unable to access and progress in their general education grade level curriculum.

4. The vast majority of the 7.1 million students with disabilities across the country are classified as being part of the high-incidence group, which includes Specific Learning Disabilities (SLD), Other Health Impaired (OHI) and Speech and Language (SL). Only a negligible number of these students are reported to be provided with AEM such as Text To Speech or audiobooks. In other words, the vast majority of the over seven million students with disabilities are denied IDEA 2004's own mandated NIMAS source files materials (AEM) to be able to access and progress in the general curriculum.

5. With so many students with disabilities not performing at the proficient level, it highlights school districts' responsibility to provide the key provision of IDEA 2004, namely FAPE. The U.S. Supreme Court defined FAPE in the Endrew F. decision on March 22, 2017 and clarified that for all students, including those performing at grade level and those unable to perform at grade level, a school must offer an IEP that is "reasonably calculated to enable a child to make progress appropriate in light of the child's circumstances." Additionally, where a child is "…fully integrated in the regular classroom, an IEP typically should...be reasonably calculated to enable the child to achieve passing marks and advance from grade to grade."

6. IEP Teams should consider the use of Text To Speech/Audiobooks for students with disabilities when a **gap** is emerging between students with disabilities' achievement scores and their grade level achievement expectations. Please see the section on *When to Introduce Text To Speech*, which provides guidance for IEP teams on how to balance reading instructions with the use of Text To speech at different grade levels.

7. Determination of the effectiveness of Text To Speech and other such tools/methods for every single student with a disability may differ, yet not considering its use through the IEP process (when there is an achievement gap), places the school district in legal jeopardy.

8. Requiring IEP teams to consider the use of AEM when there is a gap between the student's achievement and grade level expectations, assists school districts in achieving two important results:
   - Provide most, if not all of its students with disabilities access to, engagement in and progress in the regular curriculum.
   - Avoid any or all legal repercussions associated with not using IDEA 2004's own remedy for students with disabilities to access the general education curriculum.

CEC - Council for Exceptional Children Endorsement

The Council for Exceptional Children (CEC) is the largest international professional organization dedicated to improving the educational success of children and youth with disabilities and/or gifts and talents. We accomplish our mission through advocacy, standards and professional development. Our Policy and Advocacy' Position Statements address the importance of students with disabilities having access to grade level curriculum as required by the IDEA 2004 legislation.

Dr. Dennis Cavitt
CEC President

In establishing the National Instructional Materials Accessibility Center (NIMAC), Congress intended for students with disabilities to access and make progress in their general education grade level curriculum. This is a fundamental Free Appropriate Public Education (FAPE) principle. When a gap is emerging between Students with Disabilities (SwD) achievement scores and grade level expectations, IEP teams need to consider the use of such accessible tools as Braille, Audio Files, Large Fonts or Text To speech in order to provide SwD access to grade level curriculum.

The *WCASS Guide on How to Provide Students with IEPs Access to their Grade Level Curriculum through Text To Speech* details information for teachers such as where to obtain these accessible tools and how to use them in the classroom. The CEC organization endorses this publication and encourages teachers to use it.

CEC – ISET Endorsement Statement

Dr. Tara Kaczorowski
ISET President

The executive board of the Innovations in Special Education Technology (ISET) division of Council for Exceptional Children (CEC) is happy to endorse this thorough WCASS guide for providing students with disabilities access to their grade level curriculum through Text To speech technology. Our organization focuses on providing educators, professionals, and families with innovative technology-based solutions to assist individuals with exceptional educational needs. Text to speech has become a ubiquitous feature within most operating systems and many educational technology platforms. As technology is increasingly utilized to complete assignments through universal structures for all students, text to speech accommodations can be easily embedded into daily instruction.

The ability to decode grade level text is essential across all content areas. Text to speech can address decoding/fluency needs and recognition of sight words so the student may utilize comprehension strategies. Any student, with or without disabilities, can utilize text to speech to decode unknown words. When combined with additional features like online dictionaries to aid in understanding, students may be given the opportunity to be more independent in their learning.

To qualify for access to Accessible Education Materials (AEM) available through organizations like Bookshare and Learning Ally, a student must be identified by the IEP

team as having a print disability. ISET endorses a broad definition of what is considered a print disability. Certainly, a student with a physical disability limiting their ability to hold a book or turn a page qualifies. A student with vision impairment easily qualifies for AEM. Students with specific learning disabilities also thankfully qualify and benefit from these resources. We celebrate these efforts. We also believe that AEM eligibility should be expanded to students with other disabilities who are reading below grade level that have other primary or solo eligibility categories. A student with an autism diagnosis who is reading three grade levels below could also benefit from these flexible tools for accessing content. A student with an intellectual disability can benefit from Text To Speech tools supporting their access to grade level academic content. ISET supports the use of technologies like Text To Speech within a Universal Design for Learning framework as an option for all students, and as a requirement for some students. Barriers to learning are often the result of instructional choices of process, product, and content rather than qualities inherent in our learners. Providing multiple means of representation of grade level text via Text To Speech is one strategy to help dismantle those barriers.

CEC - CASE Endorsement Statement

The Council of Administrators of Special Education (CASE) is an international professional educational organization which is affiliated with the Council for Exceptional Children (CEC) whose members are dedicated to the enhancement of the worth, dignity, potential, and uniqueness of each individual in society. Those who receive special education services are individuals who possess basic rights and responsibilities, and who command respect at all times. Special education embraces the right to a free appropriate public education (FAPE) that entails all students to having access to their grade level curriculum. For that purpose, IDEA 2004 legislation established the National Instructional Media Accessibility Center (NIMAC), a national repository that includes accessible formats such as Text To Speech, Audio Files, Large Print and Braille. IDEA 2004 mandates the use of these accessible formats by Individual Education Program (IEP) teams.

Phyllis Wolfram
CASE Executive Director

If Students with Disabilities (SwD) are not able to access their grade level curriculum and a gap is emerging between their achievement scores and grade level expectations, IEP teams must consider the use of the above accessible formats that will provide SwD accessibility to their general education curriculum. This WCASS Guide provides relevant information to teachers about a wide range of Text To Speech tools and applications, where to obtain them and how to use them in the classroom.

The CASE organization thanks the Wisconsin Council of Administrators of Special Services (WCASS) for developing this publication and endorses its use by teachers.

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Why Develop this Publication?

Multiple reasons inspired the 60-member WCASS Stakeholders group to collaborate in the creation of this publication. The main reasons are:

- Because of failing academic performance of students with IEPs. Many are often not enabled to be involved in and make progress in the general education curriculum.

- Because it's the law, IDEA 2004 requires school districts to enable students with IEPs to be involved in and make progress in the general education curriculum.

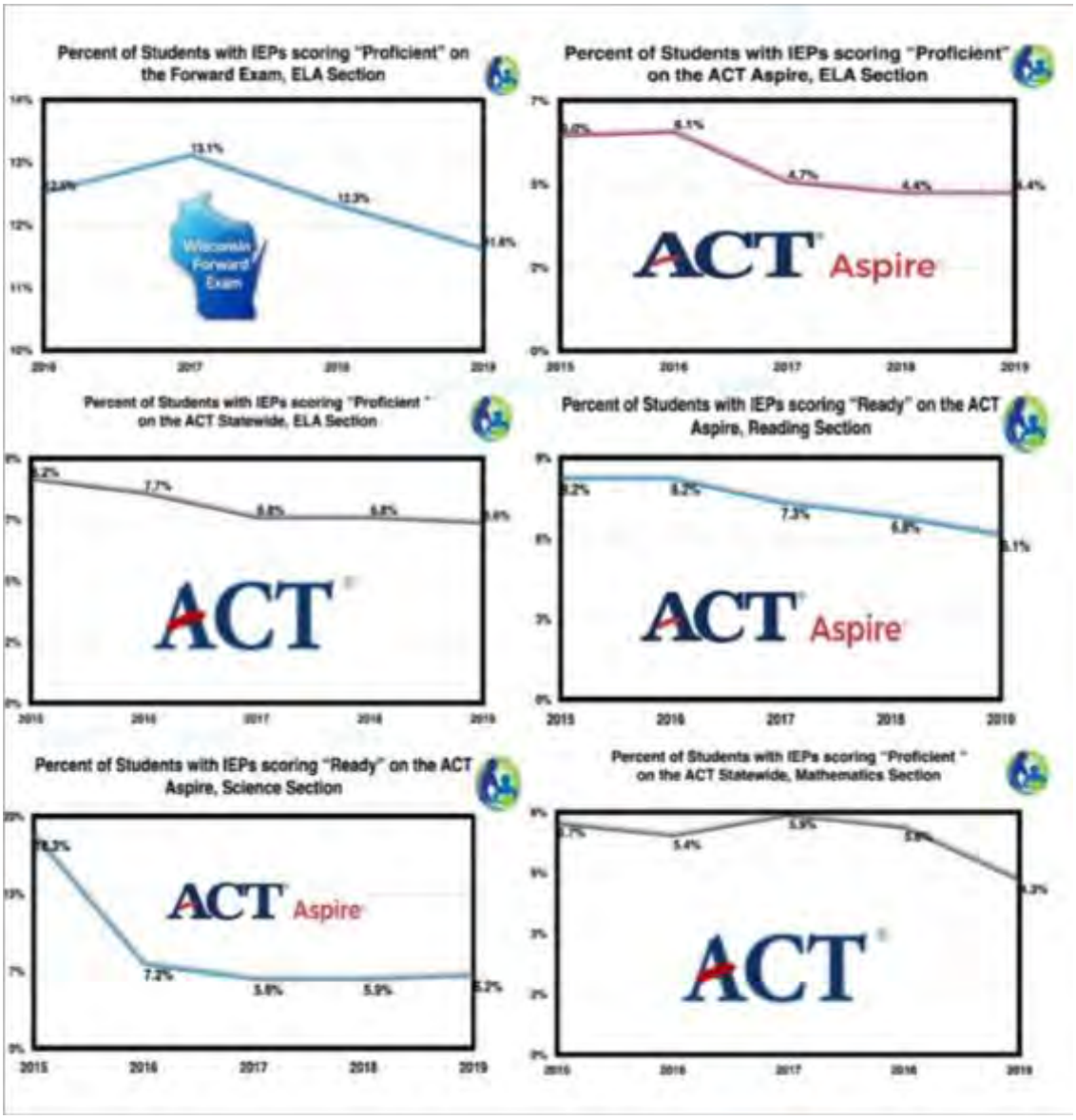
- Because of user statistics from national Accessible Media Producers (AMPs). User data suggest that very few students with IEPs are provided with Accessible Educational Materials (AEM), and use them only sporadically.

- Because of difficult experiences expressed by students accessing their regular education curriculum, and concerns expressed by their parents about evolving mental health issues.

All these reasons are detailed in the following pages.

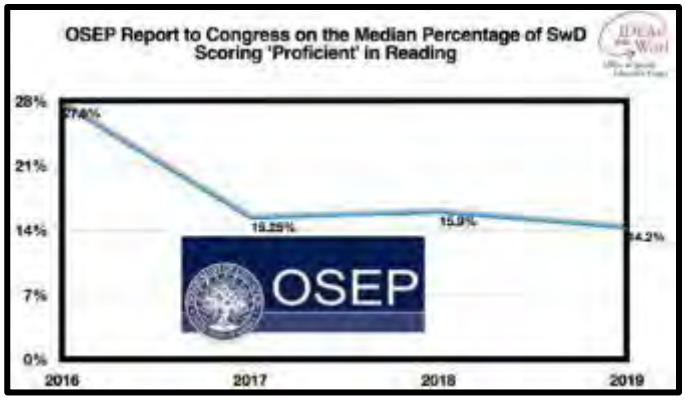
Because of Failing Academic Performance

Since the 2015 introduction of the current statewide assessment tools (Forward Exam, ACT Aspire and ACT Statewide), over 80% - 90% of students with IEPs have scored at the non-proficient level in Reading, ELA, Math, and Science. Scores have continued to decline in these areas over time. See the graphs below:

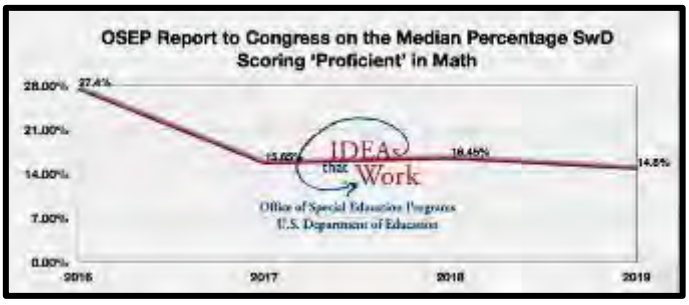


Based on the Office of Special Education Programs (OSEP) Annual Reports to Congress on the Implementation of IDEA, about 80% of Students with Disabilities (SwD) are not proficient in either Math or Reading. No other subject areas are reported by OSEP. National scores also show a decline over time.

Students with IEPs, who are not able to access grade level curriculum due to reading barriers, will have significant difficulties in performing on statewide assessments as can be seen in the Wisconsin and OSEP graphs.



Many of these students who demonstrate poor academic performance, may also have a "Print Disability", and may greatly benefit from and be in need of "Accessible Educational Materials (AEM)" such as "Text To Speech". IDEA 2004 mandated the use of AEM to provide access to their grade level curriculum. While AEM and Text To Speech are part of Free Appropriate Public Education (FAPE) in IDEA 2004, unfortunately, these terms are not widely known or used by educators around the country.



In summary, these failing academic scores suggest that SwD do not access their regular education curriculum. This publication suggests that by using AEM such as Text To Speech, many of these SwD will have access to their regular education grade level curriculum, as required by IDEA 2004. The *2020 Wisconsin DPI Bulletin 20.02 on Legal Requirements for AEM*, provides guidance to IEP Teams on where to document in the IEP that the student has a Print Disability and is need of AEM.

Because it's the Law: The Perspectives of Two Attorneys

Parent Attorney Jeff Spitzer Resnick

School Attorney Mary S Gerbig

Print Disabilities and the FAPE Standard

By:

Mary S. Gerbig and Jeffrey Spitzer-Resnick

Background:

In 2017, the Supreme Court, in a case known as *Endrew F.*, clarified the standard for determining whether or not a school district has met its obligation to provide a student with disabilities a free appropriate public education (FAPE). In that case, the Court states that "Endrew's IEPs largely carried over the same basic goals and objectives from one year to the next, indicating that he was failing to make meaningful progress toward his aims." When the school presented Endrew's parents with an IEP that was pretty much the same as the past ones, they removed him from public school and enrolled him in a private school specializing in educating children with his disability-autism. Fortunately, Endrew did much better at the new school and he made progress "that had eluded him in public school." Endrew's parents sought to have his school district reimburse them for the cost of his attendance at the private school.

Acknowledging that prior case law had left the standard for delivering FAPE somewhat unclear, the Supreme Court clarified the standard, by stating that, "a school must offer an IEP reasonably calculated to enable a child to make progress appropriate in light of the child's circumstances." The Court went on to say that, "[T]he IEP must aim to enable the child to make progress. After all, the essential function of the IEP is to set out a plan for pursuing academic and functional advancement." As the Court noted, **"[A] substantive standard not focused on student progress would do little to remedy the pervasive and tragic academic stagnation that prompted Congress to act."**

The school district must provide the child with instruction and services that allow him to "progress in the general education curriculum." For the first time, the Court added the

requirement that the child's IEP must be "**appropriately ambitious**" because "**every child should have the chance to meet challenging objectives**." The Court further emphasized that, "this standard is markedly more demanding than the 'merely more than *de minimis*" standard that had been applied by the Tenth Circuit. The Court made clear that a student offered an educational program providing "merely more than *de minimis"* progress from year to year can hardly be said to have been offered an education at all….[R]eceiving instruction that aims so low would be tantamount to "sitting idly…awaiting the time when they were old enough to drop out."(Quoting the prior Supreme Court case defining FAPE, *Board of Ed. of Hendrick Hudson Central School Dist. v. Rowley* (1982).

In a recent Wisconsin case, *Grafton School Dist. v. J.L.,* the federal district court ordered the school district to pay for two years of private school reimbursement to J.L., who was an 11th grade student with learning disabilities, writing at a 3rd grade level. The federal court found that, "[I]t is not enough that an IEP be adequately written; it must also be adequately implemented… A child's lack of educational progress in an area the prescribed service was intended to target may be probative that there has been more than a minor shortfall in the services provided."

Application of FAPE to Print Disability:

The term print disability does not refer to any of the thirteen disability categories identified in the Individuals with Disabilities Education Improvement Act of 2004 (IDEA '04) for purposes of student eligibility. Rather, it is a term used to identify students who qualify for accommodations under a variety of the disability laws such as Sec. 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act and the Individuals with Disabilities Education Act. Students with disabilities under a variety of the IDEA eligibility categories may have disability related needs that require accommodations for various types of print disabilities. Students with vision disabilities are not the only students who may have print disabilities. Students with high or average intellect, but who also struggle with ADHD, anxiety disorder and/or dyslexia may all have forms of print disabilities. The

various types of disability related needs may be accommodated in a variety of ways, such as by access to alternate text formats.

A print disability may be understood by considering how the student interacts with printed materials. A student with a print disability is one who is unable to gain information from printed materials at an anticipated level for their grade, and needs alternative access or an accessible format (i.e., Braille, Large Print, Audio, Digital text) to gain information from and use those materials. Print disabilities commonly affect students with blindness, visual impairments, learning disabilities or other physical conditions that make it difficult to hold or manipulate educational materials.

Many struggling special needs students in all thirteen eligibility categories may have print disabilities. Teachers may meet students' needs by translating the principles of Universal Design for Learning (UDL) into practice. However, there is a high level of need for learning, understanding and identifying the broader scope of print disabilities within the IDEA processes. Students with print disabilities and print disability related needs, are often not provided accommodations and modifications within the student's individual education plan (IEP) to a level that meets the legal standards set forth by the Supreme Court. This is due in part to a lack of understanding of all the IDEA disability areas that may include print disabilities. This Guide seeks to assist in providing further education.

The most recent Supreme Court interpretation of the FAPE standard (free appropriate public education), *Endrew F.*, should be reviewed and considered by IEP teams regarding the progress standard for students with print disabilities. The most recent Wisconsin case that applied *Endrew F.* is the *Grafton SD* case. It has a relevant quote which addresses the concerns about the proficiency standards for students with print disabilities:

> *Under Endrew F., the IDEA requires a school district to offer an IEP that is reasonably calculated to enable a child to make progress appropriate in light of the child's unique circumstances and that a child should have the chance to meet challenging objectives. The law also requires the LEA to reconvene*

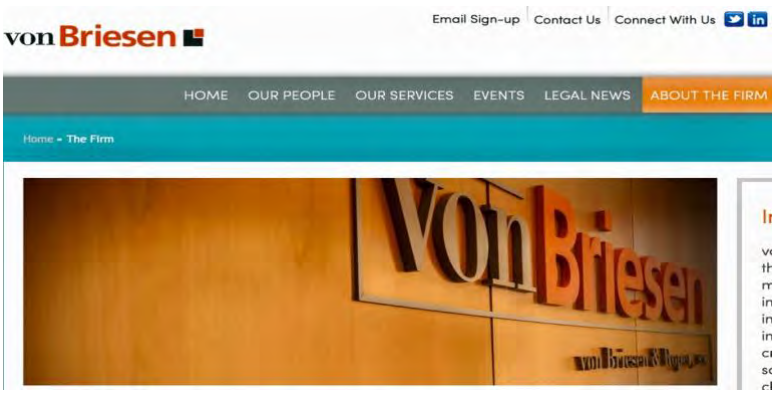
> *an IEP to make an offer of service, even if parents decline the opportunity to attend the IEP meeting. Sustained periods of time where a student makes little (de minimis) progress and the goals remain static provide evidence that the IEP was not reasonably calculated to enable the student to make progress appropriate in light of his [the student's] unique circumstances.*

This is key language for the FAPE standard and the school district's obligation to students with disabilities under the IDEA. It is applicable to the situations where print disabilities are unidentified, or the student is making little to no progress. FAPE is also reviewed in light of least restrictive environment. In cases where students struggle, but are not otherwise identified with print disability issues, IEP teams, educators and parents should consider whether disability related needs could be addressed through the many print accommodations, such as speech-to-text or text-to-speech, or modified and/or improved teaching methods. The current State English Language Arts (ELA) and Literacy Common Core State Standards proficiency scores for students with disabilities should trouble all of us and are a call for action. There may be a number of factors at play, but certainly print disability related needs and issues should be considered in all IEP meetings.

Although many IEP teams do not consider the broad scope of potential print disabilities, the IDEA requires that student evaluations cover all areas of suspected disability, use a variety of assessment tools and strategies and obtain information to assist the IEP team in developing an IEP that meets the *Endrew F.* standard. Key considerations are the student's functional ability to use and learn from standard print materials such as: 1) seeing text on a page; 2) holding and turning pages of a print book; 3) reading for required lengths of time without fatigue; 4) the ability to decode letters, words, and read with fluency; and 4) whether the student is writing at grade level or is at least commensurate with the abilities that the student's intelligence should reflect when using standard print materials. In terms of the IEP itself, the IEP team should look for opportunities to document the need for print accommodations and modifications through the present level of academic and functional performance, documentation of disability related needs, supplementary aides and related services, and through special factors.

Videos of Attorneys Discussing the WCASS Guide

This section includes reactions from parent and school attorneys, responding to the exact same questions regarding the WCASS Guide publication and school districts' obligations to provide students with disabilities access to their grade level curriculum.



Christine V. Hamiel,

Attorney, Von Briesen & Roper

Link to Christine Hamiel, Attorney for Schools video interview

Patricia N. Engle, Attorney

Schott, Bublitz & Engel S.C.

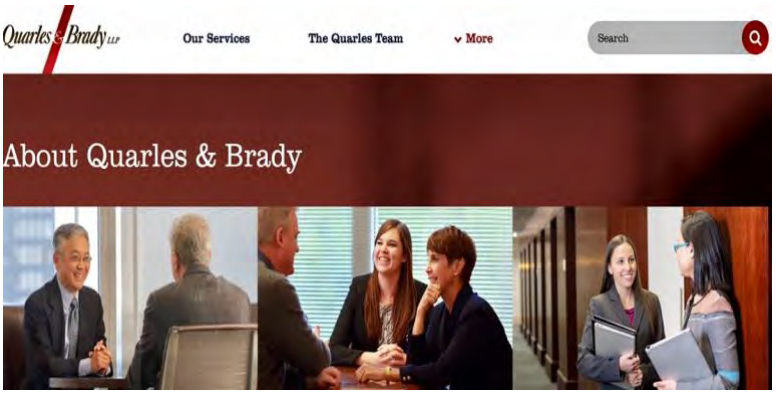
Link to Patricia Engle, Attorney for Parents video interview

Monica Murphy,
Managing Attorney
Disability Rights Wisconsin

Link to Monica Murphy, Attorney for Parents video interview

Renae Aldana,
Mediator at WSEMS

Link to Renae Aldana, Mediator at WSEMS video interview



Alana M. Leffler

Gary Ruesch

Link to Alana Leffler and Gary Ruesch, Attorneys for Schools video interview

Because of User Statistics from National AMPs

- As documented on the DPI WISEdash portal, SwD are not proficient in Reading, ELA, Math or Science. This means that SwD are unable to access, be involved and make progress in the regular education curriculum.

- Wisconsin has about 120,000 SwD.

- Only about 5% (N=6,500) SwD were registered with Learning Ally. Of those 6,500, only 2.7% (N-181) SwD use Audiobooks frequently*.

- Only about 13% (N=15,600) SwD were registered with Bookshare as of February 4, 2021. While Bookshare does not report how frequently Text To Speech materials are used by these students, it does report that only about 18% of these students received Bookshare materials during the 2019-2020 school year.

- Based on the information from Bookshare and Learning Ally, the majority of Wisconsin SwD are not afforded IDEA 2004's own 'remedy', namely Accessible Educational Materials (AEM), in order to access the general education curriculum. Furthermore, those few who are afforded AEM, do not use it often, or do not use it at all.

*Learning Ally defines "Frequently": based on extensive review of Learning Ally reading data, **33 days of reading for 20 minutes per day** is a reliable indicator that students are developing the habit of reading and are ready to skyrocket into even higher levels of reading achievement. It's also a sign that educators are implementing the Learning Ally Audiobook Solution with fidelity.

Because of Experiences of a 13-Year-Old Boy

When schools do not meet the educational and/or access needs of a learner, their mental health may be impacted, creating learning an even greater challenge.

What if this child had access to print from early on?

A 13-year-old boy, who has a significant print disability, in his words:
"I remember when I was in kindergarten. It was fairly easy, 'cause I didn't have to do very much work. I remember the letter marriages c-h, s-h, and the others – it was hard to remember what the teacher was teaching and didn't seem to always make sense and it didn't feel good. I didn't think too much about it, because I was in kindergarten, and I focused on the other 2 kids who were struggling like me, so it didn't seem too bad.

Then first grade happened. I started noticing that I was different than everyone else when all the book stuff started happening. Everyone else was at levels c and d, e, f, g and I was still at a. This did not feel good, and I started to think that maybe something was wrong with me, but I still didn't understand why everyone else was higher than me, and I really wanted to read those other books and be at a level past a.

Second grade was the year that I realized I was really different and felt it even more. I remember when we would have projects of reading a book then tell the teacher what happened. I remember flipping through pages and telling the story from the pictures and not the words. The words moved around for me, and just didn't make sense. I knew I was good at some things, like building Legos, but my reading and writing were terrible. In the classroom it felt like I was trapped – like no matter how I tried, I couldn't get it right. It felt terrible, it felt like my stomach was being eaten from the inside out, like I was dropped from a 10-story building and survived and had to just keep on going. I would miss recess a lot because my work wasn't done.

Third grade was no better, maybe even worse. The difference was a new teacher, Mrs. M. She was a wonderful teacher, she understood my frustrations and helped me to cope with it by telling me to slow down, learning to take a breath and taking breaks, she was nice and very encouraging. She tried to make sure I got recess too. Other teachers always seemed to get frustrated with me, and would tell me to, "pay attention, try again, try harder, you can do this". I didn't understand any of the books anymore, in reading, science, social studies – it felt like I was dumb. I had to open the book and stare at the words, and none of it made any sense to me. I started to hate going to school and I remember my mother practically dragging me to the bus. By the end of elementary school, it reached a point where I wouldn't even get on the bus anymore, my mom had to drive me to school – getting out of the car was a whole other story. Going to school felt like I was suffocating, an arrow to my lungs and I couldn't breathe. I didn't understand why the other kids could open those books and read and I had no idea what those letters meant. I didn't think I could learn, I felt stupid and hated even the idea of school, I was embarrassed. Going to sleep was hard too, because all I could think about was what the next day was going to be like at school and how would I survive.

By the time I hit middle school, some things only got worse. Even though I had access to a break room, and was learning how to use technology, it wasn't enough to change how I felt about school, or to learn like everyone else. It felt like others thought of me as the kid who couldn't read, the dumb kid, the weirdo. Do you know what it feels like to be in 7th grade and be the only kid who needs a book read to you by an adult? It feels terrible. It feels like everyone is judging you.

Click on the image above: The 'Seeing AI' app narrates the environment in front of you

Or to be walking down the hall, feeling good about using an app **(called Seeing AI**) to read a poster on the wall, and to have an adult tell you to put the phone away? It sucked. It was bad enough that teachers said this, even worse when kids would say it. I didn't believe I could learn, I thought that something was wrong with me, it was all my fault that I couldn't read or learn. I felt dumb and like I didn't belong. It was getting harder and harder to get out of bed, and a lot of fun stuff wasn't fun anymore.

It took a very long while for me to believe I am smart, and I can learn. I'm not dumb – even though that's how I feel when I'm at school.

I'm still learning to read, and it is hard. I am grateful I have such a great teacher for reading and math, he helps me more than he will ever know, he really gets me. I'm also still learning to use my technology to learn, to ear read (Text To Speech) for subjects like science and history, it's different than ear reading a book just for fun, I've been doing that for a long time. I use **audio books like Audible** when I just want to listen to a good book and I use things like **Learning Ally**, and **Bookshare** with **VoiceDream** for schoolwork. I use the **built-in accessibility** features on my **Macbook Pro** and **iPad** too, or **Read and Write** for Google, it depends on what I'm doing. It's not as easy as it sounds, like I said, I'm still learning, even things like when to stop the reading to figure out if I need to take a note or to highlight something, I'm still getting familiar with these things. I use my **phone** too, for **listening to books** and to communicate with others, especially **voice to text** to let me text. Thank goodness I have an amazing technology coach to help me with all of this.

I am smart. I can learn, I just need to keep reminding myself."

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Because of Experiences of a Mother & Advocate

Authored by Toni Chambers

The melding of hats…parent, advocate, educator

I am the parent of a child with a significant print disability. I am employed by Wisconsin Family Ties, a parent-run, nonprofit organization, working with families that include children with social, emotional, behavioral, or mental health challenges. We walk beside families to provide emotional support while helping to navigate the complex service and treatment systems with which they are involved. I also have a teaching background in special education and post-secondary education. Combined, these lived experiences have formed my perspective and commitment when it comes to providing access to print for learners with a print disability.

Toni Chambers,
Mother & Advocate

I'm taking a risk, in sharing with you, a part of my son's journey. We knew there were challenges as early as kindergarten. Our son couldn't rhyme, struggled with learning the names and the sounds of letters, and he had little to no success with 'high-frequency words'. When we addressed our concerns with the kindergarten teacher, we were told to give him time. She told us that it was his behavior getting in the way of his learning.

A few more months into kindergarten, we noticed anxiety, and challenges with separation from us, things we had not observed in the past. Yet, our son remained curious and inquisitive about most things. Our son had an IEP; the focus was on his behavior. Questions and concerns regarding his lack of reading skill development were dismissed. We were told to "practice more with him." Again, we were told to give him time.

During his first-grade year, our son had a wonderful relationship with his first-grade teacher, and the behaviors basically vanished. However, by the end of first grade, we were told he was at a 'level D' (Fountas &Pinnell) in reading, which is considered kindergarten level. Again, we were told to give him time.

During second grade, as parents, we saw the struggle to read increase. We also saw an increase in our son's anxiety and a diminishing of his curiosity and excitement for school. During this time, in addition to his classroom reading instruction, our son was pulled into the special education room for more reading instruction as his classmates learned in the areas of science and social studies. Despite the intervention through his elementary years, the reading gap grew bigger, his access to content areas such as science and social studies became less, and the curiosity and joy of learning continued to fade. Sadly, this is also the time our relationship with the school became strained, as our concerns "made the teacher uncomfortable," as we tried to address possibilities such as technology and to better understand our son's lack of progress in reading.

As a parent with a teaching background, it was crushing to not have the ability to teach my child to read. My son required a specific skill set; a specific approach to learn to read, and I did not possess it, nor did those around him at school. He left elementary school with reading and writing skills at about the 1st-grade level, and major gaps in content areas such as science and social studies. Despite this, formal testing indicated an expressive vocabulary measuring in the 'superior' range and verbal comprehension above average.

Despite renewed enthusiasm for middle school, the gaps that existed for our son were too great for him to overcome. He did not have full access to print for the content areas. The technology provided to him didn't always meet the needs for middle school learning, and glitches prevailed. His feelings of worth and ability spiraled downward, and his mental health was impacted. As parents, it was more than difficult to hear our son talk about his lack of self-worth because he couldn't read, because he couldn't learn like everyone else.

When we as parents, with the support of a parent advocate, developed a collaborative approach with the new IEP team, with all embracing the questions and exploring the possibilities, we began to feel hope. We were able to build a plan within the IEP process that worked for our son, and we saw our son begin to grow in confidence and in reading ability. He still has a long way to go, and although his print materials are now accessible, he is not fully ready for them yet. There is a learning curve for him when it comes to accessing and learning with them – he does not yet recognize how smart he is, and that it's not "cheating" to have materials in an auditory format. He is still learning that using technology is an acceptable way to learn, and moving beyond the feeling that learning is hard, as he had experienced throughout his elementary years. I can't help but wonder if early on, as young as first grade, when the other children were beginning to navigate print other than their reading books, what would have happened if our son had access to those materials as well, if he had text to speech. At the time, he was so very curious and excited about learning, where might his learning be today?

In my role with Wisconsin Family Ties, I have supported numerous families and youth across grade levels. What strikes me at the middle and high school levels, is the number of these students who exhibit 'behaviors,' poor attendance, and frustration with school. Often, upon closer examination, we find learners who struggle with print. For several of them, when we've been able to remove the barrier and provide them with text to speech, outcomes improved. Unfortunately, for many, they have reached a point where they don't believe in their own abilities because they have struggled so very long, feeling something is wrong with them, feeling embarrassed by what they can't do. Parents are often exhausted by this point as well, not understanding the challenges or possibilities, when a child has a print disability.

I don't want to imply that text to speech is a panacea or a 'cure-all' for the struggles many of our learners have. I do believe, however, that it is an additional, potentially powerful way to meet a need for learners with print disabilities. I strongly believe that we need to continue to teach our children to read, even if this takes time beyond the traditional third-grade year, and into secondary years if needed. At the same time, we must provide them

with access to the print they need to advance their learning, just as learners without print disabilities do. This means access to texts, access to websites, access to teacher-made materials, access to flyers and handouts, and the countless other ways print shows up across school environments. From the classroom to the lunchroom to extra-curricular activities, print is everywhere, and our learners need access.

This isn't an 'either/or' situation, but rather, an 'and': Learning to read, AND learning with the use of technology, to access curricula. We need to make it ok, to 'normalize' text to speech for learners who need it. We need to engage families in the discussion from early on. We need to collaborate, ask questions, and explore the possibilities that technology for text to speech has to offer. When we let the gap grow, we create additional challenges and barriers, not only to learning but to the whole child, and often, the family.

Providing access is far easier than restoring mental health!

Because Access Matters

The Interview: A Parent and a Former Student, Share Perspective on the Impact of Text To Speech for individuals with Dyslexia.

Authored by Lourcicia Carson

Loucricia Carson, Program Support Teacher Assistive Technology

Access, as defined in Merriam-Webster's Online Dictionary, is described as liberty, permission and the ability to enter. When processing this definition through the lens of an educator, who considers herself to be a student of assistive technology, I visualize access as a key that opens a door, empowering students with tools to succeed. In joining the collective effort of empowerment, the purpose of this section is to discuss the significance of providing access to the curriculum by utilizing Text To Speech. This message of impact will be delivered by outlining an interview with 2 unacquainted individuals that shared a common story and concluding with why it matters. As a volunteer board member of the Wisconsin State Branch International Dyslexia Association and chair of the Conference/Education Committee at the time, I participated in the 2020 panel discussion for Knocking down Barriers to Dyslexia. My role on the panel was to share my perspective on how various assistive technologies can be used to provide access to grade level content for students with Dyslexia.

The products that I shared all had common functions, with Text To Speech being one of the main features of support. Following that discussion, one of the parents on the panel reached out for assistance. There are two people that joined me as I asked questions regarding overcoming challenges with Dyslexia. Katie Kasubaski is a Dyslexia Practitioner and State Lead for Decoding Dyslexia Wisconsin. With two of her children having Dyslexia, one case being more severe than the other, Katie has great insight on

the struggles parents may go through to support their children. Her deep passion for helping families overcome learning barriers associated with Dyslexia as she advocates for their needs to be met, is simply heartwarming. Andrew is a young man who recently completed graduate school. I asked him to share his story as well after hearing him talk about tools that helped him accomplish postsecondary studies.

The goal of this interview was to capture lived experiences while highlighting successful moments that encourage families and educators across the state to help maximize access and achievement for every student that struggles to read grade-level content. During the interview, Katie begins sharing her perspective on their children's learning challenges. She emphasizes that there's a difference in severity between her two children that have Dyslexia. Because her son (younger) received tutoring at an earlier age, his Dyslexia was less severe. Their daughter, on the other hand, required more support, as she was apprehensive when seeing print/text. Though she had a large vocabulary and desire to learn, the traditional school approach was not sufficient to provide access to grade-level content for this middle school student. Diligently looking for solutions and ways to support her child, Katie learned about assistive technologies such as text to speech. Text to speech helps to meet the need, greatly improving her daughter's ability to independently access text as she participates in class. Can you imagine how it must feel, being filled with the desire to engage yet the barrier standing in the way is the lack of access to the very text that the assignments or activities are based on.

When you watch the interview, Katie shares how her daughter currently overcomes learning barriers and the door that is now open for her. As the interview proceeds, Andrew describes the challenges he encountered in school and how he responded to using technology throughout K-12 education. Andrew began using technology to assist him in school when the functionality was quite a bit different and took longer to operate. Andrew elaborates on his journey to accepting and navigating the use of technology as it became instrumental for him. As Andrew shares perspective, he talks about how it may look for a college student with Dyslexia to make it through school. When Katie and Andrew engage in discussion, at one point they both refer to this being a great time to have

Dyslexia. Watch the full interview to get the whole story to reveal the meaning behind their statement.

Parent and Student Interview

Why Access Matters

For over 20 years, my experiences involved assisting families and collaborations among stakeholders across the state of Wisconsin as well as various areas of the country all with one common goal in mind. Increasing reading achievement and access for all students, especially those with special needs has been a strong focus and the foundation of my professional development plan since the beginning of my career path in the field of education. Whether there's a child struggling to engage in classroom activities or at home figuring out how to express what they've learned while completing a homework assignment, access matters.

For a high school student considering the possibility of applying to college and a young adult, developing a resume in pursuit of employment, access matters. The relevance of this subject has roots in the united effort to increase statewide reading achievement and overall access for students. In reference to IDEA's federal mandate to provide access for children with disabilities and a decrease in the 2019 national reading score as reported by the National Assessment of Educational Progress, it is essential to interrupt the pattern of failure. When analyzing the data from the NAEP report, the state of Mississippi was the one state that showed an increase in their reading score. It was around the same time that I was engaged in discussions about supporting children with Dyslexia and began a diligent pursuit to find out more information about their educational progress and increase in reading achievement.

My pursuit for the answer was fulfilled when I discovered Representative Byrd's endeavors to improve reading achievement in the State of Mississippi through Dyslexia legislation. The legislative changes lead to early screenings for young students and funding that follows the student allowing them to get the reading support they needed to

increase their achievement. Intrigued by his personal experiences as he was diagnosed with Dyslexia late in his senior years, overcoming barriers, and advocating for all children that struggle to read, I became even more connected with the effort to help provide access.

Without consistent access to the curriculum, students are left without the keys to open the doors to their education and future success. When speaking with one group about resources in our state, that can support students with Dyslexia, such as the Wisconsin AEM Center and Assistive Technology Community of Practice, I mentioned a hungry person that has low blood sugar sitting in a kitchen with a locked refrigerator full of food. How would that person get the help and nutrients necessary to survive/thrive without knowing what's available and having the key to obtain it? It will take all stakeholders in Wisconsin to advocate for consistent use and efficient progress monitoring of assistive technologies such as Text To Speech (and various accompanying tools, like writing aids and visual timers) to maximize access and achievement for our students in the area of reading.

Because Students with Dyslexia Need Access to Grade Level Content

Authored by Katie Kasubaski, Decoding Dyslexia, WI State Lead,
and Kari Baumann Decoding Dyslexia WI State Co-Lead

Decoding Dyslexia Wisconsin (DDWI) is one of 50 state chapters of Decoding Dyslexia across the United States along with other international chapters. DDWI is a parent-led grassroots group advocating for individuals with dyslexia and their families.

Katie and her children

Kari and her son

We offer encouragement and understanding to families of struggling readers and those with dyslexia. Our community outreach has included local support meetings, statewide online events along with resources on our website: https://www.decodingdyslexiawi.org/. Often, individuals who have dyslexia in their families feel isolated and uncertain where to turn for resources and support including how to access grade level content. Nearly 80% of students with specific learning disability (SLD) struggle in reading[2]. **The creation of the *WCASS Guide* to access grade level curriculum is a valuable resource for our community.**

We have a similar story in that we both knew our oldest children were struggling to read as early as before kindergarten. Testifying at the Wisconsin capitol for the dyslexia guidebook is what brought us together. At the time of the hearings in 2019, both of our

[2] Rennie Center for Education Research and Policy, Seeking Effective Policies and Practices for Students with Special Needs (Cambridge, MA: Spring 2009).

children were in elementary school and still struggling with literacy. The emotional toll that struggling to read can take on the students, parents and teachers was clear to us on those hearing days. We were all reliving trauma as we told our stories to the legislators. Kari's son had anxiety and depression from the stress he had to go through in the public school system daily. She even pulled her son from the school district and traveled 4 hours to a neighboring state weekly for 18 weeks. Her family paid thousands of dollars out of pocket to help her son grow just enough in reading to build back his confidence and want to keep fighting and learning. Katie's daughter also experienced print anxiety due to her severe dyslexia. Her daughter has excellent comprehension and understanding but very weak decoding skills. These stories are not uncommon among DDWI families.

Dyslexia advocates in WI have worked for years to bring more awareness, resources and assistance to students with dyslexia. Hours of testimony from parents across Wisconsin, along with the work of former Representative Bob Kulp and Senator Kathy Bernier, helped pass the first dyslexia legislation in Wisconsin which was signed by Governor Evers in February 2020. The Informational Guidebook for Dyslexia and Related Conditions is just part of what families of struggling readers and those with dyslexia need for support.

Struggles with decoding skills often leads to the question of how students with dyslexia can still access grade level content. Dyslexia is an unexpected difficulty in reading in relation to other cognitive abilities. Students with dyslexia need appropriate literacy instruction while at the same time having access to all the same grade level content as their classmates. Both our families have used various assistive technology devices as well as book subscriptions including Google Read and Write, Bookshare, Learning Ally

and Audible. Katie's daughter called the features in Google Read and Write a "game changer" allowing her to fully participate in learning with her classmates. **As parents, we have needed to seek out these resources and then find ways to train our children how to use them. We are excited to see the creation of this *WCASS Guide* publication designed to help schools and parents provide access to grade level content for all students.**

Because of the Relationship between Academic Success and SEL

Authored by Jessica Nichols

Jessica Nichols, Statewide Coordinator, promoting healthy social and emotional development for young children

Tending to the social and emotional development of all learners is a critical aspect of providing equitable education. Social and Emotional Learning (SEL) is defined by the Collaborative for Academic, Social, and Emotional Learning (CASEL) as the process through which children and adults acquire and effectively apply the knowledge, attitudes and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions (https://casel.org/what-is-sel/). Social and emotional skills enable learners to understand and manage their feelings, engage in healthy relationships, and navigate social environments. Ultimately, social and emotional learning is essential in order to ensure readiness for college, career, and the community.

IEP teams can ensure each and every student has access to the general education curriculum and environment, including opportunities for rich social and emotional engagement, by providing Text To Speech services and other supports across all settings. By allowing all learners, regardless of reading ability, the opportunity to meaningfully participate in the general education curriculum with same-age peers, we are setting students up for success both during school years and beyond.

Text To Speech is a service that benefits not only academic progress for students with a print disability, but their social and emotional development as well. A large body of research substantiates that the relationship between students' academic achievement

and functional performance, which includes social and emotional skills, is inter-connected. For many students to be successful in academic programs, both their academic and functional needs may require support.

Consider a fourth grade learner with a print disability who reads with fluency at a first grade level. The student struggles to access the curriculum through print, and therefore is unable to engage with the academic content. The learner may then become frustrated, doubt their sense of self-worth, and wonder why they differ from their peers. This fourth grader is then asked to engage in a project with peers. Consider how those feelings of self-doubt may grow, leading to withdrawal from participation with peers, and thus losing an opportunity to practice and develop critical SEL skills such as relationship building, self-awareness and social-awareness.

Jessica Nichols, Early Childhood Statewide Coordinator for Equitable Multi-Level Systems of Supports, has served Wisconsin children and families for over 15 years. Jess contributed to the development of Wisconsin's Social and Emotional Learning Competencies and advocates for the social and emotional needs of students with IEPs.

IDEA 2004: the Legal Basis for NIMAS and NIMAC

Creation of NIMAC (National Instructional Media Accessibility Center).

As part of the 2004 re-authorization of IDEA, Congress included several provisions designed to improve the quality and delivery of educational materials in accessible formats to ensure that Students with Disabilities have access to, are involved in, and make progress in the general education curriculum. In particular, IDEA 2004 established the National Instructional Materials Accessibility Standard **(NIMAS)**, a technical standard to be used in the conversion of print instructional materials into accessible formats [i.e., braille, audio, digital text (Text To Speech), large print]. The National Instructional Materials Access Center (NIMAC), was established as a national repository for NIMAS source files.

The NIMAC receives digital source files from publishers and makes these files available to states for use in producing the accessible formats needed by students. NIMAC does not produce or distribute any materials for use directly in schools. NIMAC is a "behind the scenes" resource that states use through their designated accessible media producers (such as Bookshare and the American Printing House (APH) to produce braille, digital text large print and audio files.

NIMAC accounts are only available to:

1. Authorized Users (AU). The Wisconsin Accessible Educational Materials center (WI AEM Center) is an Authorized User that coordinates with NIMAC to assist districts in securing timely access to accessible formats of printed textbooks and core instructional materials for students with print disabilities.

CESA 2 Submit A Request form

Once you click on the above link, choose the 'WI AEM Center Request Form'. The form is pretty self-explanatory but it asks for the following: grade level of the student, disability category of the student for whom materials are being requested, name of the requestor, student name, item requested (including title and ISBN for requested item), district name, school name, email address, and phone number. There is a place for attachments if necessary (i.e., a photo of the resources/books being requested). There is also a box where districts can leave questions or concerns

2. The AU for Blind and Visual Impairment in Wisconsin is the Wisconsin Center for the Blind and Visually Impaired (WCBVI) Outreach Department wcbvi.outreach@wcbvi.k12.wi.us
3. Accessible Media Producers (AMPs), like Bookshare or Learning Ally (most suitable AMPs for Text-to-Speech files or Audiobooks.
4. Publishers of educational materials

Teachers or individual schools do not interact in any way with the NIMAC to obtain the materials they need for their students. They will go through the organizations or agencies their state has designated to produce and distribute the accessible formats needed by students. Wisconsin designated Bookshare as the Authorized User of the NIMAC.

1. The first step for Wisconsin teachers looking for Text to Speech / audiobooks for students who have been identified by the IEP team as having a Print Disability and being need of AEM, is to use the NIMAC's search engine, Louis Plus to find out if a particular book is already available. Louis Plus is a national database that contains information about accessible materials available from Bookshare and many other agencies and organizations, including files available from the NIMAC. To avoid duplication of effort, it is suggested that users search Louis Plus first, to see if the format they need may already be available.

2. In Wisconsin, Bookshare serves as both an AU and an AMP of the NIMAC. That means that educators can contact Bookshare directly to request books from the

NIMAC and add them to our collection, for the benefit of their students. See the two links below:

https://www.bookshare.org/cms/help-center/how-does-school-state-which-bookshare-authorized-user-request-nimac-book-0

and

https://www.bookshare.org/cms/help-center/access-nimac-books

The benefit of this for WI educators is they don't have to go through a state agency such as WCBVI first if they need a book from the NIMAC; they can go straight to Bookshare. But of course, they can still go through the Wisconsin AEM Center or WCBVI if that is preferred. In that case, Bookshare functions as the AMP rather than the AU.

3. The Learning Ally Audiobook Solution has an advanced process for generating text files directly from publishers and therefore does not use the NIMAC.
    - This process allows for extreme efficiency in the production of high-quality human-read audiobooks.
    - NIMAC files tend to be limited to curricular content (i.e., textbooks), and Learning Ally's library includes textbooks, novels, and literature that includes what students need to read and want to read (i.e., popular titles)
    - Since NIMAC files are limited to students with IEP's, Learning Ally's Eligibility Guidelines allow for broader access to eligible students.
    - To search for a book in the Learning Ally Audiobook library, visit Learning Ally and search for the title.

4. If a book is available through Bookshare or Learning Ally, the two major AMPs for Text To Speech or audiobooks, the searching teacher should then contact

Bookshare or Learning Ally directly to obtain the book in the desired Accessible Format of choice (either Digital Text, Audio, Large Fonts or Braille).

5. If a book is available on NIMAC, but not on Bookshare or Learning Ally, or not available on any of the above three, teachers should contact The Wisconsin Accessible Educational Materials Center (WI AEM Center) to obtain these materials through other publishers.

How Does a Student with a Disability Qualify for NIMAC Materials?

As previously noted, Congress created NIMAC to be a national repository of files that includes accessible materials. However, to qualify for these materials, the eligibility criteria is:

An individual who, regardless of any other disability –

(A) is blind

(B) has a visual impairment or perceptual or reading disability that cannot be improved to give visual function substantially equivalent to that of a person who has no such impairment or disability and so is unable to read printed works to substantially the same degree as a person without an impairment or disability, or

(C) is otherwise unable through physical disability, to hold or manipulate a book or to focus or move the eyes to the extent that would be normally acceptable for reading.

- Each of the above categories must be certified by a "competent authority" as meeting the eligibility criteria.

- For the first three categories, the "competent authority" includes school and district personnel such as teachers of the visually impaired, special education teachers, school psychologists and medical professionals. Up until recently, the only "competent authority" who could certify a reading disability was a medical doctor.

However, with the changes in the 2019 U.S. copyrights laws, the National Library Service (NLS) released its definition of who is that 'Competent Authority":

Professional staff of hospitals, institutions, and public or private welfare agencies, such as an educator, social worker, case worker, counselor, rehabilitation teacher, certified reading specialist, school psychologist, superintendent, or librarian.

Bookshare, a major Accessible Media Producer (AMP) that provides schools with NIMAS materials (including Text To Speech) relies on IEP team members like special education teachers and / or school psychologists to function as the 'competent authority', among others, to certify that the student has a reading disability or print disability (these labels may be used interchangeably).

Credit: Don Johnston Incorporated

Once the student is certified by members of the IEP team as having a reading disability or print disability, the school district would then contact an AMP such as Bookshare to obtain materials developed from NIMAS source files including Text To Speech, if so determined necessary by the IEP team.

Here's what the NIMAC website currently says about who is eligible to receive materials:

Who is eligible to receive formats produced from NIMAS file sets?

What if a Student Does Not Qualify for NIMAC Materials?

- What if a student experiences reading deficits, but does not qualify the student in any of the categories noted earlier?
- Regardless of the non-qualification, the IEP team can still determine that the student needs Accessible Educational Materials (AEM) in order to receive a free appropriate public education (FAPE).
- Obtaining AEM through NIMAC for students who don't meet one of the four eligibility categories is not an option. Instead, the school district must obtain these materials directly from an AMP who does not work with NIMAC, like Learning Ally, or contact publishers directly in a timely manner.

What is a Print Disability?

According to the Maine Center for Accessible Instructional Materials[3], a print disability is not a new disability classification, but actually refers to disabilities such as blindness, low vision, learning disabilities, or physical disabilities, or the general inability to access the printed page for a wide range of reasons.

Clearly, in a typical classroom where teachers rely heavily upon printed materials as the main tool for teaching, it is a challenge for students with a print disability to access the classroom materials.

A print disability is easiest to understand when considering how the student interacts with printed materials. A student with a print disability is one who is unable to gain information from printed materials at an anticipated level for their grade, and thus needs Accessible Educational Materials (AEM) in an accessible format (i.e., braille, large print, audio or digital text/Text To Speech) in order to access that information.

David Rose, chief scientist at Center for Applied Special Technology (CAST), describes in this video how the medium itself, the printed page can become a barrier, an actual disability for some students. In fact, Rose asserts that the print disability is not located in the child, but rather resides in the interaction between the child and his/her learning environment.

Click on the image above: Dr. David Rose, Chief Scientist, CAST

[3] https://maine-aim.org/what-is-a-print-disability

The term “Print Disability” emphasizes the role of the learning environment, the printed page in creating the disability.

Click on the above image for the video.

Please see sections that follow for indicators of Print Disability.

What Should IEP Teams Consider as Indicators of Print Disability?

Indicators of Print Disability According to the Wisconsin AEM Center[4]:

A student with a print disability is one who cannot access print in the way most students do and therefore needs an alternative or specialized formats such as digital text, large print, audio, or braille. A person with Print disabilities is someone who, regardless of any other disability, (A) is blind, (B) has a visual impairment or perceptual or reading disability that cannot be improved to give visual function substantially equivalent to that of a person who has no such impairment or disability and so is unable to read printed works to substantially the same degree as a person without an impairment or disability, or (C) is otherwise unable, through physical disability, to hold or manipulated a book or to focus or move the eyes to the extent that would be normally acceptable for reading.

Consideration of the need for Accessible Educational Materials (including Text To Speech) is required for all students with disabilities, regardless of the nature of the student's disability. IEP teams determine which students require Accessible Educational Materials to use and learn from standard printed materials. Teams may assess the extent to which a student can:

- Decode or extract meaning from print materials at or near grade level
- Read for required lengths of time without tiring,
- Hold a book and turn pages
- See printed materials
- Read with fluency

Once IEP teams have determined the necessary formats, school districts can acquire AEM through direct purchases from publishers or non-profit Accessible Media Producers that operate in the U.S. under a copyright exemption which are able to make books available to individuals with print disabilities.

[4] https://www.cesa2.org/services/wi-aem-center.cfm

Indicators of Print Disability According to Bookshare:

As a Major Accessible Media Producer (AMP) affiliated with NIMAC, Bookshare describes Print Disability:

If a student finds it difficult to process or comprehend words, see text in books or on a screen, or physically manage books or reading devices, Bookshare may be able to help. For a student to join Bookshare, an expert, or Qualifying Professional, must confirm that the student has a qualifying condition that significantly interferes with his or her ability to read or process printed text. Following are some indicators that a student might have a qualifying condition:

Specific Learning Disability (SLD) that Affects Reading**:**

- A disorder in the basic psychological processes involved in understanding or in using written language, which manifests itself in the imperfect ability to read. Dyslexia is one example. Students in this category often have SLD on their Individualized Education Plans (IEPs) and/or have a diagnosed learning disability.
- Need for Reading Accommodations
    - The student struggles with reading and does not respond to instructional interventions to improve reading. Students in this category are sometimes served under Section 504 of the Rehabilitation Act of 1973.
- Blindness or Visual Impairment – Including low vision
- Physical Disability
    - A disability that hinders the student's ability to hold a book, turn pages, move his or her head, or otherwise physically manage the activity of reading a book.

Indicators of Print Disability According to Learning Ally:

Learning Ally uses the term “Reading Deficit” instead of “Print Disability”. A reading deficit as described by Learning Ally is determined by a student’s need for a reading accommodation due to an impairment in decoding, fluency and/or comprehension that does not allow a student to keep up with content at the same level as students without an impairment. An IEP or 504 is not required (this is why obtaining materials from NIMAC is not an option).

A reading deficit is determined by a student’s inability to keep up with content due to an impairment in at least one of the following areas:

- ✓ **decoding**
  - phonological awareness
  - phonemic awareness
  - orthographic awareness
  - oral language
- ✓ **fluency**
  - automaticity
  - fluency
  - processing speed
- ✓ **comprehension**
  - morphology
  - syntax
  - semantics
  - pragmatics
- ✓ **verbal reasoning**
  - verbal working memory
  - visual working memory
  - long term memory
  - attention
  - vocabulary

Where to Document in the IEP 'Print Disability', AEMs, and Text-to-Speech?

Wisconsin DPI Bulletin 20.02:

DPI Bulletin 20.02 notes that students who exhibit a "reading disability" qualify for NIMAS derived materials. The eligibility criteria is:

An individual who, regardless of any other disability –

(A) is **blind**

(B) has a **visual impairment or perceptual** or **reading disability** (emphasized) that cannot be improved to give visual function substantially equivalent to that of a person who has no such impairment or disability and so is unable to read printed works to substantially the same degree as a person without an impairment or disability, or

(C) is otherwise unable through **physical disability**, to hold or manipulate a book or to focus or move the eyes to the extent that would be normally acceptable for reading.

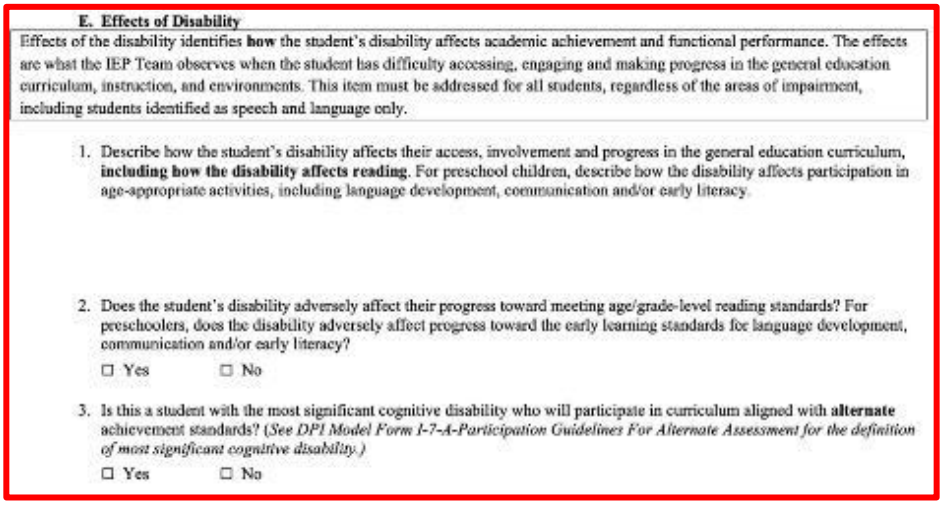
The previous 'Organic Dysfunction' label has been eliminated as a result of changes in U.S. copyrights laws on May 8, 2019

Educators / IEP team members have the authority to determine whether a student meets the eligibility criteria. The IEP team determines if a student is unable to read printed works to substantially the same degree as a person without an impairment.

In order for the IEP team to document in the IEP that the student has a reading disability (interchangeable with print disability, it has to go through a two-step process:

Step 1: the IEP team considers the question: "*Can the student learn and gain information from the same print-based and other instructional materials selected for use by all students*"? If the answer is "no", the IEP team can documenting the student has "difficulty with reading age or grade level text" in the "Effects of

Disability" section of the I-4 IEP Linking form. The IEP team should further document "why" the student is having difficulty accessing, engaging, or making progress in age or grade level reading curriculum in the "disability-related need" section of the IEP. Disability-related needs are the unique skills (e.g. fluency, decoding, comprehension) a student needs to improve so the student can access, engage, and make progress in age of grade level reading expectations.



E. Effects of Disability

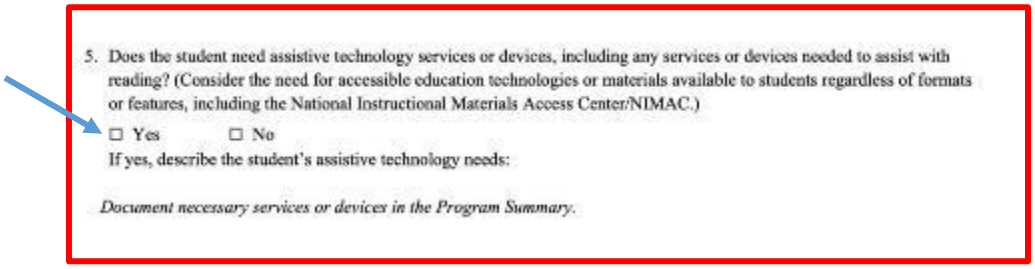
Effects of the disability identifies **how** the student's disability affects academic achievement and functional performance. The effects are what the IEP Team observes when the student has difficulty accessing, engaging and making progress in the general education curriculum, instruction, and environments. This item must be addressed for all students, regardless of the areas of impairment, including students identified as speech and language only.

1. Describe how the student's disability affects their access, involvement and progress in the general education curriculum, **including how the disability affects reading**. For preschool children, describe how the disability affects participation in age-appropriate activities, including language development, communication and/or early literacy.

2. Does the student's disability adversely affect their progress toward meeting age/grade-level reading standards? For preschoolers, does the disability adversely affect progress toward the early learning standards for language development, communication and/or early literacy?
   ☐ Yes ☐ No

3. Is this a student with the most significant cognitive disability who will participate in curriculum aligned with **alternate** achievement standards? (*See DPI Model Form I-7-A-Participation Guidelines For Alternate Assessment for the definition of most significant cognitive disability.)*
   ☐ Yes ☐ No

Step 2: After determining the existence of a "reading disability" in step 1, the IEP Team now moves on to determine what accessible format(s) the student needs**.** In addressing the IEP Linking form, I-4, item 5 of the Special Factors section, the IEP team considers: *"Does the student need assistive technology services or devices, including any services or devices needed to assist with reading? Consider the need for accessible education technologies or materials available to students regardless of formats or features, including NIMAS files from the National Instruction Materials Access Center (NIMAC)".*



5. Does the student need assistive technology services or devices, including any services or devices needed to assist with reading? (Consider the need for accessible education technologies or materials available to students regardless of formats or features, including the National Instructional Materials Access Center/NIMAC.)
   ☐ Yes ☐ No
   If yes, describe the student's assistive technology needs:

   Document necessary services or devices in the Program Summary.

In addition, in responding to the I-4 Linking form item "*Does the student's disability adversely affect their progress toward meeting age/grade level reading standards?",* describe how the student's disability affects their access, involvement and progress in the general education curriculum, including how the disability affects reading. For preschool children, describe how the disability affects participation in age-appropriate activities, including language development, communication and/or early literacy.

The Disability Related Needs (DRN) should answer the question: *why the student is not reading at grade level?* The IEP team will need to focus on the skills the student needs to improve in order to access grade level curriculum.

DPI Bulletin 20.02 also suggests the types of accessible formats the IEP team should consider, like how can the IEP team determine which digital features are best for the student, and how to obtain these materials in a timely manner? Please see below:

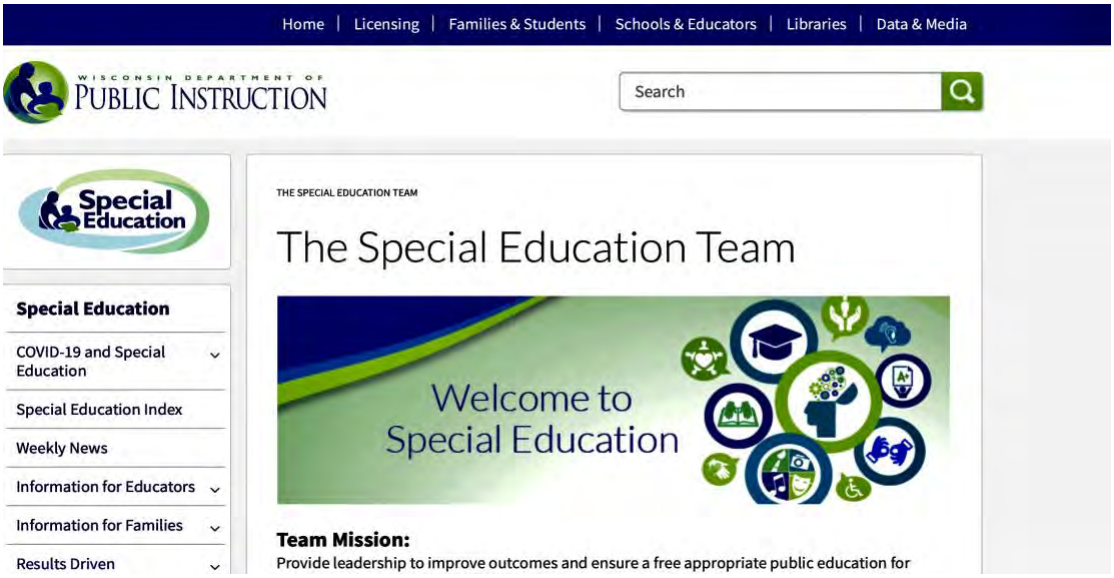
5. What types of accessible formats should the IEP team consider?

AEM may be provided in audio, braille, large print, digital text, or text-to-speech application. AEM are not limited to these formats. AEM include an alternative manner or form that gives an eligible person access to the work when the copy or phono record in the accessible format is used to permit him or her to have access as feasibly and comfortably as a person without such disability.

6. How can IEP teams determine which digital features are best for the student?

Many of the features that previously required the purchase and installation of specialized software are now often included as standard options on the devices many students already own. This makes the process of finding a good feature match for a student easier and less costly. Personalizing the Reading Experience provides guidance on how to activate built-in accessibility options (e.g., display options and text to speech) for customizing the reading experience. By experimenting with the various options, educators, students and families can work together to determine which digital features are best for the student.

Wisconsin DPI Message to IEP team members



In providing a free appropriate public education, each IEP team must consider whether a student with a disability requires assistive technology devices and services to enable the student to be involved in and make progress in the general education curriculum and in extracurricular and other nonacademic activities. Wis. Stats. §§115.787(3)(b)(5) and 115.787(2)(c)

Students with disabilities who need instructional materials in accessible formats must receive those instructional materials in a timely manner. LEAs must take all reasonable steps to provide instructional materials in accessible formats to students with disabilities who need those instructional materials at the same time as other students receive instructional materials. 34 CFR §300.172

Joy Zabala on AEMs and Technologies in the IEP

Once the IEP Team established that the student has a print disability and is in need of Accessible Educational Materials (AEM), the examples below suggest where and how to incorporate AEM in the IEP. These examples come from **Joy S. Zabala, EdD,** director of technical assistance at CAST and the National Center on Accessible Educational Materials. Dr. Zabala wrote in an article titled *Accessible Educational Materials and technologies in the IEP* that AEM such as Text To Speech may be included in any or all of these IEP components:

1. **Summary of Evaluation Results**
2. **Present Levels of Academic Achievement and Functional Performance**
3. **Special Factors**
4. **Measurable Annual Goals**
5. **Special Education and Related Services, Supplementary Aids and Services, Program Modifications, and Supports**
6. **Statewide Assessments**
7. **Postsecondary Goals and Transition Services**

Below are examples of IEP statements regarding the use of AEM in each of the above IEP components.

1. **Example of AEM IEP Statement for Summary of Evaluation Results:**
   "Sean is a seventh-grade student who has been previously identified as having a specific learning disability. According to the most recent evaluation data reviewed by the team, Sean understands grade-level content but is unable to independently derive

meaning from print-based materials. These data suggest that Sean may need a specialized format of printed materials and assistive technology. Further evaluation data indicate that to participate and progress in the general education curriculum, Sean will require a digital text format of printed materials and accessible technology-based materials that enable him to see and hear the content at the same time. This feature, called "text-to-speech," provides him with audio-supported reading".

2. **Example AEM IEP Statement for Present Levels**

   "Sean is a seventh-grade student who has a specific learning disability. He understands instructional content at grade level but is only able to read printed materials independently at the fourth-grade level. When using classroom computers and supported reading software with the text-to-speech feature, Sean successfully perceives and interacts with digital text formats of grade-level printed materials and other digital media materials across the content areas".

3. **Example AEM IEP Statement for Special Factors**

   "Sean understands educational content at grade level but is unable to read independently with sufficient accuracy and fluency to support comprehension at that level. Sean needs materials provided in a digital format to access the general curriculum. He will need a tablet and/or other computer with text-to-speech and word prediction capabilities to perceive and interact with digital text formats of grade-level printed materials".

4. **Example IEP Statement for Measurable Annual Goals**

   "By May 2018, when using a digital text format of the seventh-grade social studies textbook, Sean will identify examples of sequential, comparative, and causal presentations of information in text with 80% accuracy.

5. **Example IEP Statement for Special Education and Related Services, Supplementary Aids and Services, Program Modifications, and Supports**

   - "Sean will use a tablet computer that provides simultaneous visual and auditory

output to support perception of and interaction with digital text formats of grade-level printed materials and technology-based materials across content areas.

- Sean will receive training in how to use the digital text format and technology for participation and achievement.
- Sean's teachers and parents will receive training to support his use of the materials and technology.
- Sean will require headphones and preferential seating in a quiet area of the classroom when he is reading with text-to-speech".

6. Example IEP Statement for Participation in Statewide Assessments

"Consistent with the accommodations that Sean is using in the classroom, he will receive the following accommodations on statewide assessments:

- Read-aloud: Simultaneous visual and auditory access to text through the independent use of text-to-speech for all allowable parts of the assessment
- Scribe: Text input through independent use of word prediction software for all allowable parts of the assessment".

***Note of caution to Wisconsin teachers:** The Forward Exam does not include the Text To Speech tool in its Accommodation section. Instead, the Forward Exam includes it in its 'Designated Support' section. Thus, In order for the student to qualify to use Text To Speech during the Forward Exam, teachers need to include the following statement in the IEP "Text To Speech is part of the student classroom instruction".

7. Example IEP Statement for Transition Planning Goals

- Sean will learn to advocate on his own behalf in determining:
  - When he needs to use a specific specialized format and what technology works best for him in different contexts with different materials.
  - Sean will build the self-determination skills needed to advocate for his specialized formats needs in postsecondary environments by leading discussions during IEP development.

What is Text-to-Speech (TTS)?

The National Center of Accessible Educational Materials (AEM)[5] defines Text To Speech (TTS) as an artificial production of human speech, using special software and/or hardware which reads digital text aloud. TTS can be helpful for a number of readers: those who struggle with decoding, a key skill for learning to read.

The 'Understood' website[6] describes TTS as a type of assistive technology that reads digital text aloud. It's sometimes called "read aloud" technology. With a click of a button or the touch of a finger, TTS can take words on a computer or other digital device and convert them into audio. TTS is very helpful for kids who struggle with reading. But it can also help kids with writing and editing, and even focusing.

How TTS works. TTS works with nearly every personal digital device, including computers, smartphones and tablets. All kinds of text files can be read aloud, including Word and Pages documents. Even online web pages can be read aloud.

Click on the above image: Students describe the use of Text-To-Speech in the classroom

The voice in TTS is computer-generated, and reading speed can usually be sped up or slowed down. Voice quality varies, but some voices sound human. There are even computer-generated voices that sound like children speaking.

[5] http://aem.cast.org/search?query=text+to+speech

[6] https://www.understood.org/en/school-learning/assistive-technology/assistive-technologies-basics/text-to-speech-technology-what-it-is-and-how-it-works

Many TTS tools highlight words as they are read aloud. This allows kids to see text and hear it at the same time. Some TTS tools also have a technology called optical character recognition (OCR). OCR allows TTS tools to read text aloud from images. For example, the student could take a photo of a street sign and have the words on the sign turned into audio.

Check the chapter on **Text To Speech and audiobooks for Classroom Instructional Use** in this publication for detailed descriptions of the various applications and how to download and use them in the classroom.

Video: **Describing the benefits of Text To Speech for students (using ReadSpeaker as the TTS)**

Click on the above image: Text-To-Speech in the

Click on the above image: Describing the benefits of using Text To Speech (TTS) technology

The National Center on Accessible Educational Materials

Cynthia Curry, Director, National Center on Accessible Educational Materials.

This Center contains the most comprehensive resources on accessible educational materials including AEM for remote learning, AEM publications, AEM online courses, information for K-12 teachers, parents, higher education institutions, and multimedia resources on AEM and much more.

Links to the National Center on Accessible Educational Materials (AEM):

- National Center on AEM Home Page
- Remote Learning
- Early Learning and AEM
- K-12 and AEM
- Best Practices for Educators
- Use of AEM
- Personalizing the Reading Experience
- Information for Families
- NIMAC
- NIMAS

Publications Calling for the Use of Text-To-Speech or Audiobooks

This section provides resources from reliable web sources in the form of peer-reviewed journal articles in support of the use of Text To Speech or audiobooks in the classroom. Each article referenced contains its summary with a link in the page's footnote that leads directly to the article.

Audio-Supported Reading and Students with Learning Disabilities

By Richard Jackson, Ed.D. And Joanne Karger, J.D., Ed.D. Published: March 9, 2015[7],

This article, posted on the National Accessible Educational Materials (AEM) website, suggests potential benefits of using AEM such as Text To Speech for Students with Specific Reading-Related Learning Disabilities.

For students whose difficulty rests with decoding or rapid naming of words, it is reasonable to assume that listening to pre-recorded or synthesized (computer-generated) speech can serve several vital functions.

For example, pairing written text with speech helps to sustain engagement during the reading task. Listening while viewing text can connect students directly to the text itself while the meaning of the text can be captured through listening.

[7] http://aem.cast.org/about/publications/2015/audio-supported-reading-learning-disabilities-asr-ld.html

Additionally, listening to text presented synchronously with speech may possibly serve a remedial function, particularly with regard to building speed or fluency. Moreover, early use of voice recorded text may limit the ever-widening gap in learning that is all too often observed in elementary grades with struggling readers (Cunningham & Chen, 2014; Stanovich, 1986).

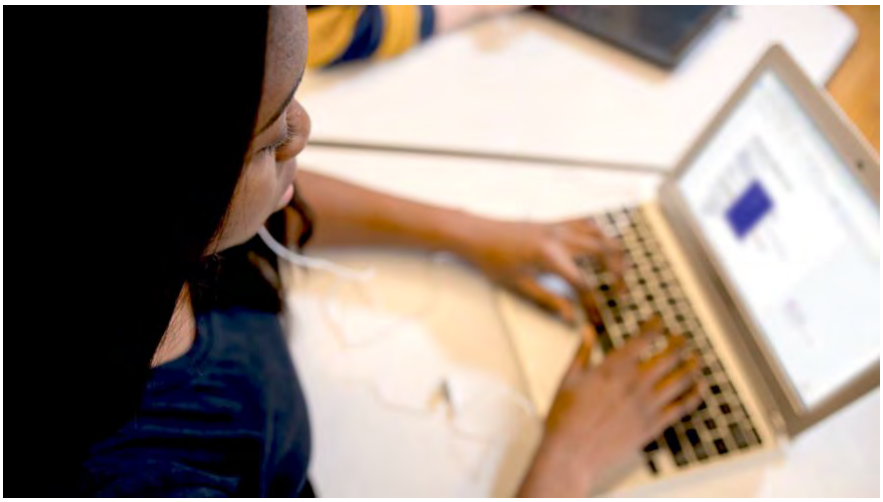
Typical learners who receive high-quality literacy instruction develop rapidly in their acquisition of reading skills. Their general knowledge and vocabulary expand as they read about life in general and the world beyond their direct experience.

Without audio recordings of printed text, these students would be denied the opportunity to learn about and to discuss what their peers are benefiting from through text reading. Thus, for many who struggle with text reading, listening to text affords an opportunity to access and participate in the general education curriculum - i.e., the same curriculum offered to students without disabilities.

Reading Difficulties in the General Education Classroom: A Taxonomy of Text Modification

By Dave L. Edyburn[8]

The article describes a range of remedial approaches to teaching reading skills and poses the premise that if remedial approaches always worked, we would never see high school students who could not read independently beyond the second grade level or middle school students who failed to master the basic math facts. Routine failure to attain appropriate levels of academic performance should trigger assistive technology consideration. That is, compensatory strategies that use technology to enhance performance.



Credit: Don Johnston Incorporated

[8] https://www.qiat.org/docs/resourcebank/ReadingDifficulties.pdf

Assistive Technology and Reading

By Ted S. Hasselbring and Margaret E. Bausch[9]

In this article, the authors suggest that Literacy is one area in which well-applied assistive technologies can act as a lifeline to students with learning disabilities. As many as 8 of 10 students with learning disabilities have reading problems so significant that they cannot read and understand grade-level material (Lerner, 2003).

Learning disabilities often interfere with students' abilities to grasp principles of phonetics, decode text, or comprehend what they read. In our work with schools, we have seen assistive technology break down barriers to full literacy in two ways: 1) as a reading support, meaning that computer-based applications help students with learning disabilities successfully access grade- level text as they read, and 2) as a reading intervention, meaning that the technology helps students strengthen and improve their overall reading skills.

Supportive assistive technology approaches should work symbiotically with learning interventions. In an ideal situation, students can use an assistive technology.

[9] https://imoberg.com/files/Assistive_Technologies_for_Reading_Hasselbring_T.S._Bausch_M.E.pdf

Center on Inclusive Software for Learning (CISL) [10]

CISL is a CAST (Center for Applied Special Technology) project and funded by the U.S. Office of Special Education Programs (OSEP).

CISL views the ability to have text read aloud as a vital access point for many students, and a helpful support to others. Students who may have challenges seeing or decoding text, including those with visual impairments, dyslexia, or who are learning a second language, use text-to-speech technology as well as recorded and in-person human voice to access rigorous academic content. One of our student testers noted that she would use a read aloud feature while reading along with the text in order to stay focused in a noisy environment.

[10] http://cisl.cast.org/research/read-aloud

Reframing the Text-To-Speech vs. Human Audio Debate: Both Make Reading Easier

Published May 2019, by Christine Jones, Associate Director, Bookshare Global Literacy[11]

In this Bookshare blog, Jones notes the value of TTS for the person who is visually impaired and depends on audio interactions to provide directions, read emails, and complete everyday tasks. Or the person with dyslexia who can read with greater ease and comprehension with narrated books because he or she doesn't have to struggle to decode every word.

For individuals with reading barriers, audio is a necessary mode of receiving and processing information. And although some of what they consume today will be human narrated, more and more information will be communicated through technology. Let's face it: digital Text To Speech (TTS) voices are here to stay, and they will only become more common. Thankfully, the quality has improved significantly and will continue to improve every year. Soon, the distinction between human and TTS voices will be negligible.

[11] https://blog.bookshare.org/2019/05/reframing-text-to-speech-vs-human-audio-debate/

Text-to-Speech Technology as Inclusive Reading Practice: Changing Perspectives, Overcoming Barriers.

By Michelann Parr, Schulich School of Education[12]

This article discusses Text To Speech technology (TTS) as an inclusive reading practice that allows students to access their grade level curriculum and improve comprehension/meaning.

It seeks to illuminate concerns and questions that teachers, students, and parents might have regarding to the use of TTS technology. (This article will be addressed in more detail in the section on **"When to Introduce Text To Speech" on page**).

[12] https://www.learninglandscapes.ca/index.php/learnland/article/view/Text-to-Speech-Technology-as-Inclusive-Reading-Practie-Changin-Perspectives%2C-Overcoming-Barriers/618

Exploring Text-To-Speech Readers for Students with Disabilities

By Kara Sevenma[13]

Students with disabilities who struggle with grade-level, content area texts can improve their reading comprehension by using technology to have texts read aloud (e.g., Anderson-Inman & Horney, 2007; Higgins & Raskind, 2004).

Over the past ten years, rapid innovations in Text To Speech (TTS) technologies have created new and affordable ways to help students read print-based or digital texts that have no audio equivalent. TTS technologies provide students with the ability to hear virtually any text read aloud with a synthesized voice.

Students can access PDFs, word processing documents, EPUB files, webpages, emails, and more from virtually any computer, phone, or tablet. There are many TTS readers available and the following list (see the link to the article) provides recommendations for teachers and students that are either already integrated into common classroom devices or are offered as low-cost add-ons that provide comparatively high voice quality.

[13] https://literacyworldwide.org/blog/literacy-now/2014/03/07/exploring-text-to-speech-readers-for-students-with-disabilities

Text-To-Speech Technology and Top Reading Tools For Dyslexia/Learning Disabilities[14]

The Learning Disabilities Resources Foundation suggests that TTS offers a more efficient, practical solution to reading by allowing the user with a learning disability to listen to written words and speech sounds through a read-aloud function.

The read-aloud function addresses the problems experienced by an individual with reading disabilities that include the misidentification of words, slow word reading and connecting text that often results in difficulties with comprehension. It also helps with proofreading.

Listening to your own text will enable you to catch mistakes and easily improve your writing, text messages, email, and social media posts. You can edit the text while listening, pause the text and make the corrections. We recommend the tools that have the option of highlighting the sentence as each word is converted to speech, especially for students, as it gives them a multi-sensory learning experience that can improve their ability to focus, retain information and improve comprehension. See assistive-technology tools. It is also helpful when you suffer from eye fatigue as you can sit, relax and listen.

[14] https://www.ldrfa.org/text-to-speech-technology-and-top-reading-tools-for-dyslexia-learning-disabilities/

Supporting Struggling Readers in Secondary School Science Classes

By Kelly D. Roberts, Kiriko Takahashi, Hye-Jin Park[15]

This article notes that many secondary school students struggle to read complex expository text, such as science textbooks. How can teachers foster expository skills for struggling readers in secondary science classes?

Combining Text To Speech (TTS) software (as a reading compensatory strategy) with a reading comprehension strategy can provide students with both access to grade level material and an approach to reading complex material. This teaching strategy can improve students' attitude toward reading, improve engagement in reading, improve vocabulary and increase comprehension as well as improve their performance in science classes.

[15] https://journals.sagepub.com/doi/10.1177/004005991204400604

Is Text-To-Speech Technology Beneficial for Struggling Readers?

By Amy Foxwell[16]

This article suggests that using Text To Speech as an educational technology to help struggling readers is becoming more common in today's classrooms. However, some may feel that using this technology, which reads text aloud as students as they follow the highlighted text on the screen, is a 'crutch'. Teachers, parents and even students themselves may see this not as a tool, but as cheating.

But recent light being shed on the question shows that not only is TTS not a 'crutch', but it is indeed an invaluable tool to help students improve results and quite importantly, to stay motivated.

Credit: Don Johnston Incorporated

[16] https://www.gettingsmart.com/2015/06/is-text-to-speech-technology-beneficial-for-struggling-readers/

Use of Text-To-Speech Software to Improve Reading Skills Of High School Struggling Readers[17]

This paper presents research findings on the effectiveness of a Text To Speech (TTS) software intervention in two pilot studies with approximately 104 high school students (grades 9-12) with a disability and at-risk for referral to special education services because of reading difficulties. The conceptual framework underlying the research is that the use of TTS software with content reading materials (e.g., social studies) for a minimum of 30 minutes per week improves subjects' reading performance when they are not using the software. Improved reading is also expected to improve subjects' academic performance and aspirations. The results indicated that study participants had significantly improved reading skills in the two pilot studies. The researchers attribute this improvement to students' exposure to more text and incidental vocabulary learning through the use of the TTS software.

[17] https://www.sciencedirect.com/science/article/pii/S1877050912008034

Assistive Technology as Reading Interventions for Children With Reading Impairments with a One-Year Follow-up[18]

By Emma Linfeblad, Staffan Nilsson, Steffan Gustafson, and Idor Svensson

This paper shows that using Assistive Technology (AT) can create transfer effects on reading ability one year after the interventions were finished. This means that reading impaired children may develop at the same rate as non-impaired readers. Also, increased school motivation and an increase in independent learning and family effects have been shown. This provides implications for how to facilitate reading impaired pupils' learning processes and realizes the need to challenge the concept of reading to change to fit modern means of gaining information.

Students are reading Learning Ally human-read Audiobooks

[18] https://drive.google.com/file/d/1SE9AVDxtu5w5zqRGYeF7lJ80eoLfNPgS/view?usp=sharing

On the Importance of Listening Comprehension[19]

By Tiffany P. Hogan, Suzanne M. Adlof and Crystie Alonzo

This publication reviews evidence showing that listening comprehension becomes the dominating influence on reading comprehension starting even in the elementary grades. It also highlights a growing number of children who fail to develop adequate reading comprehension skills, primarily due to deficient listening comprehension skills. Finally this publication discusses key language influences on listening comprehension for consideration during assessment and treatment of reading disabilities.

These authors also cite numerous studies documenting that the contribution of listening comprehension to reading comprehension increases over time. Students who don't get enough practice with listening become poorer and poorer communicators in relation to their peers.

[19] https://www.tandfonline.com/doi/full/10.3109/17549507.2014.904441

Supported eText: Assistive Technology through Text Transformation.[20]

By Lynne Anderson-Inman, Mark A. Horney, Psychology 2007, First Publication January 2, 2007

This publication concludes that although transforming electronic text in ways that might promote text comprehension for struggling readers has generated interest in the research community for more than two decades, we are far from unraveling the complexities of how to do this well. Further, as new technologies emerge, the possibilities for new forms of text transformations and new delivery methods increase. Clearly, there is need for a national research agenda focused on the ways in which transforming text through supportive resources can foster improved comprehension and learning by students with disabilities, as well readers of all ages struggling to learn from printed materials. Virtually all text materials used in schools today and in the future will soon be available in electronic form.

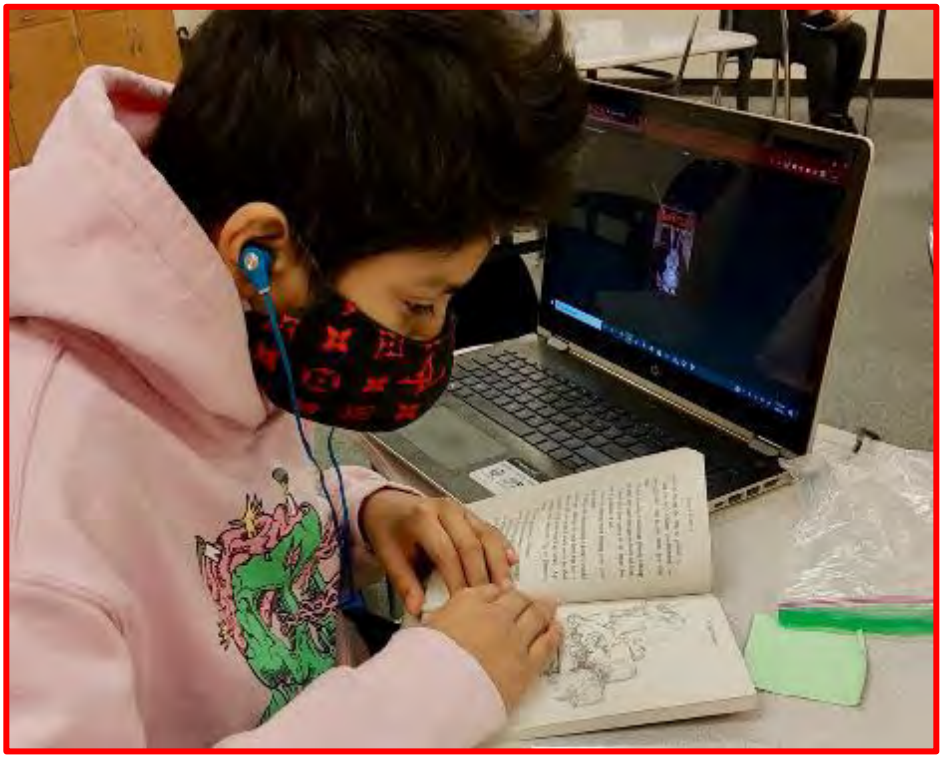
Federal legislation, for example, mandates that all required and supplementary texts adopted by schools be available to students with print disabilities in an electronic form that meets the National Instructional Materials Accessibility Standard (NIMAS, 2003). This makes the need for research on supported eText more urgent as accurate information is needed to guide the development of appropriate materials, instructional interventions, and educational policy related to this form of assistive technology. Ultimately, our vision is of a world in which supported eText is a ubiquitous and effective option for all students, not an accommodation for a select few. We hope our thoughts here about new directions in research related to supported eText as assistive technology will make a contribution toward that end.

[20] https://www.semanticscholar.org/paper/Supported-eText%3A-Assistive-technology-through-text-Anderson-Inman-Horney/77a199eb2cb9635c3f0b46ebc85b83b1e885a06f

Supported eText: Effects of Text-To-Speech On Access and Achievement for High School Students with Disabilities

By Margo Vreeburg Izzo, Amanda Yurick, Bianca McArrel, Journal of Special Education Technology Volume 24, Number 3, 2009 ISSN 0162-6434[21]

The purpose of this study is to examine the effects of a Text To Speech (TTS) screen reader program on the academic achievement of high school students with disabilities in an online transition curriculum emphasizing information literacy. The TTS support was introduced and withdrawn in a reversal design across 10 curriculum units. Findings suggest that the TTS support increased unit quiz and reading comprehension performance with large effect sizes.



[21] https://www.learntechlib.org/p/130514/

Assisted Reading with Digital Audiobooks for Students With Reading Disabilities

By Kelli J. Esteves, Butler University and Elizabeth Whitten, Western Michigan University, Elizabeth.whitten@wmich.edu[22]

Results showed that while all students demonstrated growth in reading fluency as calculated by words read correctly per minute, the growth of the treatment group (using digital audiobooks) far outweighed that of the control group using Sustained Silent Reading (SSR). There was no significant difference in reading attitude scores. Consequently, this study shows that teachers can promote greater growth in reading fluency when assisted reading with digital audiobooks is implemented in place of Sustained Silent Reading.

Students using Learning Ally Audiobook

[22] https://scholarworks.wmich.edu/cgi/viewcontent.cgi?article=1021&context=reading_horizons

TTS and Struggling Readers: The Research Continues

Written by Dr. Heather Pauly, Assistant Professor of Speech & Language Pathology at Concordia University Wisconsin.

The pages previous to this section establish a history of positive impact of Text To Speech or audio-supported reading on those who struggle with reading within the last 20-25 years and prior. There can often be a 20-year lag between research and practice, and as stated previously, this document exists to help bridge that gap. The section that follows is included to pull out and show that the research continues (in the last five years) as more questions are posed. Taken together, the studies that follow reveal support of TTS specifically for those with reading disabilities (including learning disabilities, dyslexia, and those who struggle to read due to intellectual disability). Many studies listed below ask for continued research, as it is common and ethical for a single research study in our field to suggest support rather than prove something definitively. In line with conclusions of the studies listed below, text-to-speech or other forms of assistive technology are one piece of effective reading and writing instruction, but these technologies are crucial in giving students equitable access to classroom content.

Wood, M., Moxley, J. H., Tighe, E. L, & Wagner, R. K. (2018). Does the use of text-to-speech and related read-aloud tools improve reading comprehension for students with reading disabilities? A meta-analysis. *Journal of Learning Disabilities*, *51*(1), 73–84. https://doi.org/10.1177/0022219416688170

Text To Speech (TTS) and related read-aloud tools are being widely implemented in an attempt to assist students' reading comprehension skills. Read-aloud software, including TTS, is used to translate written text into spoken text, enabling one to listen to written text while reading along. It is not clear how effective TTS is at improving reading comprehension. This study addresses this gap in the research by conducting a meta-

analysis on the effects of TTS technology and related read-aloud tools on reading comprehension for students with reading difficulties. Random effects models yielded an average weighted effect size of ($\bar{d}$ = .35, with a 95% confidence interval of .14 to .56, $p < .01$). Moderator effects of study design were found to explain some of the variance. Taken together, this suggests that TTS technologies may assist students with reading comprehension. However, more studies are needed to further explore the moderating variables of TTS and read-aloud tools' effectiveness for improving reading comprehension. Implications and recommendations for future research are discussed.

Keelor, J. L., Creaghead, N., Silbert, N., Horowitz-Kraus, T. (2020). Text-to-speech technology: Enhancing reading comprehension for students with reading difficulty. *Assistive Technology Outcomes and Benefits*, *14*(1), 19–35.

The aim of this study was to investigate the impact of TTS without highlighting, with highlighting, and with increased highlighting rate, on the reading comprehension of children with reading difficulties. Participants read six expository passages under the following conditions: (a) silent Reading, (b) reading Aloud, (c) listening only, (d) reading with the use of TTS with no highlighting, (e) reading with the use of TTS with Highlighting and (f) reading with the use of TTS at a rapid rate with highlighting. They answered comprehension questions following each condition. Data were analyzed using a two-tailed paired t-test and a one-way ANOVA. Reading comprehension was significantly higher for the TTS versus no TTS condition. There was no difference in the presentational features. Comprehension scores for TTS with no Highlighting positively correlated with processing speed; listen only negatively correlated with read aloud speed. TTS is a useful compensatory reading aid for improving comprehension.

Young, M.C., Courtad, C. A., Douglas, K. H., Chung, Y. (2019). The effects of text-to-speech on reading outcomes for secondary students with learning disabilities. *Journal of Special Education Technology*, *34*(2), 80–91. https://doi.org/10.1177/0162643418786047

This study investigated the effectiveness of TTS on the outcomes of reading comprehension and oral reading fluency (ORF) for four secondary students with learning disabilities. The researchers used a single-case A–B–A–B withdrawal design to evaluate the effectiveness of TTS on reading outcomes. All participants scored higher on reading comprehension after using TTS when reading instructional passages and maintained the skills for 4 weeks. Results on participants' ORF also indicated an increased level of words read per minute at the end of each accommodation condition. Comparison of pre- and posttest achievement on the Lexile assessment showed that two of the four participants increased their reading scores. Major findings are discussed with implications for practice and recommendations for future research to increase the use of TTS in the classroom.

Schmitta, A.J., McCalluma, E., Hawkins, R. O., Stephensona, E., & Vicencioa, K. (2019). The effects of two assistive technologies on reading comprehension accuracy and rate. *Assistive Technology, 31*(4), 220-230.
https://doi.org/10.1080/10400435.2018.1431974

This study compared the effectiveness of two assistive technologies to accommodate the word reading skills of four middle school students with reading learning disabilities. Kurzweil 3000 is a continuous TTS computer software program that allows students to follow along on a computer monitor while passages are read aloud. A reading pen is a discontinuous TTS AT device that allows students to scan and hear selected words read aloud. An adapted alternating treatments design was implemented to compare the effects of listening-while-reading using continuous TTS AT, discontinuous TTS AT, and silently reading without accommodation on reading comprehension accuracy and rate. Results indicate that in three of the four participants, continuous TTS technology led to the greatest improvements in both comprehension accuracy and rate when compared to silent reading with effect sizes reaching 0.70 and 0.99, respectively. The fourth participant demonstrated the highest comprehension accuracy and rate in the discontinuous TTS

condition. The discontinuous TTS condition led to the lowest comprehension rates across all four students. Additionally, participants generally found the continuous TTS AT to be the more acceptable of the two accommodations. Discussion focuses on possible theoretical explanations for the results and implications for future research.

Gruner, S., Osterberg, P., & Hedenius, M. (2018). The compensatory effective of text-to-speech technology on reading comprehension and reading rate in Swedish schoolchildren with reading disability: The moderating effect of inattention and hyperactivity symptoms differs by grade groups. *Journal of Special Education Technology, 33*(2), 98-110.

The purpose of this study was to investigate if the compensatory effect of TTS technology on reading comprehension and reading rate in schoolchildren with reading disability is influenced by problems with inattention and hyperactivity and (ii) to examine whether a potentially moderating effect of such symptoms differ between grade groups. Participants (N=49) were randomized into one of the two experimental conditions: Group A listened to a text with TTS, and Group B read the text themselves. The conditions were then switched. Inattention and hyperactivity symptoms were assessed with the Strengths and Difficulties Questionnaire (SDQ).

Statistical analyses were performed both on the whole group and within-grade groups (Grades 3–5 and 6–9). Using TTS technology had a positive effect on reading rate for both grade groups, and this effect was not influenced by attention-deficit/hyperactivity disorder (ADHD) symptoms. As for reading comprehension, the two groups differed both

with respect to the amount of improvement seen in the TTS condition and with respect to the moderating effect of ADHD symptoms. Reading with TTS improved reading comprehension significantly in the younger group, whereas no effect on reading comprehension was found in the older group. A higher score on the SDQ ADHD Scale was associated with less improvement in reading comprehension in the younger group and with greater improvement in reading comprehension in the older group. The results indicate that symptoms of inattention and hyperactivity, as well as the child's grade level, are factors that should be taken into account when planning and introducing TTS technology.

Park, H. J., Kiriko, T., Roberts, K. D., Delise, D. (2016). Effects of text-to-speech software use on the reading proficiency of high school struggling readers. *Assistive Technology*, *29*(3), 146–152. https://doi.org/10.1080/10400435.2016.1171808

The literature highlights the benefits of TTS software when used as an assistive technology facilitating struggling readers' access to print. However, the effects of TTS software use, upon students' unassisted reading proficiency, have remained relatively unexplored. The researchers utilized an experimental design to investigate whether 9th grade struggling readers who use TTS software to read course materials demonstrate significant improvements in unassisted reading performance. A total of 164 students of 30 teachers in Hawaii participated in the study. Analyses of covariance results indicated that the TTS intervention had a significant, positive effect on student reading vocabulary and reading comprehension after 10 weeks of TTS software use (average 582 minutes). There are several limitations to the study; however, the current study opens discussions and presents the need for further studies investigating TTS software as a viable reading intervention for adolescent struggling readers.

Bruno, L.P., Lewis, A. M., Kaldenberg, E.R., Bahr, P. A., & Immerfall, J. (2020). Direct instruction of text-to-speech software for students with intellectual disability. *Education and Training in Autism & Developmental Disabilities, 55*(4), 424-437.

Adults with intellectual disability (ID) often have challenges when accessing written text. One promising way to address this is through the use of AT in the form of TTS software to allow individuals to read aurally, bypassing visual decoding weaknesses. However, little information is available on how to promote effective use of TTS. This study evaluated the efficacy of an instructional program to teach students with ID enrolled in a postsecondary education program to use the TTS tool Snap-&-Read (Don Johnston Inc., 2016). Results indicated that direct instruction is a promising practice to facilitate AT acquisition, yet further research is needed to better understand the impact TTS readers have on reading proficiency and comprehension.

For more support in terms of resources for the classroom, I would suggest the following publications as a guide in addition to what you are currently reading.

Bone, E.K., & Bouck, E. C. (2017). Assessible text-to-speech options for students who struggle with reading. *Preventing School Failure, 61*(1), 48-55.
https://doi.org/10.1080/1045988X.2016.1188366

As students progress through school they spend more time reading to obtain information. Reading to learn can be a struggle for any student, but it tends to be a bigger obstacle for students with disabilities. Using TTA applications and extensions is one way to assist students with disabilities who struggle to independently complete reading assignments. This article presents low-cost TTS options that can be used to support struggling readers, including those with disabilities. Although many quality reading tools exist, this article provides options for teachers and other school personnel trying to balance the needs of students with the realities of school budgets.

Also note that the Council for Exceptional Children (CEC) has a guide specifically to support students with dyslexia. This guide is not limited to TTS, but encompasses multiple forms of AT.

Dawson, K., Antonenko, P., Lane, H., & Zhu, J. (2019). Assistive technologies to support students with dyslexia. *TEACHING Exceptional Children, 51*(3), 226-239. doi: 10.1177/00400599

This resource provides a rationale for using AT with those who have dyslexia in the areas of reading, writing, and spelling. The document summarizes research on AT and dyslexia, then goes on to list many resources for accessing AT including screenshots of how to access existing technology on your own computer as well as other software and websites. The document concludes with specific advice for teachers on how to support a student with dyslexia through AT.

Credit: Don Johnston Incorporated

Factors Influencing the Intelligibility of TTS and Selection of Voices

An OSEP funded CISL publication: the Intelligibility of Text-To-Speech is Critical if it is to be used to Aid Children's Reading Comprehension and Research Shows Multiple Factors Can Influence Intelligibility[23]:

Credit: Don Johnston Incorporated

- **Longer passages and shorter sentences may lead to increased intelligibility.**
  A study of 12 young adults and 12 older adults found intelligibility increased when longer passages (5 - 9 sentences) were read by synthesized speech versus a single sentence. The authors hypothesized that shorter sentences would further increase intelligibility versus longer sentences.
  Drager Reichle, 2001

[23] http://cisl.cast.org/research/read-aloud

- **Providing students with the ability to alter the rate of speech might help optimize their use of TTS software.** Research as early as 1985 has shown that the rate and pitch of synthesized speech also affects intelligibility. A study with 48 undergraduate students found that if the speech rate is too fast or if pitch does not sound similar to human speech, there can be negative effects on reading performance.
  Slowiaczek Nusbaum, 1985

- **TTS systems should make efforts to provide synthesized speech as close to a natural human voice as possible to increase intelligibility.** Two studies conducted more recently compared people's preferences regarding the naturalness of text-to-speech systems. Both studies found people preferred voices that sounded more natural, choosing a live human or a recorded human voice over synthesized speech.
  Couper, Singer, Tourangeau, 2004
  Stevens, Lees, Vonwiller, Burnham, 2005

- **There may be other ways to increase users' satisfaction with read-aloud features that are not directly related to intelligibility: One option is to use professional human voices.** A study of 826 Amazon Mechanical Turk participants found that professional human voices are perceived as better than amateur human voices and synthesized voices, and that some types of synthesized voices are perceived as better than amateur human voices.
  Georgila, Black, Sagae, Traum, 2012

- **If users are able to choose the gender of the read aloud voice, they may be more motivated to engage with the reading.** Two studies conducted with undergraduates on the effects of gendered voices in synthesized speech found that gender stereotypes did in fact extend to synthesized speech. Additionally, Lee, Nas, and Brave (2000) demonstrated that male listeners identified more strongly with the male computer voice, while female listeners identified more strongly the female computer voice.
  Nass, Moon, Green, 1997

Lee, Nass, Brave, 2000

- **Emotional tone and pitch also play a role in listeners' perceptions of content and its credibility.** The two studies below explore how synthetic speech affects listeners. In one with 56 university students, researchers investigate whether adding emotion to synthesized speech could affect listeners' perceptions of the content. They found happy voices made both happy and sad content seem happier than when a sad voice was used. However, there was less of an effect with TTS software than with recorded human speech. There was also an effect on listeners' perception of the credibility of the voice. A neutral voice was perceived as more credible even though listeners preferred the happy voice. The other study looks at how software interprets the connotation of text compared to humans. Researchers found that there was poor alignment between how text was interpreted by humans and the software, where the software would tend to interpret text as more negative. They hypothesize that this could be a reason that synthetic TTS voices are seen as inferior to human voices and are often interpreted as "sounding off" by listeners.

Using Text To Speech on a laptop via Google Doc

Nass, Foehr, Brave, Somoza, 2001

Hillaire, Iniesto, Rienties, 2019

An American Assistive Technology Company Built by an Individual Considered to Have Learning Problems in School

Written by Ruth Ziolkowski

The Don Johnston Incorporated company provides learning tools to over 4,000 school districts to benefit over 1,500,000 students around the country.

This company was founded by Don Johnston, a struggling reader considered to be a student with learning problems by his teachers, except one, his 8th grade teacher, Mrs. Tedesco. She recognized that Don does not have learning problems, he just learns in a different way, and the rest is history.

Ruth Ziolkowski, OTR, MBA. President, Don Johnston Incorporated

Here are excerpts from Don Johnston's autobiography Building Wings: "Hello, my name is Don Johnston and for many years, teachers told me I had a learning problem. And for most of my life, I believed there was nothing I could about it. Some of my classmates called me stupid. Some of my teachers said I was lazy. But then I found out something that changed my life. I found out that I could learn - I just learned in a different way."

"I often wonder what my life would be like today if Mrs. Tedesco had not been my teacher in eighth grade. Mrs. Tedesco believed in me, and every student needs someone like that."

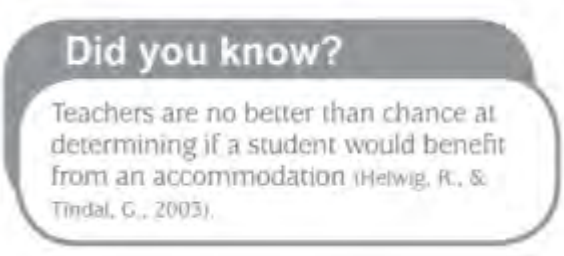
50+ years later, students with literacy disabilities continue to share similar stories of negative assumptions, emotional pain and lack of confidence. Stories from students like Pthara, Kayle or Gavin demonstrate common struggles. However Don, Pthara, Kayle and Gavin's stories shift often by a single teacher who has high expectations, embraces

assistive technology (AT), uses data-driven decision-making and never gives up on students.

What worries me most are the students who never had a teacher like Mrs. Tedesco or whose IEP team didn't have the tools or the data to see a student's strengths or the skills in Assistive Technology (AT). IDEA 1997 specifically requires that AT be considered for every student with a disability as part of the IEP process. Yet 15 years later a longitudinal study by Bouck, Maeda and Flanagan (2012) demonstrates only 7.8% of students report receiving AT. The data is broken down by disability groups and those with "hidden" disabilities such as learning disabilities have the lowest reported numbers of those receiving AT. This begs the question, what is happening in the AT consideration process?

Don Johnston, Founder of Don Johnston Company

Helwig and Tindal (2003) found that teachers were no more successful than chance at identifying students who would benefit from read-aloud testing accommodations. Think about it, "chance" is the equivalent of flipping a coin! Crawford & Ketterlin-Geller (2010) describe several ways IEP teams make decisions and two that stand out are qualitative judgements and ability to implement. Look at your caseload, school or district: what is the data on students with IEPs and reading goals? What percentage of students have reading accommodations? What percentage of students below proficient on standardized tests have reading accommodations? Of these students, what percentage of the IEPs specifically mention a



Text To Speech (TTS) vs human read-aloud? These gaps occur for many reasons. If the ability to implement is a key factor in accommodation decision-making, it makes sense. It is much easier for a teacher or paraprofessional to quickly read aloud to students. To recommend a text reader means the teacher, student, parent and IEP team need to learn how to use a text reader. The student must have access to technology to support it. The 2020 pandemic has shed light on equity of access to technology and internet access. Let's face it, using a text reader is a lot more work than quickly reading to the student or having a paraprofessional available to support the student. Even if it perpetuates dependency, the system will prefer human readers over AT.

I remember a day when I received a call from an AT specialist. She talked about a high school student who completed an AT evaluation and both the student and AT specialist experienced instant success. The student declared, "Now I can be a doctor." While the story is exciting, I started to feel urgent and anxious. Why did this student have to wait until high school for a first experience with AT? What prompted an AT evaluation for this student? Most importantly, how many students are still missed every year? I came to the conclusion that we have an AT equity problem. The Bouck, Maeda and Flanagan (2012) study clearly demonstrates the AT equity problem.

After 30 years leading an Assistive Technology company, it is clear that systematic shifts are needed. For the past several decades in AT, I would characterize the focus primarily on professional development and availability or AT and technology. After 3 decades of professional development, why are teachers still underutilizing AT?

I believe we need three (3) systemic shifts to AT.

Shift from	To
Qualitative decisions and the lack of quantitative data	Screening using a data-driven approach for high incidence disabilities and reading. Ensure decisions are not dependent on the skill of staff or the mix of people on their IEP team.
Professional Development for Teachers	Student-led approach. Professional Development for students **and** Teachers. Putting the student first in everything we do. Build capacity by training students. AT usage cannot be dependent on a single staff member. By training students, we normalize the AT, build capacity and ultimately build skills in students' ability to use AT.
AT Expert Model	Ensure equity through a data-driven, Capacity-Building Model. Building a systematic approach that recognizes the heterogeneity of each student while building systems that are not dependent on AT experts.

Screening…Ensuring Equity

Why does our country require hearing screenings for all children? The National Center for Hearing Assessment and Management stated that "Left undetected, hearing impairments in infants can negatively impact speech and language acquisition, academic achievement, and social emotional development." This is a proactive approach to maximize outcomes. Unfortunately, system forces in education treat AT as a solution of last resort especially for students with high incidence disabilities.

Most districts have small AT teams. Try this simple math problem: take the number of students with disabilities who are not proficient on your standardized reading assessment, and divide that number by the number of people on your AT team. For example, a district has 3,000 students with IEPs who are not proficient in reading. If the district has 5 AT team members, this means each AT professional needs to evaluate 600 students. If the average AT caseload is 100 students, you would either need 6 years for that AT professional to get to every student just 1 time (half of the student's academic life) or you would need to expand your AT staff from 5 team members to 30 just to address the reading AT needs. Because of this, AT works in a triage mode. In triage only the most urgent or most likely to get outcomes will be served. Triage is not a path to equity and hence we continue to see low reading scores on standardized assessments. Some have tried checklists to empower teachers to make these decisions however this approach still does not ensure equity.

Hehir (2007) states that academic deficits may be exacerbated by the ingrained prejudice against performing activities in "different" ways that might be more efficient for disabled people—such as reading Braille, using sign language, or using TTS software to read. So often, policy, instruction and intervention assumes we should work to overcome the disability first. We often wait for intervention to demonstrate lack of progress and then we consider AT. So why not start to screen students for AT early? What if we embraced AT as part of the intervention plan? Shaywitz (2003) states that "The majority of students with learning disabilities have reading disabilities and there is evidence that students do not outgrow such disabilities." Using AT as a system of last resort reinforces an ableist

approach. It dishonors our students instead of embracing their disability and allowing their strengths to lead their learning. With screening we can come closer to equity for all.

Protocol for Accommodations (PAR)

PAR Protocol for Accommodations in Reading (available free) was developed to ensure that no student had to wait for a teacher like Mrs. Tedesco or an AT expert to get what they needed. Through screening, solid data can identify students who benefit from reading accommodations. PAR quantifies the benefit of a text reader into grade-levels. The data driven approach used in PAR shifts perceptions. We have seen interventionists who were worried that text readers would cause harm to students shift or challenge their assumption. We have seen teachers understand the importance of AT for students and even shift decisions on LRE placements. We have seen AT specialists change AT recommendations using this data. We have heard amazing stories such as teachers crying, saying “I never knew”. PAR used as a screener makes equity possible. Just like hearing screenings, if we want equitable access, we need to start with a data-driven screener.

Student-Led Learning: Putting Students First

uPAR (Universal Protocol for Accommodations in Reading) has had a dramatic impact on students' self-perception and reader profile as well. Helwig and Tindal (2003) found that “Students appear to be no more accurate than teachers in their perceptions of the actual or potential impact of an accommodation on their test performance." Fuchs et al, Helwig & Tindal 2003, Elbaum, Arguelles, Campbell, Saleh (2004) found, "The experience of the accommodation in and of itself did not provide students with an accurate basis for determining whether they would be appropriate candidates for this accommodation." After seeing their uPAR data, we have heard students expressing, “You told me I was smart but I never believed you" or "I can do anything I want now” or “I guess this means I should use my AT.” uPAR data presented to students has changed their vision of who they are as a reader. They see their strengths, not just their weaknesses. Once they revise their reader profile, their learning profile starts to shift. We owe it to our

students to truly know if they would benefit. We also owe it to our students to build their skills and capacity.

Once we identify which students benefit from reading accommodations (human reading or text-reader) we immediately start to train the students. For too long the entire focus was on training teachers. We were disappointed to find that the teachers were not confident enough in using AT to offer training to students. More training never seemed to fix this issue. Teachers are busy and it is easier to read aloud or ask someone else to read aloud for the student yet this also creates human dependency. Success in life for students with disabilities requires self-advocacy, self-determination, self-efficacy and more. If we do not take the time to train students and build their skills and then patiently allow them to use their skills, we temporarily feel success of homework completion but should we ask: are we creating a system where a student will require human assistance for life? Using AT takes more time initially but in the long term the benefits are extreme. Bouck Maeda, Flanagan (2003) found that 99.8% of students using AT graduated compared to 76.8% who did not.

AT Services include selection, acquisition and use. While selection and acquisition are relatively simple and fast, AT use requires careful planning and ongoing attention. Students need explicit instruction and skills. A thoughtful approach to AT implementation comes from the work of Dr. Janice Light in building communication competence for students with Augmentative and Alternative Communication (AAC) systems. She identified four key competencies; Operational, Functional, Strategic and Social.

We often focus our teachers on the skill they are least comfortable with such as Operational Competency with AT. Yet many teachers are really good at building routines

and helping students think strategically about approaches to problem solving. Using this framework, we have created tools and supports for both students and teachers. Approaching everything through a Student-Led approach shifts everything.

For example, building Operational Competence: instead of training the teacher who will then train the student, why not give the student the ability to learn for themselves or the ability for the teacher and the student to learn together. Districts using Snap & Read look to Don Johnston to build capacity.

The Don Johnston Learning Academy

The Don Johnston Learning Academy is the place for students **and** teachers. Students use self-paced learning modules that last 30 minutes or less. One of our favorite strategies is honoring students' new skills and building on those skills as they then train others. We have seen 4th graders train their teachers. We have seen 3rd-5th graders training the entire district administrative staff including the superintendent. This provides the student a gift that will not only increase their Operational Competence but also build Social Competence. For the system, it builds capacity, awareness and a feeling of a student-led culture.

As students learn specific features, they still need to understand how to use them in the context of actual classwork they will encounter. To help with Functional Skills we created Snap Explorer. SnapExplorer.com provides video demonstrations of students using specific features of Snap & Read to gather textual evidence, for example. Snap Explorer supports not only the student but also the teacher by providing model Specially Designed Instruction lesson plans, UDL

adaptations and more. Finally, time must be spent to strategically look at all their work across subjects and also the type of assignments and educational expectations. Often a student might use a text reader to listen to a book yet fail to understand they can have the same support during a test. As they strategically identify tasks to use their tools, they will need support to build self-advocacy skills to ask for the support and deal with staff whose assumptions might limit their use.

"The greatest gifts you can give your children are the roots of responsibility and the wings of independence." ~ Denis Waitley

In Summary

When Don was in school, technology consisted of punch cards and computers that filled an entire room. Personal computers and IDEA were non-existent. Yet stories of students with disabilities continue to demonstrate ableism is alive and well even with the passage of IDEA. Test scores continue to demonstrate that students with disabilities as a subgroup are lower than other subgroups and that change is needed.

Fifty plus years later, the 2020 pandemic raises awareness and creates urgency for equitable access to both technology and the internet for all students. We need the same expectations for students with reading disabilities. "For people without disabilities, technology makes things easier. For people with disabilities, technology makes things possible" - IBM Training Manual. It is time for all students with reading disabilities to have access to the reading technology they deserve, not just a reading access in their ELA book but access everywhere. Students with reading disabilities require reading technology and digital texts everywhere; every subject, every assignment, for quizzes, worksheets, standardized tests and most importantly any reading material that the student wants to interact with.

At Don Johnston Incorporated, we are passionate about AT, Districts, teachers, parents and students share amazing stories of success. We are driven by the fact that many students still do not have access or have not received the appropriate tools and training. We are driven by the students labeled as lazy or a behavior problem because we know this means Ableism still exists. Our vision is to change the education experience for students with disabilities. To honor the students, to prepare them to navigate a system that unintentionally undermines opportunities. We believe in building high expectations like Mrs. Tedesco did, focusing on students' strengths rather than their weaknesses. And to honor the whole child and explore different pathways of learning. For years, Don felt that reading was all about decoding. In 9th grade, reading a book on Inventors, reading finally clicked for him. It was about being lost in the book, making connections, being inspired.

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UDL and Text To Speech

Where does Text To Speech fall within the UDL framework?

Website Citation: CAST (2018). Universal Design for Learning Guidelines version 2.2. Retrieved from http://udlguidelines.cast.org

As noted on the UDL framework chart above (see underlined in red), Text To Speech falls within the:

- Representation Network, which includes:
  - The Perception Guidelines, which includes:
    - Checkpoint 1.1 Offers alternatives to visual information
      - Text To Speech

The following information, obtained from the CAST website, describes in more details how Text To Speech fits within the above UDL framework.

Representation

Learners differ in the ways that they perceive and comprehend information that is presented to them. For example, those with sensory disabilities (e.g., blindness or deafness); learning disabilities (e.g., dyslexia); language or cultural differences, and so

forth may all require different ways of approaching content. Others may simply grasp information quicker or more efficiently through visual or auditory means rather than printed text. Also learning, and transfer of learning, occurs when multiple representations are used, because they allow students to make connections within, as well as between, concepts. In short, there is not one means of representation that will be optimal for all learners; providing options for representation is essential.

Perception

Learning is impossible if information is imperceptible to the learner, and difficult when information is presented in formats that require extraordinary effort or assistance. To reduce barriers to learning, it is important to ensure that key information is equally perceptible to all learners by: 1) providing the same information through different modalities (e.g., through vision, hearing, or touch); 2) providing information in a format that will allow for adjustability by the user (e.g., text that can be enlarged, sounds that can be amplified). Such multiple representations not only ensure that information is accessible to learners with particular sensory and perceptual disabilities, but also easier to access and comprehend for many others.

Checkpoint 1.3: Offer alternatives for visual information

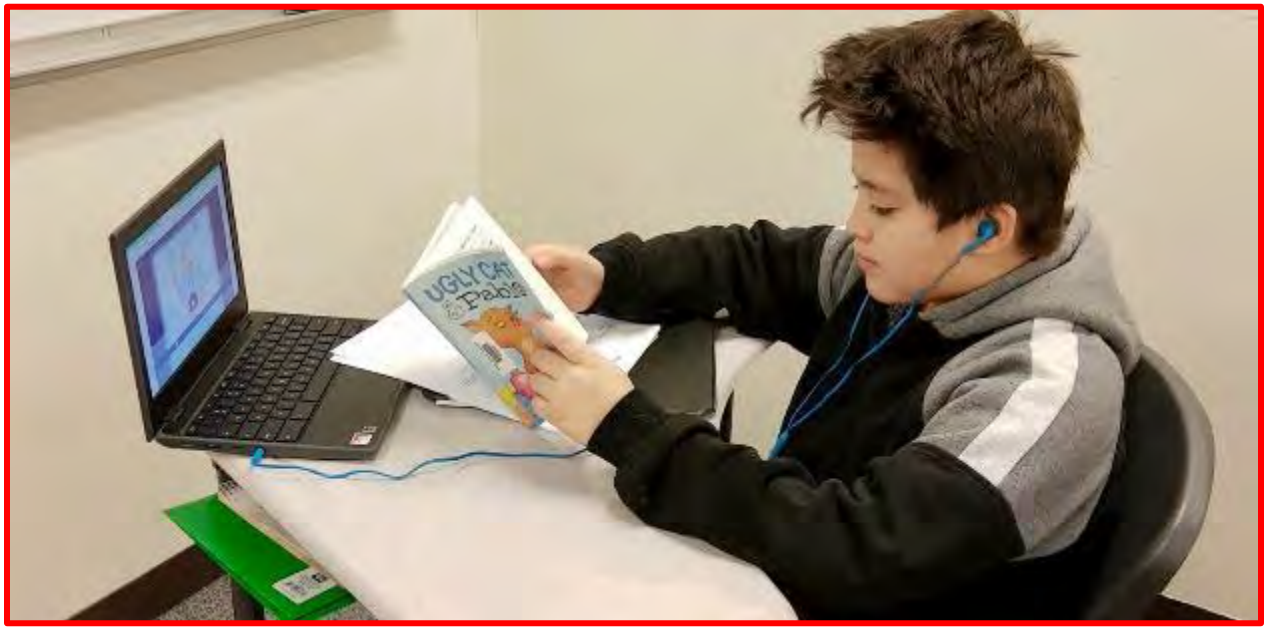
Images, graphics, animations, video, or text are often the optimal way to present information, especially when the information is about the relationships between objects, actions, numbers, or events. But such visual representations are not equally accessible to all learners, especially learners with visual disabilities or those who are not familiar with the type of graphic being used. Visual information can be quite dense, particularly with visual art, which can have multiple complex meanings and interpretations depending on contextual factors and the viewer's knowledge base. To ensure that all learners have equal access to information, it is essential to provide non-visual alternatives.

- Provide descriptions (text or spoken) for all images, graphics, video, or animations
- Use touch equivalents (tactile graphics or objects of reference) for key visuals that represent concepts
- Provide physical objects and spatial models to convey perspective or interaction

- Provide auditory cues for key concepts and transitions in visual information

Text is a special case of visual information. The transformation from text into audio is among the most easily accomplished methods for increasing accessibility. The advantage of text over audio is its permanence, but providing text that is easily transformable into audio accomplishes that permanence without sacrificing the advantages of audio. Digital synthetic text-to-speech is increasingly effective but still disappoints in its ability to carry the valuable information in prosody.

- Follow accessibility standards (NIMAS, DAISY, etc.) when creating digital text
- Allow for a competent aide, partner, or “intervener” to read text aloud
- Provide access to text-to-speech software



When to Introduce Text To Speech?

As we consider this all-important question, **the following four elements need to be addressed within this context**:

1. school districts' IDEA 2004 obligations to students with IEPs to access and progress in their regular grade level curriculum.
2. reading development areas.
3. progression of reading development across grade levels.
4. can reading Instructions co-exist with Text To Speech?

School Districts' IDEA 2004 Obligations

The intent of IDEA 2004 is to ensure that students with disabilities have access to, be involved in, and make progress in the general curriculum.

How then, can a student with disability, reading at the 1st grade level have access to, be involved in and make progress in the 4th grade level curriculum?

IDEA 2004 recognizes that in order for these students to access the general curriculum, they need Accessible Educational Materials (AEM) such as Text To Speech. For that purpose, Congress created the National Instructional Media Accessibility Center (NIMAC) that makes Text To Speech available (through Accessible Media Producers (AMPs) to qualifying students with IEPs.

As reading development and its progression across grade levels is considered, the discussion must be infused with school districts' legal obligations to provide students with IEPs accessibility to their grade level curriculum. The segments '*Can reading instruction co-exist with Text To Speech?*' and *'Conclusion' which follows*, address the balance of providing reading instructions and Text To Speech as school districts must comply with their legal obligations under IDEA 2004.

Reading Development Areas

- The 2019 publication *Children Experiencing Reading Difficulties* by the International Literacy Association[23], highlights the work of **Catherine Snow** in identifying areas that are specifically important to:
  - reading development
  - phonemic awareness (discriminating individual sounds in words)
  - phonics (linking letters and sounds)
  - fluency (reading words automatically with understanding)
  - comprehension (making sense of text)
  - vocabulary (knowing what the words mean)
  - writing (composing and spelling)

Dr. Catherine Snow, National Authority on Reading Instruction

- Other studies substantiate the importance of the above important areas for language development. For example, Michael F. Hock and his colleagues conducted a 2009 study on *What Is the Reading Component Skill Profile of Adolescent Struggling Readers in Urban Schools*[24]? Participants were assessed in the domains of word level, fluency, vocabulary, and comprehension. Analysis of the results found that 61% of the struggling adolescent readers had significant deficits in all the reading components listed above. Subgroups of struggling readers showed similar but more severe patterns. For example, students with learning disabilities scored significantly below the levels of the struggling reader group at large.

[24] https://www.lexplore.com/en/the-developmental-stages-of-learning-to-read/

The Progression of Reading Development

Jeanne S. Chall on Stages of Reading Development

Stage 0. Prereading: Birth to Age 6. The Pre-reading Stage covers a greater period of time and probably covers a greater series of changes than any of the other stages (Bissex, 1980). From birth until the beginning of formal education, children living in a literate culture with an alphabetic writing system accumulate a fund of knowledge about letters, words, and books. The children grow in their control over various aspects of language—syntax and words. And they gain some insights into the nature of words: that some sound the same at their ends or beginnings (rhyme and alliteration), that they can be broken into parts, and that the parts can be put together (synthesized, blended) to form whole words.

Stage 1. Initial Reading, or Decoding, Stage: Grades 1-2, Ages 6-7. The essential aspect of Stage 1 is learning the arbitrary set of letters and associating these with the corresponding parts of spoken words. In this stage, children and adults interiorize cognitive knowledge about reading, such as what the letters are for, how to know that *bun* is not *bug*, and how to know when a mistake is made. This stage has been referred to pejoratively as a “guessing and memory game,” or as “grunting and groaning,” “mumbling and bumbling,” or “barking at print,” depending on whether the prevailing methodology for beginning reading instruction is a sight or a phonic approach. The qualitative change that occurs at the end of this stage is the insight gained about the nature of the spelling system of the particular alphabetic language used.

Stage 2. Confirmation, Fluency, Ungluing from Print: Grades 2-3, Ages 7-8.6. Essentially, reading in Stage 2 consolidates what was learned in Stage 1. Reading stories previously heard increases fluency. Stage 2 reading is not for gaining new information, but for confirming what is already known to the reader. Because the content of what is read is basically familiar, the reader can concentrate attention on the printed words, usually the most common, high-frequency words. And with the basic decoding skills and insights internalized in Stage 1, the reader can take advantage of what is said in the story and book, matching it to his or her knowledge and language. Although some additional, more complex phonic elements and generalizations are learned during Stage 2 and even later, it appears that what most children learn in Stage 2 is to use their decoding language, and the redundancies of the stories read. They gain courage and skill in using context and thus gain fluency and speed.

Stage 3. Reading for Learning the New: A First Step. When readers enter Stage 3, they start on the long course of reading to "learn the new"—new knowledge, information, thoughts, and experiences. Because their background (world) knowledge, vocabulary, and cognitive abilities are still limited at this stage, the first steps of Stage 3 reading are usually best developed with materials and purposes that are clear, within one viewpoint, and limited in technical complexities. This is in contrast with Stage 4 where a multiplicity of views, complexity of language and ideas, as well as subtleties of interpretation are the expected.

Stage 4. Multiple Viewpoints: High School, Ages 14—18. The essential characteristic of reading in Stage 4 is that it involves dealing with more than one point of view. For example, in contrast to an elementary school textbook on American history, which assumes Stage 3 reading, the textbook at the high-school level requires dealing with a variety of viewpoints. Compared to the textbooks in the lower grades, the increased weight and length of high-school texts no doubt can be accounted for by greater depth of treatment and greater variety in points of view. Stage 4 reading may essentially involve an ability to deal with layers of facts and concepts added on to those acquired earlier. These other viewpoints can be acquired, however, because the necessary knowledge

was learned earlier. Without the basic knowledge acquired in Stage 3, reading materials with multiple viewpoints would be difficult.

Stage 5. Construction and Reconstruction—A World View: College, Age 18 and Above. When Stage 5 is reached, one has learned to read certain books and articles in the degree of detail and completeness that one needs for one's purpose, starting at the end, the middle, or the beginning. A reader at Stage 5 knows what not to read, as well as what to read. To reach this stage is to be able to use selectively the printed material in those areas of knowledge central to one's concern. Whether all people can reach Stage 5 reading, even at the end of four years of college, is open to study.

Can Reading Instructions and Text-To-Speech Co-exist?

Dr. Dave Edyburn, Senior Research Scientist and Professor Emeritus at the University of Wisconsin at Milwaukee, addresses the works of reading researchers like Catherine Snow and Jeanne Chall about the typical progression of reading development. These models highlight the importance of preschool readiness activities, and the fundamental reading instruction provided in grades K-3 where the curriculum focuses almost exclusively on *Learning to Read*. Yet, reading is far more than decoding and identifying individual words on the printed page (Parr, 2008).

However, in grade 4, there is a significant change in the curriculum.

That is, the expectations are that students have mastered the mechanics of reading and are now ready to focus on *Reading to Learn*. In Chall's model this involves:

- Stage 3 – Reading for learning the new,
- Stage 4 – Understanding multiple viewpoints,
- Stage 5 – Construction and reconstruction of text, meaning, and insights

Jeanne Chall's Stages of Reading

This change begins in middle elementary school and continues through post-secondary education. The fundamental challenge students, teachers, and parents must confront is how to help a student gain access to text when they do not have the independent reading skills? There will never be sufficient time to teach them the reading skills they need to complete each of their assignments. Without intervention, students can slide into a deep

abyss because there are relentless demands to do tasks that they cannot do. Legally, schools are required under IDEA 2004 to provide interventions such as Accessible Educational Materials (AEM) for students with disabilities to access grade level curriculum.

Reading researchers have documented the Matthew Effect (Stanovich, 1986), where small differences in reading skills become large differences over time. Every classroom teacher has ample evidence about students who read above grade level, read at grade level, and struggle because they read several levels below grade level. The lessons of the Matthew Effect, as well as lessons from the achievement gaps, demonstrate that students' reading achievement gaps tend to harden over time, rather than close. So, we must consider the evidence of doing nothing. That is, if we fail to intervene, many students with disabilities will end up as another statistic demonstrating below grade level reading skills. Despite the legal mandate of IDEA 2004 for IEP teams to consider assistive technology when planning students' IEPs. There is no evidence over the past 20 years that Assistive Technology (AT) such as Text To Speech has been deployed in ways that close the achievement gap. As a result, there is an urgent need to do more!

There are several metrics that IEP teams should use in making decisions about Text To Speech. IEP teams are in the unique position of determining what is best for each child with a disability. Edyburn (2007) has described terms equivalent to Reading Instruction (R) and Text To Speech (TTS)**.** Together, these 2 terms provide a method for determining the percentage of time that should be devoted to R and the percentage of time that should be devoted to using TTS to gain access to text.

Refusing to provide access to any AT means the team has decided the equation should be set at: **100% R – 0% TTS**. However, we must argue against this inaction. As we have seen, doing what we have always done simply hardens the achievement gap.

- For example, for a student with a disability in 2nd grade (see Figure 1 below), an IEP team may wish to set the R - TTS equation to **70% R - 30% TTS** to continue providing high quality reading instruction but also providing Text To Speech to enable the

Figure 1

student to gain access to stories, vocabulary, and instructional content that would otherwise be inaccessible because of below grade level reading skills. Research by Parr (2008) has found that the decision to use TTS does not need to be an either or decision (i.e., use – not use), but can be readily incorporated in the classroom to be used side-by-side with R as educators help all students in their emerging literacy development. This is a key finding as schools implement Multi-Tiered System of Support (MTSS) and Universal Design for Learning (UDL) in the general education classroom.

- For a child in 3rd grade, the IEP team may wish to explore the R - TTS equation at **50% R - 50% TTS.**
- In grades 4 and beyond, the R - TTS equation may need to be reset such that more effort is devoted to TTS technologies since minimal reading instruction is provided in the general education classroom. Therefore, it is not unreasonable to consider an R - TTS equation at **20% R - 80% TTS** for students in middle school and beyond.

As students advance through the grades and the reading/achievement gap grows, it may be necessary for the IEP team to develop a cocktail of interventions. That is, providing the student with multiple interventions (Parr, 2011) to make text accessible in ways that enable them to understand the core concepts of a text.

More information about measuring outcomes of TTS AT is provided on ***Data Collection*** in the publication. However, teachers, parents, and the IEP team will know if the R - TTS equation is not properly balanced because a student will avoid reading for pleasure, will fail to complete reading assignments, will spend inordinate amounts of time trying to gain access to text but do so with poor comprehension, and will lack content knowledge that has been acquired by their peers. Individually and collectively, these behaviors are an urgent call for AT like TTS (Edyburn, 2007; Wilcox & Parr, 2017). Failure to intervene with appropriate supports often results in particularly negative outcomes: the student learns to hate reading, has internalized a self-fulling prophecy that they can't read, and perhaps most damning, they begin to hold a world view where they tell themselves that not being able to read means that they can't learn.

Reading is a core life function. Similar in some ways to the need for some individuals to use alternative and augmentative communication (AAC) AT devices to support communication, there is a tendency to wait before intervening. The research evidence is strong and exceedingly clear: providing individuals with a method of communicating, the earlier the better, improves a variety of outcomes relative to independence, education outcomes, and quality of life (Dunst, et al., 2013; Morin, et al., 2018; Romski, et al., 2015). It is very clear that we are foolish to think that continuing to do what we have always done (i.e., withhold reading AT) will produce different outcomes (i.e., successful voracious readers).

Additional Supportive Studies

Many studies that are cited throughout this publication suggest that (TTS) and the traditional reading instruction can coexist side by side. The use of TTS provides instant

access to grade level books and materials. TTS may prevent the cycle of frustration, anger and withdrawal attributed to inaccessible curriculum / reading deficits in decoding. These studies suggest introducing TTS as soon as a gap is emerging.

Kelsey Hall and Diana Petschauer noted in their 2017 article posted in the Closing the Gap website: *Supporting Learners with Dyslexia: Technology and Intervention CAN Play Nice*, that in addition to technology that supplements skill acquisition, individuals may benefit from using TTS and TTS software to effectively and efficiently participate in classroom tasks and assignments. Some educators may question the use of audiobooks or TTS software for individuals who are learning to read, however, it is important to allow individuals access to grade level (or above) text to encourage continued vocabulary and language growth.

Many educators are unaware of federal laws that protect individuals with disabilities and their rights to accessible educational materials (AEM such as audiobooks). Additionally, this technology bridges gaps by supporting access to the same content and curriculum as learners' peers, which aids in reducing frustration and prevents them from falling behind in classwork.

Another article that addresses this issue is *Text-to-Speech Technology as Inclusive Reading Practice: Changing Perspectives, Overcoming Barriers*[25], By Michelann Parr, Schulich School of Education.

[25] https://www.learninglandscapes.ca/index.php/learnland/article/view/Text-to-Speech-Technology-as-Inclusive-Reading-Practie-Changin-Perspectives%2C-Overcoming-Barriers/618

Dr. Parr states that the dilemma that many educators are confronted with on a daily basis is this: if a child repeatedly fails to read and to understand printed text, how much data documenting this failure needs to be gathered before we have enough evidence that the child can't perform the task? (Edyburn, 2006) When do we intervene? And what do we do? (Edyburn, 2007, p. 149).

The reading research has long investigated reader differences, why readers struggle, what happens when readers struggle, how best to intervene, and how best to support. Traditional reading interventions (Dolan, Hall, Banerjee, Chun, & Strangman, 2005; Rose & Meyer, 2000) are often designed to support readers' ability to decode and make the connection between the sounds heard and letters read.

While systematic phonics instruction (Adams, 1994; National Reading Panel, 2000) benefits many children, there is a group of students who may never achieve a level of speed, fluency, and accuracy that supports their emotional, social, cognitive, and intellectual development. The problem is one of information processing: by the time they have successfully decoded the word, they have little to no energy or capacity left to solve the word, let alone make sense of it, and then do something with it (i.e., comprehend, respond) (Hirsch, 2003). As a result, many of these students enter into a vicious cycle of withdrawal from text, which widens the gap between those who read well and those who don't, referred to as the Matthew Effect (Stanovich, 1986).

Bypassing decoding issues, TTS may prevent the cycle of withdrawal often attributed to inaccessible curricula, low levels of motivation, lack of confidence, and/ or reading deficits

in phonemic and phonic awareness (Bryant & Bryant, 1998; Day & Edwards, 1996; Dolan et al., 2005; Hitchcock & Stahl, 2003; Hodge, 2003; Lewis, 1998; Kellner, 2004; Raskind & Higgins, 1998; Sipe, 1999). It may also reduce reliance on "human" supports in a variety of contexts, therefore enhancing independence (Cople & Ziviani, 2004; Labbo & Reinking, 1999; LD Online, 1998; Pisano, 2002)."

Dr. Parr suggests that TTS offers a solution to this dilemma, particularly if it is viewed as an inclusive practice or way of reading. Now, this is not to recommend that TTS be used as a program for teaching reading, nor that we bypass decoding issues in lieu of teaching decoding. Instead, Dr. Parr suggests that TTS may circumvent frustration and reader withdrawal due to inadequate decoding and fluency, freeing readers to do the real work of reading, which is making meaning. In this way, TTS supports the overall acquisition of literacy, and learning, as students continue to receive other forms of intervention such as systematic phonics instruction.

Conclusion

Dr. Dave Edyburn's formula of balancing Reading Instruction (R) - Text To Speech (TTS) as noted in a previous segment of this publication is recommended because it:
Provides students with access to their regular grade level curriculum/materials, as mandated under IDEA 2004. Please review the sections in this publications (links below) calling on schools districts to comply with IDEA 2004 by providing students with IEPs with accessibility to their regular education grade level curriculum:

- ✓ School attorney and parent attorney, Mary Gerbig and Jeff Spitzer Resnick
- ✓ Dr. Thomas Hehir, former Director of U.S. Office of Special Education Programs (OSEP)
- ✓ Dr. Alexa Posny, former U.S. Assistant Secretary for Special Education and Rehabilitative Services
- ✓ Wisconsin DPI message to IEP team members

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When Text to Speech is not a Viable Option
Considerations for Students with Hearing Loss

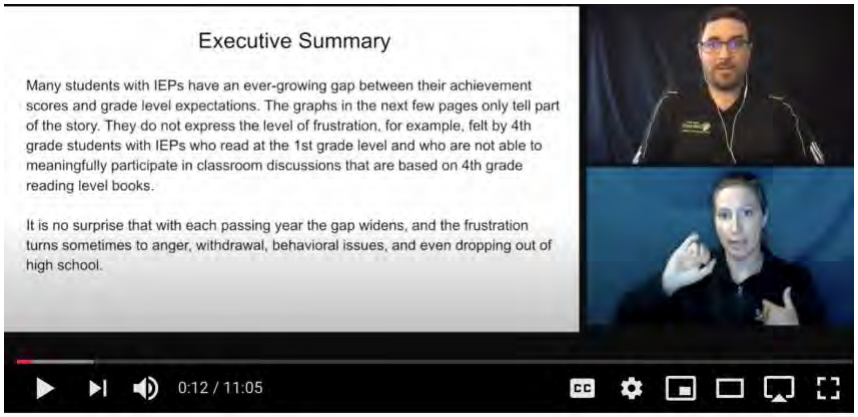
Contributed by Heidi Hollenberger, Diagnostic/Education Consultant and staff from the Wisconsin Educational Services Program for the Deaf and Hard of Hearing Outreach (WESP-DHH).

Students identified with hearing loss are at significant risk of falling behind their non-disabled peers in reading and math. Even children with mild to moderate hearing loss may fall one to four grade levels behind without help. (https://www.asha.org/public/hearing/Effects-of-Hearing-Loss-on-Development/) This is not the exception in Wisconsin. In 2018-2019 Wisconsin reported 720 students identified with hearing loss and needing special education services participated in the Wisconsin Forward Exam (https://wisedash.dpi.wi.gov/Dashboard/). Of those 720 students, 24.4% scored proficient or advanced in the area of English and Language Arts (ELA) as compared to students without IEPs who scored 46% proficient or advanced (https://dpi.wi.gov/assessment/forward). Students cannot learn and grow if they cannot access the material they are expected to be learning.-

Students with hearing loss who have access to spoken language, as determined by an Educational Audiologist, could benefit from the use of Accessible Instructional Media. Audio-files in combination with the printed material(s) would be comparable to the use and benefits of Closed Captioning.

Students who are deaf, who either do not benefit from or choose not to use amplification, generally do not have access to meaningful auditory information. Text to Speech (TTS) is not a viable option for these students. Many of these students use American Sign Language to communicate and learn. American Sign Language is not an English based language. It is a complex visual-spatial language that shares no grammatical similarities to English (http://www.deaflibrary.org/asl.html). In the United States closed captioning is

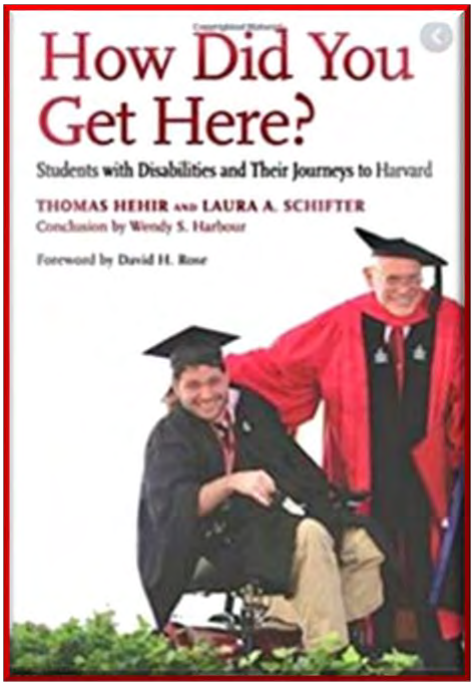
generally presented in grammatical English form as it is the print version of spoken English. Students who are deaf cannot rely on the same reading strategies as their hearing peers, such as sounding out words for example. Deaf students benefit from a signed interpretation of the printed text. This presents the printed material in visual form in the first language of the deaf learner. Currently, there are no visual files available through National Instructional Materials Accessibility Standard Version 1.0 (NIMAS). NIMAS along with the National File Format Technical Panel unanimously agreed that the adoption of NIMAS would significantly enhance the opportunity of students with disabilities to access, participate, and progress in the general education curriculum (https://aem.cast.org/creating/national-instructional-materials-accessibility-standard-nimas.html). Without access to print via visual means (i.e., American Sign Language), print access will continue to be inaccessible to a broadband of students. Inequitable access practices perpetuate the achievement gap between deaf learners and their hearing peers. Due to this inequity, individual school districts should consider providing visual files on demand for students who demonstrate print disabilities such as they are defined in this WCASS Guide.



Click on the ASL sign below to view the three sections in the WCASS Guide Simultaneously in ASL and Text To Speech

Ableism – Society's Pervasive Negative Attitude about Disability

In an article about Confronting Ableism[26], and in his important book, "**How Did You Get Here**", Dr. Thomas Hehir writes about the negative cultural attitudes toward disability that can undermine opportunities for all students to participate fully in school and society.



Dr. Hehir emphasizes that society's pervasive negative attitude about disability—which he terms ableism—often makes the world unwelcoming and inaccessible for people with disabilities. **An ableist perspective asserts that it is preferable for a child to read print rather than Braille, walk rather than use a wheelchair, spell independently rather than use a spell-checker, read written text rather than listen to a book on tape, and hang out with nondisabled kids rather than with other disabled kids**.

In education, considerable evidence shows that unquestioned ableist assumptions are harming disabled students and contributing to unequal outcomes (see Allington & McGill-Franzen, 1989; Lyon et al., 2001). School time devoted to activities that focus on changing disability may take away from the time needed to learn academic material. In addition, **academic deficits may be exacerbated by the ingrained prejudice against performing activities in "different" ways that might be more efficient for disabled people - such as reading Braille, using sign language, or using text-to-speech software to read.**

[26] http://www.ascd.org/publications/educational-leadership/feb07/vol64/num05/Confronting-Ableism.aspx

Because students identified as having learning disabilities are such a large and growing portion of the school population, we might expect that these students would be less likely to be subjected to ableist practices. The available evidence, however, contradicts this assumption. Many students with dyslexia and other specific learning disabilities receive inappropriate instruction which exacerbates their disabilities. For example, instead of making taped books available to these students, many schools require those taught in regular classrooms to handle grade-level or higher text. Other schools do not allow students to use computers when taking exams, thus greatly diminishing some students' ability to produce acceptable written work.

The late disabilities advocate Ed Roberts had polio as a child, which left him dependent on an iron lung. He attended school from home in the 1960s with the assistance of a telephone link. When it was time for graduation, however, the school board planned to deny him a diploma because he had failed to meet the physical education requirement. His parents protested, and Ed eventually graduated (Shapiro, 1994)

We can hardly imagine this scenario happening today, noted Dr. Hehir, given disability law and improved societal attitudes. Yet similar ableist assumptions are at work when schools routinely require students with learning disabilities to read print at grade level to gain access to the curriculum or to meet proficiency levels on high-stakes assessments. Assuming that there is only one “right” way to learn—or to walk, talk, paint, read, and write—is the root of fundamental inequities (emphasized).

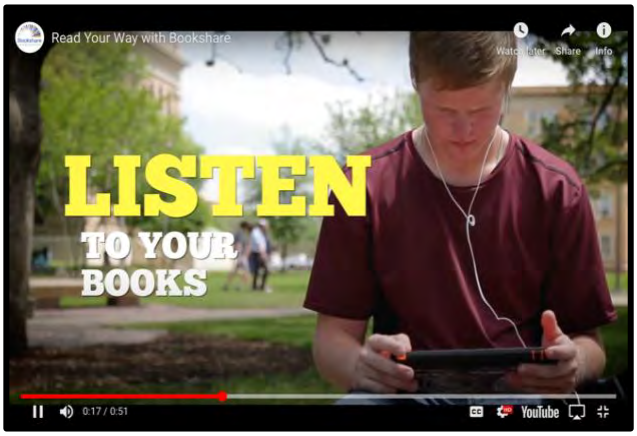
Accessible Media Producers (AMPs)

Bookshare Materials

- **What is Bookshare?**

  Bookshare is an e-book library that makes reading easier. People with reading barriers like dyslexia, blindness, and physical disabilities can read in ways that work for them when provided with access to a huge collection of titles in audio, audio + highlighted text, Braille, and other formats.

  Around the world, people with reading barriers use Bookshare for school, work, and the joy of reading. Membership is free for qualified U.S. students and schools, thanks to funding from the U.S. Department of Education, Office of Special Education Programs (OSEP). Bookshare is an initiative of Benetech, a nonprofit that empowers communities with software for social good.



Click on the image above: "Listen to Your Books"

- **Who qualifies to receive materials from Bookshare?**

  If a student finds it difficult to process or comprehend words, see text in books or on a screen, or physically manage books or reading devices, Bookshare may be able to help. For a student to join Bookshare, an expert, or Qualifying Professional (for example a Learning Disability teacher, School Psychologist, Speech and Language Pathologist, a teacher of the Visually Impaired, etc.), must confirm that the student has a qualifying condition that significantly interferes with his or her ability to read or process printed text. Following are some indicators that a student might have a qualifying condition:

- **Specific Learning Disability (SLD) that affects reading:** a disorder in the basic psychological processes involved in understanding or using written language, which manifests itself in the imperfect ability to read. Dyslexia is one example. Students in this category often have SLD on their Individualized Education Plans (IEPs) and/or have a diagnosed learning disability.
- **Need for Reading Accommodations:** the student struggles with reading and does not respond to instructional interventions to improve reading. Students in this category are sometimes served under Section 504 of the Rehabilitation Act of 1973.
- **Blindness or Visual Impairment,** including low vision.
- **Physical Disability:** A disability that hinders the student's ability to hold a book, turn pages, move his or her head, or otherwise physically manage the activity of reading a book.

Click on the image above: Describing what is Bookshare

Please use the two links below to view videos on using Bookshare in the Classroom:

Video: How to Read Bookshare books with Video Dream Reader

Video: Bookshare and Accessible Digital Text for Dyslexia

How to join Bookshare?

This step-by-step guide explains how a school can sign up for an organizational account, add students and other teachers to the account, assign books, and show students how to access and read books. Once a student is on a school account, he or she can upgrade to a full individual membership, which will allow the student to access books independently.

Email: membership@bookshare.org **OR** Bookshare
ATTN: Membership
480 California Avenue,
Suite 201
Palo Alto, CA 94306

Help Center: https://www.bookshare.org/cms/help-center/search/topic/sign

Have more questions?

Ask the Community **Email Bookshare** OR **Call Us** 650-352-0198

Hours: M-F 9-5 Pacific Time

Dolphin Easy Reader App for Bookshare Materials

Easy Reader is a FREE accessible reading app for readers with dyslexia, low vision or blindness. Browse and download from the World's largest collection of talking book and newspaper libraries, including Bookshare. Or copy text from anywhere on your phone to hear Easy Reader read it back to you. Experience perfectly synchronized text & audio. Or for text only titles, Easy Reader can add a human sounding voice of your choice. Boost comfort or contrast by choosing colors, text size and highlights to suit your visual needs.

Click on the image above: A better way to read Bookshare

Make your books' text as big as your eyes require. Unlike other mainstream reading apps, there's no restriction with Easy Reader. Zoom in with a standard 2-finger pinch or make fine adjustments with the simple sliders. There's never any blurry text or fuzzy fonts - your books' words are always crystal clear and always easy on the eye. Navigate your books or newspapers by skipping directly to specific pages or headings. Search your book for words or phrases. Add text bookmarks or record your own audio bookmarks to be able to return to them with ease.

Download Dolphin EasyReader

Learning Ally Materials

Learning Ally is a leading nonprofit education solutions organization dedicated to equipping educators with proven solutions that help new and struggling learners reach their potential.

Learning Ally range of literacy-focused offerings for students in Pre-K to 12th grade and catalog of professional learning allows us to support more than 700,000 students and 135,000 educators across the US. The Learning Ally Audiobook Solution is the cornerstone award-winning reading accommodation used in approximately 19,000 schools to help students with reading deficits succeed. It is composed of high quality, human-read audiobooks, and a suite of teacher resources to monitor and support student progress.

Terrie Noland, Vice President of Educator Initiative

The result of a meta-analysis, conducted to determine the effects of read aloud and Text To Speech tools on reading comprehension of students with reading disabilities, showed a significant effect size of .35 and is consistent with a previous meta-analysis on read-aloud accommodations for students with disabilities. In addition, this study suggests that human-read audio has a 50% greater effect on student comprehension versus synthetically narrated audio. *Does Use of Text-to-Speech and Related Read-Aloud Tools Improve Reading Comprehension for Students with Reading Disabilities?* A Meta-Analysis. Journal of Learning Disabilities[27]

Learning Ally is the only provider of all human-read audiobook content that meets the needs of students with textbooks, titles aligned to English Language Arts (ELA) curriculum and books that students want to read. Learning Ally intently focuses on matching

[27] https://pubmed.ncbi.nlm.nih.gov/28112580/

characters in books to the tone and texture of the human narrators that evokes emotion and brings characters to life in an authentic way. The human narrator also models oral reading fluency and provides clarity of words through accurate word decoding.

Five Ways Learning Ally's Human- Read Audiobooks Benefit Struggling Readers

Authored by Terrie Noland, Learning Ally Vice President of Educator Initiative

When students read below grade level, they lose ground rapidly. And once they fall behind, it's difficult for them to catch up. Providing access to human-read audiobooks supports reading skill development and levels the playing field for struggling readers. Here are five reasons why Learning Ally's human-read audiobooks are a game-changer that helps transform students into page-turners.

1. **The human voice carries meaning.**

   One of the most outstanding instruments that a human has is our voice. Voices carry meaning through tone, intonation, and timbre. If you said the statement, "That was a great game!" with enthusiasm and excitement, the meaning would come through that it really was a great game. However, if you emphasized that sentence with a different tone by emphasizing different words, it could convey sarcasm. This attribute of the human voice cannot be replicated through computerized and synthetic speech.

2. **The human voice models oral reading fluency.**

   Students who struggle with phonics and phonemic awareness also struggle with fluency- the accuracy, automaticity, and rate of reading. With Learning Ally's human-read audiobooks, a student is exposed to a multi-sensory approach to reading by hearing the skilled reader's voice and seeing words simultaneously on the device's screen. This fluent model of reading can provide the scaffolding that a struggling reader needs and that cannot always be provided by an educator or adult.

3. **Human readers pronounce words correctly.**

   Struggling readers usually have deficits and gaps in their vocabulary development. Learning Ally's nation of volunteer readers are trained to understand the correct pronunciation of words and adhere to strict guidelines when reading books. This same attention to vocabulary pronunciation cannot be replicated through computerized speech. Textbook readers have specializations in the field in which they read. For example, science textbooks with scientific jargon and vocabulary are read by science professionals and experts. This attention to pronunciation provides clarity and distinction of words for the listener.

4. **Human readers help to make connections.**

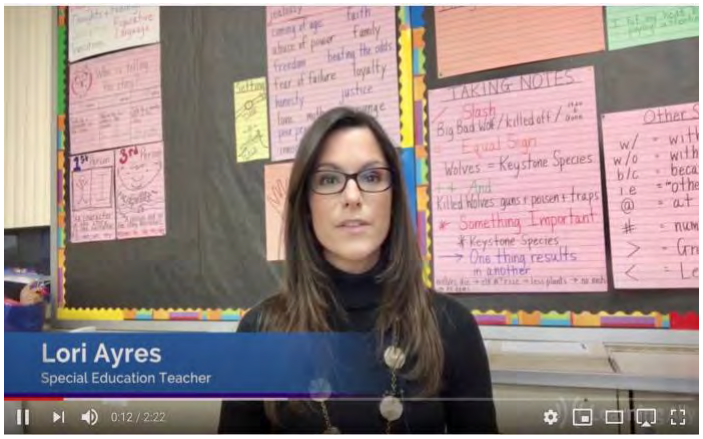
   Struggling readers usually aren't your avid readers when they have to decode words. Many struggling readers even consider themselves non-readers and have not made connections with books or developed a love of reading. When a human reads audiobooks, a natural connection can be made, just like climbing into the lap of a loved one. The synergy of the human voice creates emotion and connection and helps draw a student into a book or story, which helps develop and nurture the connection to reading.

5. **Human-read audiobooks bring characters to life and create equity.**

   Learning Ally has a hyper-focus on matching a reader's voice to the tone and texture of the book for authentic literature pieces. When reading "A Cinderella Tale from the Mexican Tradition," the student will hear a woman with a Mexican accent. Check out the Audio Preview. "The Call of the Wild" is read by a man with a deep, strong voice to emulate the strong character of Buck. Check out the Audio Preview. A young struggling reader of Mexican-American heritage used the Learning Ally audiobook solution to read "Esperanza Rising," she told her mom, "She sounds like me!" when referring to the reader. Through the authenticity of the human voice, this student was able to see herself in the book, which made her excited and energized to read.

- Case Study: Closing the Achievement and Access Gaps with the Learning Ally Audiobook Solution at Lake Tahoe
- This audio sample of authentic narration of Islandborn by Junot Diaz, showcases how human-read audiobooks can make a story come alive for children.

Eligible students are those who have a reading deficit or disability are blind or visually impaired or have a physical impairment. Check out the Learning Ally Eligibility Guide to learn more about each of these categories. **Learning Ally does not access files out of the NIMAC and therefore an IEP or 504 is not required for student eligibility.**



Click on the image above: Special Education Teacher talking about Learning Ally Support

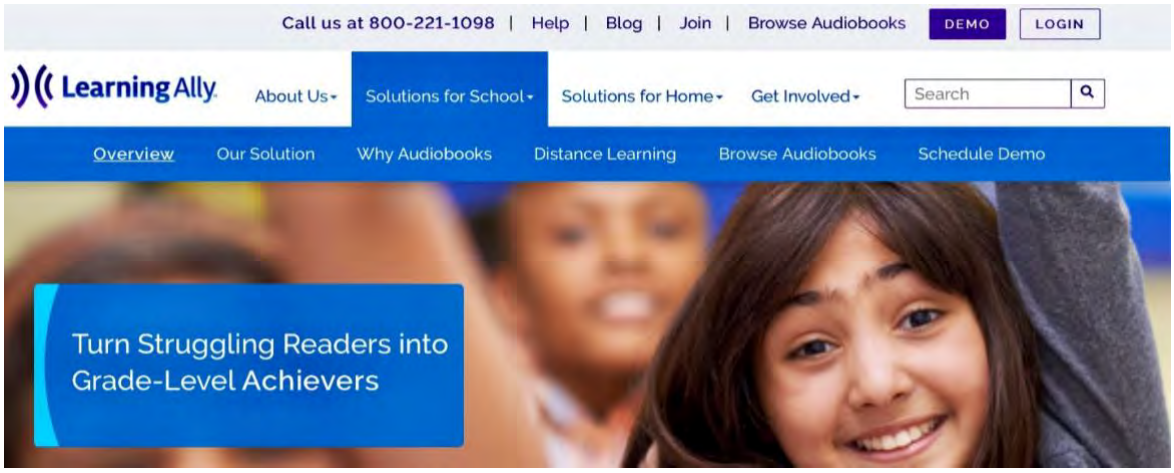
Educators have access to an online student management system that allows for easy monitoring of student progress. Students have full access to the human-read audiobook library, which features over 80,000 titles that match school curriculums for what students need to read as well as best-selling titles that students want to read. Students can self-select titles or select from a curated list of featured titles. This feature has allowed the Learning Ally data sciences team to discover that students are six times more likely to read when they select their own titles.

Students have enhanced learning outcomes with integrated tools, which include dictionary look-up, vocabulary list builder, embedded notetaking, page navigation, speed control and push notifications for motivation.

Click on the image above: Classroom Strategies

Relaxing with Learning Ally Audiobook

How to Access Learning Ally



Call 800-221-1098 to Access Learning Ally

Securing the Learning Ally Audiobook for your school or district.

1. Call to speak with a Manager of Education Partnerships at 800-221-1098
2. Request more information by filling out the online form, a representative will contact you.
3. Request a virtual demo to be scheduled at your convenience.

Request Pricing and Get Started

1. Contact Jessica Austin or Scott Burns, at 800-221-1098 for pricing information. A variety of purchasing options are available including district-wide implementation with launch support as well as single school implementations.
2. Consider adding professional learning support for your educators. Select from 9 courses including Integrating Audiobooks into the Classroom, and more.
3. Send PO to order *The Learning Ally Audiobook Solution*, per instructions on the estimate.
4. The Learning Ally Registrar will process the sales order, create an account in the Educator Portal for your Master Admin, and send an email with login information. Make sure accurate information has been provided for the Master Admin including the address for this important launch email to be received.

How to Integrate the Learning Ally Audiobook Solution in the Classroom

1. Your Learning Ally Educator Success partner will reach out to ensure system requirements, technical readiness, and review easy implementation steps as outlined online.
2. Make Learning Ally's Rapid Launch videos available for Administrators, Educators and Families.
3. Review the Audiobook Strategies Guide to learn more about how to integrate into the classroom. Integration can happen during independent reading, small group or whole group instruction.

Students utilizing the Learning Ally app during small group instruction

Return to Table of Contents

Text To Speech and Audiobooks for Classroom Instruction Use

This chapter includes descriptions of the 'Speech' feature embedded in different Operating Systems as well as multiple Text To Speech (TTS) applications and audiobooks as well as information on how to use them in the classroom.

Mac Operating Systems 'Speech" Feature

(From the National AEM Center website)

The Mac computer has a built-in Text To Speech (TTS) option. This feature is activated with a simple keyboard shortcut once it has been set up in System Preferences (under Accessibility, Speech). Pressing the default shortcut of Option and Escape on the keyboard will read the selected text with any of the system voices.

Video: Mac Operating System Use of 'Speech'

For learners who require more customizable TTS support, Wrise is a commercial word processing software that has a reading view where you can listen to text with word or sentence highlighting. A unique feature of Wrise is the ability to "tag" text so that it can be spoken by different voices and with different pitch, etc. This makes it possible to create a kind of re-enactment of the text using TTS to simulate dialogue (it is also helpful for multilingual texts). It costs $29.99.

Download the Wrise Application

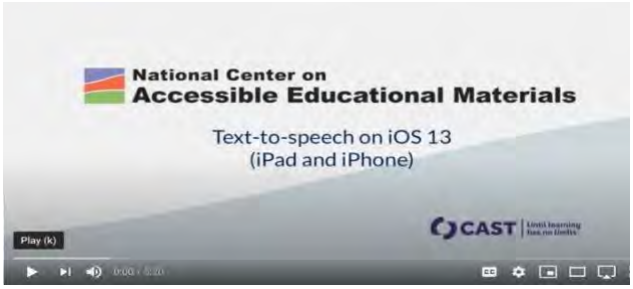
Wrise TTS allows students to listen to webpages and also have various documents read aloud by computer voices. The words are highlighted as they are read aloud, making it easier for the students to follow along. They can change the voice, speed and volume of the text as it is read aloud.

iPhone and iPad Operating System's 'Speech' Feature

(From the AEM Center website)

There are three built-in options for TTS on iOS devices such as the iPad: Speak Selection, Speak Screen and Typing Feedback. These options can be used to read the content aloud in webpages and other documents as long as they contain text that can be recognized by the TTS. The iOS TTS features are found in Settings under General > Accessibility > Speech.

- **Speak Selection** speaks the selected text in email, webpages and any document where the text can be selected. This feature requires a few steps:
  - Turn it on: go to General, then Accessibility, and then Speech in Settings and tap the On/Off switch for Speak Selection. Use the slider to adjust the speaking rate (a third of the way in seems to work well for most people who are just getting started with listening to a TTS voice).
  - Select text (this will depend on the app, but in Safari you can tap, hold and let go, then use the blue handles to make a selection).
  - Choose Speak from the popover menu.
- **Speak Screen** (iOS 8 and later) is similar to Speak Selection but does not require the user to make a selection first. Performing a special gesture (swiping down with two fingers from the top of the screen) will start speaking everything that is on the display (including buttons and other interface elements). Speak Screen should really be called "continuous reading" mode, because in addition to hearing the content read aloud, it can also flip the pages in an e-book or scroll to the next screen on a long web page. You can also use Siri to activate Speak Screen. Just say "Speak Screen" and the device should start reading the current screen aloud.



Click on the image above: Text To Speech on iOS 13

- **Typing Feedback** (iOS 10 and later): this option will provide spoken feedback as you type individual words or characters. One of the settings also lets you hover over the word prediction suggestions to make sure you have selected the desired option.
  Since iOS 6, both Speak Selection and Speak Screen can do word highlighting as the selected text is spoken aloud. This option is found in Settings under Accessibility, Spoken Content, and Highlight Content. You can choose to highlight by word, sentence or both. You can also choose an underline color and a background color for the highlighting.

  Most iOS devices also support the same advanced Alex voice that has been available on the Mac, providing even higher quality TTS support. Alex is unique in that it actually reads ahead in the background to pick up contextual clues that help it figure out how to pronounce words that typically trip TTS. Alex also can take a breath every once in a while, just like we do in conversation (and it even has different breaths depending on the word to follow each pause). For those times when even Alex struggles with pronunciation (proper names, brand names, etc.), iOS provides a pronunciation editor.

  Some learners may need even more customization than is possible with built-in TTS. At that point, it may be necessary to explore a third-party app. In addition to Voice Dream Reader, the free Dolphin Easy Reader app provides many options for customizing the display of the content and includes built-in TTS (with support for the purchase of additional high-quality voices). Dolphin Easy Reader can also download books from the Bookshare service for qualifying students.

  Sometimes the content students need to read is only available in a print version. To make it more accessible, the free Office Lens app from Microsoft (also available for Android) makes it possible to scan a document and convert it into a digital version that can be read aloud with TTS. Office Lens includes Microsoft's Immersive Reader, which in addition to the TYTS also includes a number of reading supports: color overlays, focus mode, highlighting the parts of speech and more.

Windows 10's Narrator to Read Your Screen Aloud

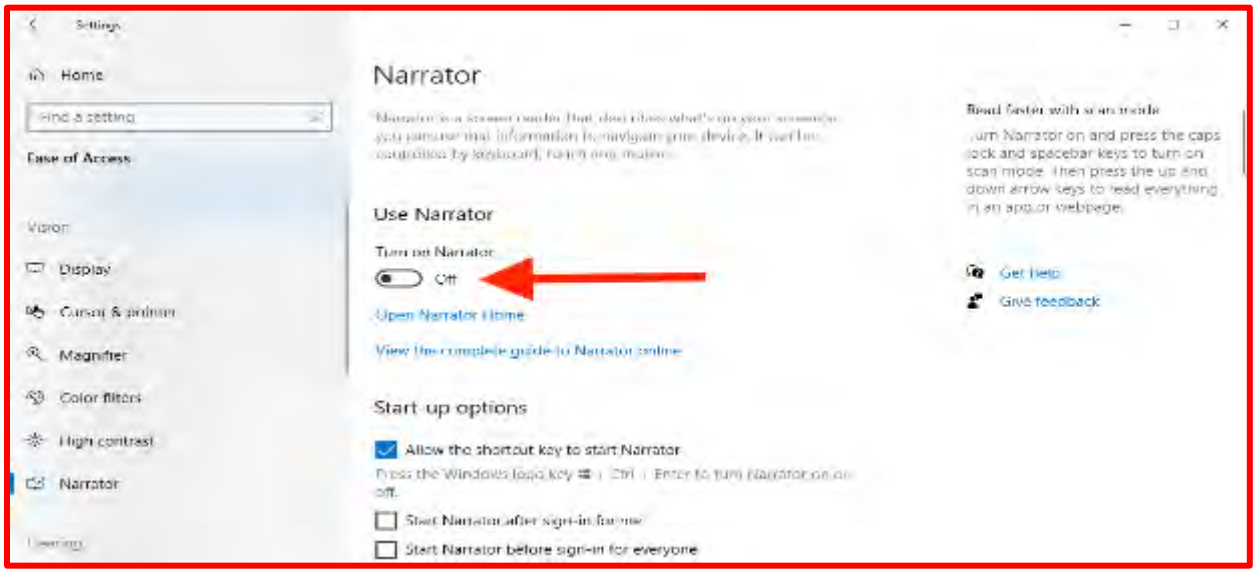
(From PC Magazine)

How to use Windows 10's Narrator as a Text-To-Speech and Screen Reader

Windows has long offered a screen reader and TTS feature called Narrator. This tool can read webpages, text documents, and other files aloud, as well as speak every action you take in Windows. Narrator is specifically designed for the visually impaired, but it can be used by anyone. Let's see how it works in Windows 10.

Turn on Narrator

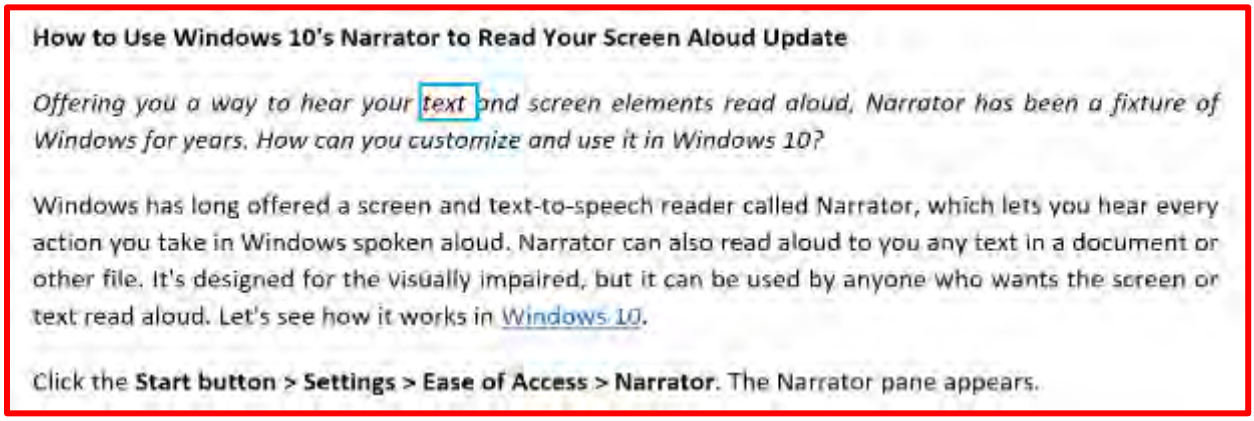
To use Narrator, click the Start button and open Settings > Ease of Access > Narrator to view the Narrator pane. Click the Turn on Narrator button to "On". A message may appear explaining how the Narrator keyboard layout has been updated more closely to match your experience with other screen readers.



Click "ok" to dispense with this message. Check the box next to "Don't show again" if you don't want to see this message each time Narrator starts.

How to Use Narrator

Now, if you want to use Narrator as a helpful TTS reader, you are ready to go. You just have to turn on the functionality when inside a webpage, document, or file. Move your cursor to the area of text you want Narrator to start reading. Press “Caps Lock” + “R” and Narrator starts reading the text on the page to you. Stop Narrator from speaking by pressing the **Ctrl** key.



How to Use Windows 10's Narrator to Read Your Screen Aloud Update

Offering you a way to hear your text and screen elements read aloud, Narrator has been a fixture of Windows for years. How can you customize and use it in Windows 10?

Windows has long offered a screen and text-to-speech reader called Narrator, which lets you hear every action you take in Windows spoken aloud. Narrator can also read aloud to you any text in a document or other file. It's designed for the visually impaired, but it can be used by anyone who wants the screen or text read aloud. Let's see how it works in Windows 10.

Click the **Start button > Settings > Ease of Access > Narrator**. The Narrator pane appears.

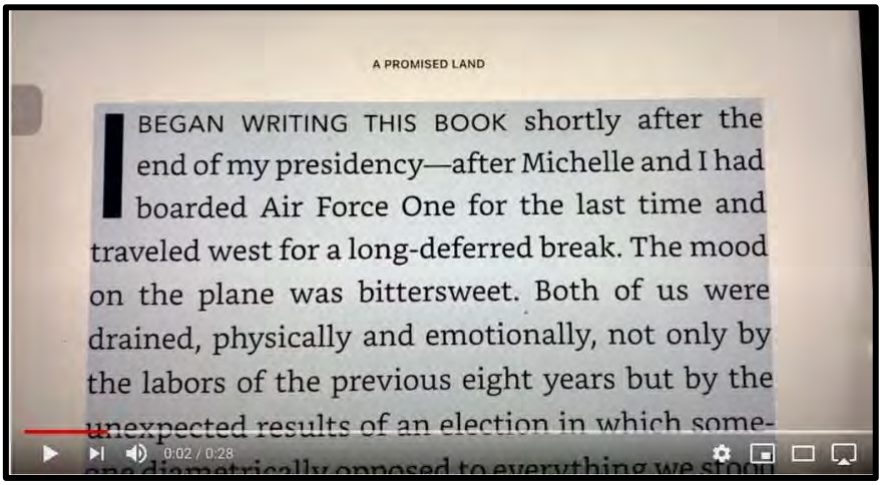
Listen to Kindle Books on your iPhone or iPad

How to Enable Text To Speech on iPhone or iPad in order to listen to Kindle books:

1. Start the iPhone or iPad's Settings app and then tap "Accessibility".
2. Tap "Spoken Content"
3. On the Spoken Content page, tap "Speak Screen".
4. Now that Speak Screen is enabled, start the Kindle app and open a book to the page you want to read.

Click on the image above

5. Using two fingers, swipe downward from the top of the screen.
6. Then the Speak Screen control should appear, and the Kindle page should start to be read aloud.



Click on the image above and the book on the right.

This video was obtained by following the instructions above.

Claro Read Application

Download Claro Read

Using the TTS option, students can listen to webpages and various documents read aloud by computer voices. The words are highlighted as they are read aloud, making it easier for kids to follow along.

Using the Optical Character Recognition (OCR) option, students can scan and read unlimited image files.

Using screen masking, the software can also mask or hide parts of the screen while kids are reading, to reduce distraction.

The talking dictionary can read aloud definitions for better comprehension.

With the pronunciation dictionary, if the TTS is mispronouncing a word, you can type in the word phonetically. From then on the TTS will pronounce it correctly.

Snap&Read Application

Snap&Read™ for Google Chrome, Microsoft Edge, and iOS

Snap&Read is
FREE for Educators

Snap&Read is a toolkit of purposeful reading tools and accessibility features that integrate with Google Chrome, Microsoft Edge, and iOS.

Click on the image above: 5th grade teacher describes the use of the Snap & Read application in the Classroom

Snap&Read features include:

- Read Aloud / Text To Speech with premium voices
- Screenshot Reader makes inaccessible text accessible with a click
- PDF Toolkit including annotation, accessibility, and Google Classroom integration
- Study Tools (highlighter, notes, dynamic reading outline)
- Dynamic Text Leveling levels vocabulary
- Color Overlay / Reading Line Guides bring focus to text by masking the reading area
- Picture-supported Dictionary include clear definitions and multiple icon representations
- Biographer cites sources automatically
- Readability Analyzer shows the grade level equivalent of text on any webpage
- Remove Distractions on webpages
- Reading and Writing Outlines (KWL, SQ3R, Compare/Contrast, CRISS strategies, etc.)
- Translation (100+ languages)
- Data for educators shows how much students are reading and the readability of what they read

Learn more at: http://donjohnston.com/snap-read

Click on the image above: Snap and Read | CoWriter

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Kami, a Google Extension

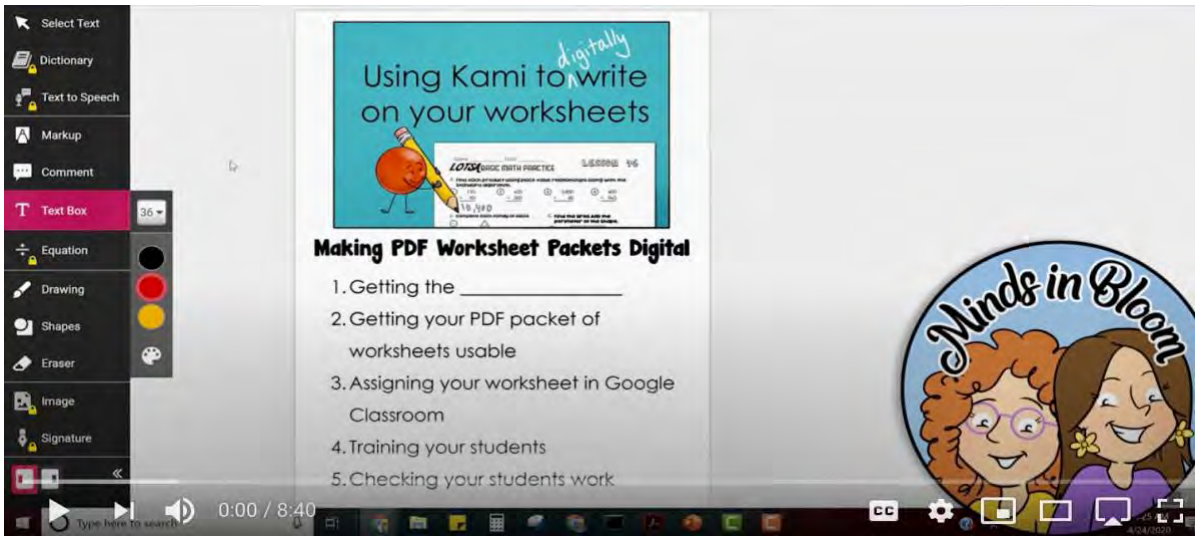
Download Kami Extension through Google Chrome

What is Kami?

Kami is a digital classroom app built to transform any existing document into an interactive learning experience. It contains Text to Speech (TTS) (see video below), and it can also be used with Google Classroom (see video on next page). Kami is a PDF and document annotation app used in schools.

Video: What is Kami?

Video: Improvements in Kami Text To Speech Features



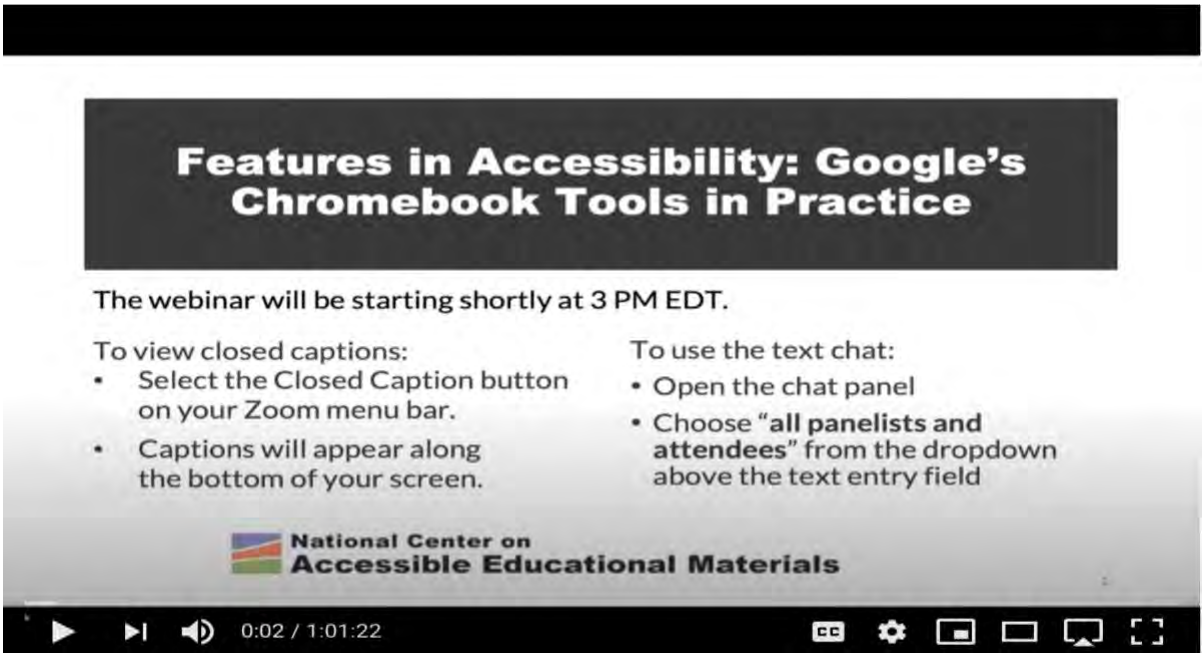
Click on the image above: on how to use a free version of the Kami extension with Google

Read & Write for Google Chrome

Download Read & Write for Google Chrome

The Read & Write application is free for teachers under the Texthelp Company
(See Texthelp section on page XX)

Students can listen to webpages and various documents read aloud by computer voices. The words are highlighted as they are read aloud, making it easier for kids to follow along. They can choose from several natural-sounding voices. With the Optical Character Recognition (OCR) option, students can scan and read unlimited image files. With the highlighting and outlining option, students can highlight text and then collect the highlights.



Click on the image above: Webinar by the National AEM Center Staff on Accessibility: Google Chromebook Tools in Practice

Text To Speech for Google Chrome

Download Text-To-Speech for Google Chrome

As an extension on Google Chrome, you can highlight text on a webpage and listen to it. There are over 10+ accents and voices to choose from as well.

This software also supports many languages, and it is FREE of charge and easy to use.

You can configure the voice and speed options by changing the settings on the options page.

Read Aloud: A Text to Speech Voice Reader

Read Aloud is an extension available on Google Chrome and Firefox that uses Text To Speech (TTS") technology to convert webpage text to audio. It works on a variety of websites, including news sites, blogs, fan fiction, publications, textbooks, school and class websites, online universities and course materials.

Read Aloud is aimed at users who prefer to listen to content instead of reading, people with dyslexia or other learning disabilities, children learning to read, or simply to provide users with an alternative way to consume web content.

Read Aloud allows you to select from a variety of TTS voices, including those provided natively by the browser, as well as by TTS cloud service providers such as Google Wavenet, Amazon Polly, IBM Watson, and Microsoft. Some of the cloud-based voices may require additional in-app purchases to be enabled.

Text To Speech (TTS) by the Hewizo Company

Download Text-To-Speech by the Hewizo Company

Text To Speech (TTS) extension by the Hewizo Company, reads articles aloud in 30+ languages using state of the art artificial intelligence. Hewizo is not only a text to speech (TTS) application, the extension offers multiple productivity features like, cleaning ads, saving articles for later use and aggregating top news from around the world.

The Features include:

- Text to speech (TTS) article reader
- Listen to articles using a natural reader to produce the most human sounding voice in over 30+ languages
- Aggregates news from major publications and converts them to audio
- Text To Speech (TTS) feature that converts article URLs to audio
- Conveniently opens/saves web articles on hewizo.com from our chrome extension
- Syncs progress across multiple devices - Start reading on your laptop, continue where you left off on your smartphone
- Allows personal customization - Only see news you care about
- Offers a clean reader view by removing ads from webpages so you can enjoy your articles distraction free
- Save your favorite articles and enjoy them right from your pocket whenever you choose
- You can use Hewizo Text To Speech as a podcast for your articles collection

Helper Bird: Accessibility & Dyslexia Software

Download Helper Bird: Accessibility & Dyslexia Software

Helper bird is software that gives you the features to make websites more accessible and productive to your needs. Providing you features like dyslexia fonts, change the font & background color, text to speech with natural voices, overlays, dyslexia rulers, immersive reader, reader mode, and much more to tailor the web to your needs.

Click on the above image: for a description of the Helpbird Application

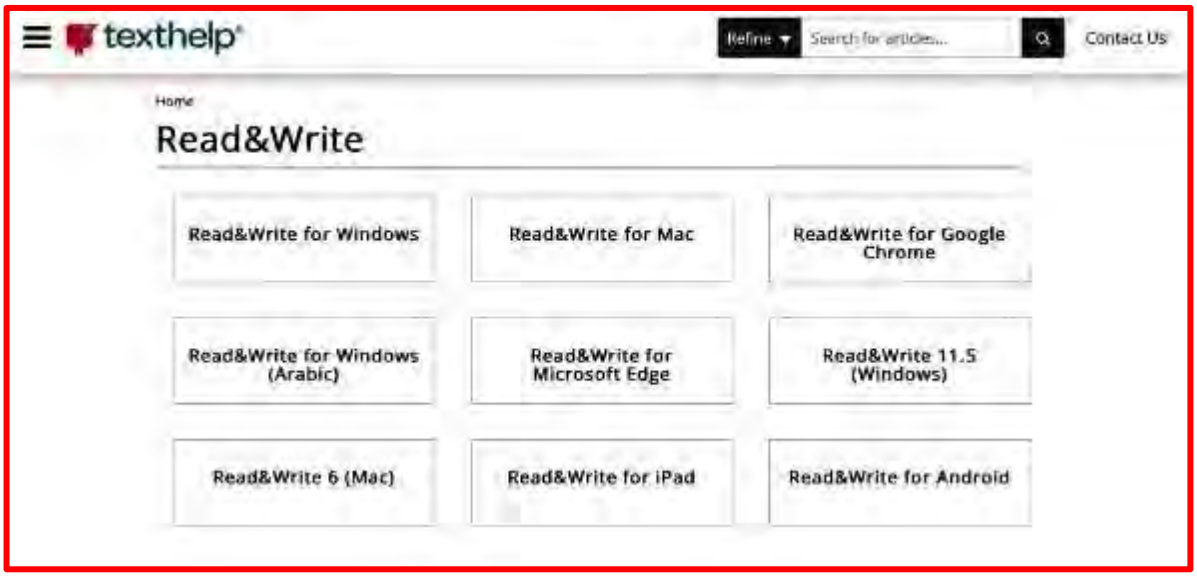
Application software includes:

- Change the font on the page to over 15 fonts.
- Dyslexia fonts, like OpenDyslexic, Lexa pro, Lexend, and 12 others.
- Reader Mode.
- Annotation software.
- Line Focus.
- Overlay to increase reading focus.
- Font sizes.

Full-screen mode, and many more. To see all the features and learn more, check out https://www.helperbird.com/features

Texthelp

The Texthelp Company includes the Read & Write software **(free for teachers)**. It provides support and solutions for schools, including Remote Learning as well as support for parents. Use this link to access the texthelp Company and scroll down to see their education solutions.



You can access the above downloadable links here

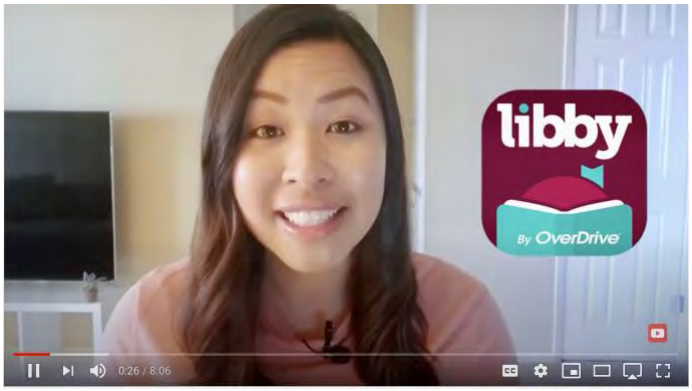
Texthelp Training Guide in using Read & Write

FREE Premium Subscription for Teachers

Libby by Overdrive

Libby is a free app where you can borrow ebooks and digital audiobooks from your public library. You can stream books with Wi-Fi or mobile data, or download them for offline use and read anytime, anywhere. All you need to get started is a library card. You'll need a library card for each library you want to borrow from. You can add multiple libraries to Libby, and you can even add multiple cards for each library.

If you don't have a card, you can learn about getting a card in this help article. The Libby app is free to install from your device's app store. All the digital content from your library is free to borrow with a valid library card. There are no subscription costs, no in-app purchases, and no late fees (books are automatically returned on their due dates).



Click on the image above: Accessing the Libby App

You can download the Libby app on your mobile phone iOS 9+ Apple App Store), and Android 5.0+ Google Play).

If you have a Windows computer, Mac computer, or a Chromebook, you can use Libby in your web browser at libbyapp.com. We suggest using the latest version of Chrome, Safari, Firefox, or Edge (Chromium).

Your library chooses which digital books they'd like to provide in Libby. They also set lending policies, like how long you can borrow books and how many you can borrow at a time. Libby is only for digital books. It doesn't include any physical materials from your library.

Voice Dream Reader

Voice Dream Reader is a most accessible reading tool. With advanced text-to-speech and a highly configurable screen layout, it can be tailored to suit every reading style from completely auditory to completely visual, plus synchronized combination of both.

Voice Dream Reader is Available for Download on the Apple Store for iPhone, iPad & iWatch

Voice Dream Reader supports reading PDF and Word documents, DRM-free EPUB and DAISY eBooks, Web pages and more. It's directly integrated with Bookshare, Dropbox, G-Drive, Evernote, Pocket, Instapaper, and Gutenberg.

It features:

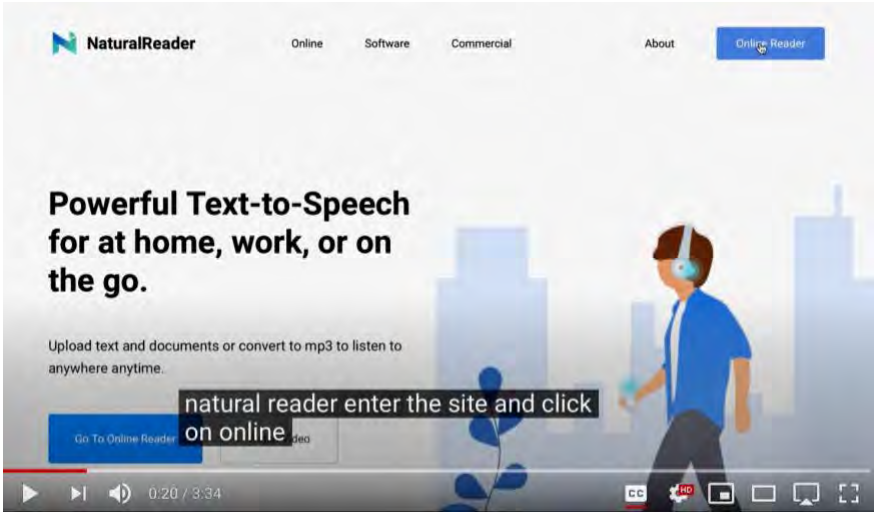
- Built-in voices, as well as in-app purchases of higher-quality voices
- Listen to documents like it's music, with play-pause button, gestures or remote control
- Synchronized word and line highlighting, font choices, customizable color themes
- Easy extraction of common file types, as well as full integration with Bookshare

Click on the image above

Natural Reader

(Described on the National AEM Center)

Download Natural Reader



Click on the image above: Instructions on Using Natural Reader

Users like Natural Reader because it's easy to use, has a "One-click" technology, and there is no difficulty in copying and pasting the text into other forms that TTS software requires. All you need to do is have Natural Reader select the text you'd like to read out loud and press one single hotkey.

Oddcast

Based in New York City, Oddcast is a Media and Technology company that develops conversational character products. The company's flagship product, Vhost, allows businesses to create brand-appropriate online characters that intelligently interact with customers on websites, including learning / educational systems.

Download Oddcast for Education

As you can see from the demo picture/video below, you simply paste text on the box on the left, and the software reads the text aloud, in real time and with accurate lip-synching. Special effects can also be applied to the audio, including emotive cues and expressions. This makes it easier for students with learning disabilities to have an opportunity in reading to follow the text

There are no programming skills required. Just type in the text bin what characters you would like to be read out loud. Users like this feature as it allows them to read their text.

Click on the image above: You can insert text in the box to the left and change the character by clicking on the dice

ReadSpeaker TTS Learning Tools

ReadSpeaker Overview:

ReadSpeaker is a global voice specialist providing natural-sounding Text To Speech solutions for K-12 and higher education institutions. The suite of TTS Learning Tools voice-enables any digital educational content including assessments, assignments, and lessons, and is designed to accommodate various learning styles while providing assistance for those with reading, learning, and language challenges. ReadSpeaker tools are certified for integration with all Learning Management Systems and are an accepted component of Universal Design for Learning (UDL). With more than 20 years of experience, ReadSpeaker is dedicated to providing pioneering, easy-to-use products that enhance the learning experience for educators, administrators, and students alike.

Click on the image above: ReadSpeaker Text to Speech

The ReadSpeaker Difference:

- SEAMLESS INTEGRATION ReadSpeaker TTS Learning Tools are supported natively within all Learning Management Systems.
- PROACTIVE SUPPORT FOR ASSESSMENTS ReadSpeaker TTS Learning Tools can be used to voice enable tests and quizzes directly within your Learning Management System, even when using proctoring tools like Respondus LockDown Browser.
- LIFELIKE PRONUNCIATION AND ENUNCIATION ReadSpeaker's natural sounding voices are available in a variety of voices and languages and are audibly tuned to speak clearly and with correct pronunciation.
- ON-DEMAND ACCESS Voice-enable any content from anywhere, at any time, from any device.
- DESIGNED FOR COLLABORATION ReadSpeaker TTS Learning Tools work to enhance collaboration between administrators, instructors, and students and are designed with each in mind.

What Teachers Have to Say about ReadSpeaker TTS:

"Text to Speech allowed us to support the needs of students who needed or learned best when text was read aloud…We knew this tool [ReadSpeaker] worked; we knew that is was reliable, and we knew that it was a single tool that could meet the needs of a variety of learners.

Joann Glen, 2020 NASSP "Digital Principal of the Year", Pasco eSchool

"We are always looking for ways to make life easier. The entire population of students and faculty can make use of these tools. ReadSpeaker is a plugin that just works with both our website and our Canvas installation. We didn't have to do anything extra to make it work."

Eric Turner, Assistant Director Web and Portal Services, MT. San Antonio College

Working with ReadSpeaker:

- To learn more about ReadSpeaker or to request an assessment for your institution, visit https://www.readspeaker.com/education/
- ReadSpeaker works with over 1,000 education institutions in 40 countries.
- ReadSpeaker has 20+ years of experience and excellence in customer service.
- ReadSpeaker's TTS Learning Tools qualify for assistive technology and accessibility support grants. Visit www.readspeaker.com/grants to learn more.

Storyline Online

Storyline Online is a children's literacy website created by the SAG-AFTRA Foundation, which provides free storytelling videos and resources for parents and teachers to foster a love of reading in children. Storyline Online®, streams videos featuring celebrated actors reading children's books alongside creatively produced illustrations. Readers include Oprah Winfrey, Chris Pine, Kristen Bell, Rita Moreno, Viola Davis, Jaime Camil, Kevin Costner, Lily Tomlin, Sarah Silverman, Betty White, Wanda Sykes and dozens more.

Access Storyline Online Here

Storyline Online receives over 100 million views annually from children all over the world.

Click on the Image above

Reading aloud to children has been shown to improve reading, writing and communication skills, logical thinking and concentration, and general academic aptitude, as well as inspire a lifelong love of reading. Teachers use Storyline Online in their classrooms, and doctors and nurses play Storyline Online in children's hospitals.

Storyline Online is available 24 hours a day for children, parents, caregivers and educators worldwide. Each book includes supplemental curriculum developed by a

credentialed elementary educator, aiming to strengthen comprehension and verbal and written skills for English-language learners.

Storyline Online is a program of the SAG-AFTRA Foundation. The Foundation is a nonprofit organization that relies entirely on gifts, grants and donations to fund Storyline Online and produce all of its videos.

Click on the Image above

Click on the Image above

Lit2Go

Download Lit2Go

Lit2Go provides free audiobook versions of books that are no longer protected by copyright laws. Lit2Go offers downloadable PDFs of books so the student can read along while listening to classics like *The Call of the Wild*.

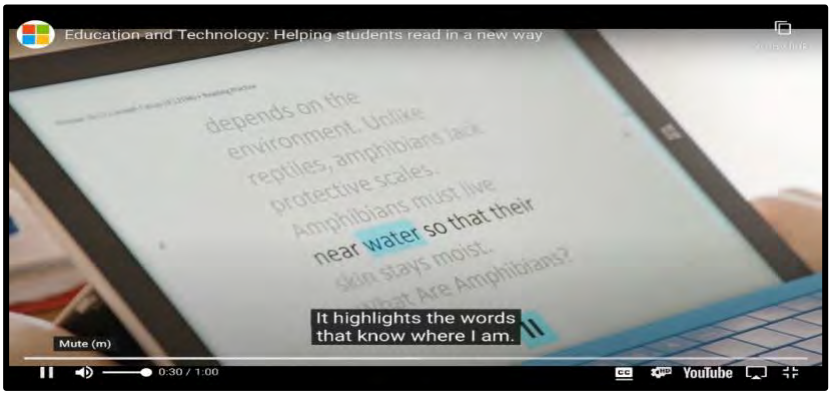
Other sites, like LibriVox, provide a similar service.

The site also categorizes books by reading level.

Immersive Reader (Microsoft Learning Tools)

Download Immersive Reader for multiple platforms here

With this software students can listen to text read aloud in several Microsoft applications. Words are highlighted as they're read aloud, making it easier for kids to follow along.



Click on the Image above

With the Optical Character Recognition (OCR) option students can convert images of text into electronic text and upload it to OneNote or Word. The screen masking option hides all but a few lines of the screen while reading, to reduce distraction.

With the display control, students control how documents are viewed. Spacing, fonts, and margins can all be customized. The color of the text and background can also be changed.

With the picture dictionary, students can click on a word within the Immersive Reader, they can hear the word read aloud and see a picture of what it means. This is in addition to the standard dictionary and thesaurus tools already in Microsoft Word.

With the grammar options, this software can divide words into syllables, which can help with decoding. Words can also be labeled according to parts of speech, like nouns, verbs, adjectives, and adverbs.

Clicker

What is Clicker?

Clicker is a child-friendly word processor that offers extensive scaffolding options to emergent, developing and struggling readers and writers. It provides support throughout the writing process, from planning, to writing, to proofing. With Clicker, children of all abilities can independently access the curriculum and make significant gains in their literacy skills. Clicker 8 is compatible with Windows/Mac computers. Clicker Writer is compatible with iPad/Chromebook devices.

Where and how to obtain these materials?

Clicker is purchased from Crick Software. Customers can buy Clicker through Crick Software's website, or by getting in contact via email at usinfo@cricksoft.com or phone at **203 221 2697**. After a customer has purchased Clicker, they are sent an email containing their access codes and installation instructions.

How to use these materials in the classroom?

Clicker provides extensive Text To Speech support. Each time a student completes a sentence, it is automatically read aloud in a clear, child-friendly voice, with each word highlighted as it is spoken. Those needing more support can choose to have each word or letter read aloud as it is entered. Users can also customize the pronunciation of unusual words and children's names with Clicker. In addition, all of Clicker's writing tools are speech supported, including the intelligent word predictor and spell checker, so students can check a word before they use it. Students also have access to speech feedback when using Clicker 8's mind map feature.

Clicker includes access to thousands of ready-made curriculum resources, including sentence building sets, word banks, writing frames and Clicker Books, all of which are speech supported. Clicker can be used in various classroom scenarios, including collaborative whole-class work on an interactive whiteboard, group assignments and independent literacy tasks.

DocsPlus

What is DocsPlus?

DocsPlus is a supportive word processor designed for struggling readers and writers in middle and high school. DocsPlus can also be used by students who qualify for additional access arrangements during exams. DocsPlus is compatible with Windows/Mac computers. The DocsPlus App is compatible with iPad/Chromebook devices.

After a customer has purchased DocsPlus, they are sent an email containing their access codes and installation instructions.

How to use these materials in the classroom (in plain language)?

DocsPlus provides extensive text-to-speech support. Each time a student completes a sentence, it is automatically read aloud in a clear, human-sounding voice, with each word highlighted as it is spoken. Those needing more support can choose to have each word or letter read aloud as it is entered. Users can also customize the pronunciation of unusual words and specialist curriculum vocabulary. In addition, all DocsPlus writing tools are speech supported, including the intelligent word predictor and spell checker, so students can check a word before they use it. Students also have access to speech feedback when using DocsPlus' mind map feature. DocsPlus includes access to hundreds of ready-made curriculum resources, including word banks, writing frames and mind maps, all of which are speech supported.

DocsPlus' speech feedback is especially useful for students with dyslexia, helping them to focus on what they want to write rather than having to think about each word individually. In addition, DocsPlus has an integrated 'DocReader' that will read aloud any PDF or Word document (such as worksheets), enabling students who struggle with reading to access the curriculum more independently.

Talking Word Processor

Download Talking Word Processor

Talking Word Processor for Google Chrome is an easy-to-use, full-featured word processor with Text To Speech capability. It includes text dictation, word prediction, content summarization, integrated dictionary and a variety of tools to assist in proofing your documents. Talking Word Processor for Google Chrome works with industry-standard word processing file formats. It is an invaluable tool for teaching word processing and for general literacy. You can use Talking Word Processor to write and organize documents easily and efficiently.

Talking Word Processor includes key features:

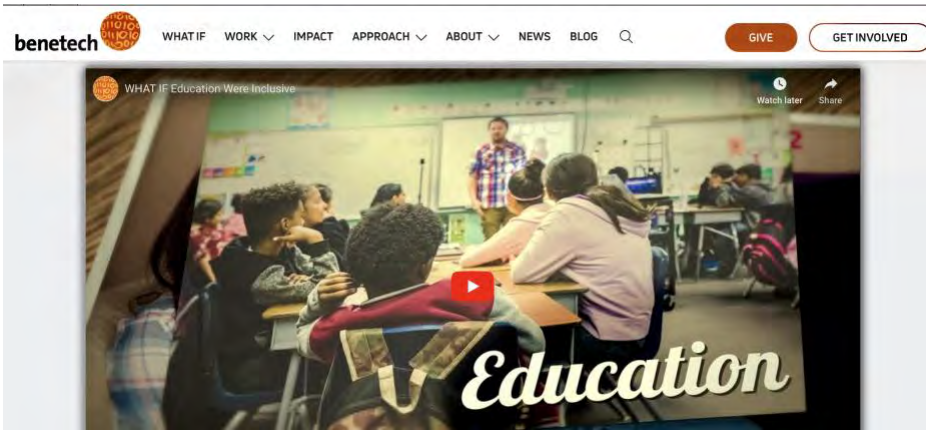
- Read any text aloud
- Dictate directly for composition assistance
- 250,000+ word Dictionary
- Word Prediction
- Summary and Writing Analysis

Born Accessible

Born Accessible is a Benetech company initiative supported by the U.S. Department of Education, Office of Special Education Programs (Cooperative Agreement #H327D170002).

Information from the Born Accessible website: https://bornaccessible.benetech.org.
The digital revolution and ongoing advances in technology have made it possible to get **more content, in more ways, to more people**. At the same time, they have also given publishers and content creators a new digital imperative: if content is "born digital," it can—and should—be "born accessible." **Accessible content must be a priority**.

This could truly be a golden age of access to books and information for people with print disabilities—such as people who are blind or are dyslexic. There are millions of readers that can't access a print book because of blindness or low vision, mobility impairments or learning disabilities such as dyslexia. For them, ebook technology promises a new world of opportunity for accessible content. In fact, for the first time in history, people with print disabilities may be able to purchase and fully utilize an entire world of newly published books, instantly upon publication.



Click on the Image above to find out about the Benetech Company's commitment to make information accessible

As the nonprofit tech company operating Bookshare, the largest library of accessible ebooks in the world, Benetech believes the time is right for the publishing world to seize this era of opportunity. We believe that all content born digital can—and should—be born

accessible. We understand how to navigate this new world of opportunity—both by identifying the possibilities and working to resolve the challenges.

Tremendous progress has been made when it comes to retrofitting books, especially those that are primarily text, but as digital content becomes richer and more complex, such as with STEM materials, the challenge of making it born accessible will require broader partnerships and technological innovation.

Accessibility Requirements

Global Certified Accessible (GCA) assesses titles for the full range of accessibility features currently detailed in the EPUB Accessibility 1.0 Specification (also known as the "Baseline") and Web Content Accessibility Guidelines 2.0 (WCAG 2.0) for levels A, AA, and AAA. Additional features specific to ebooks are also included. Benetech works with a publisher to extensively evaluate their production process for creating accessible books. Benetech certifies that the publisher has demonstrated their conformance to the accessible EPUB creation guidelines set forth by the Global Certified Accessible Consortium and which are based on standards put in place by the W3C and the international publishing community. While Benetech certification denotes confidence that the publisher has demonstrated its ability to regularly produce accessible books, any books that do not fully conform to the Global Accessible Certification standard remain the responsibility of the publisher.

OCR capabilities

Joy S. Zabala, EdD, director of technical assistance at CAST and the National Center on Accessible Educational Materials for Learning, wrote this article for the Understood website.

Optical character recognition (OCR) plays an important role in transforming printed materials into digital text files. These digital files can be very helpful to kids and adults who have trouble reading. That's because digital text can be used with software programs that support reading in a variety of ways.

OCR is built into the software of many programs and devices, including some computers, tablets, phones and printers. Many of these devices can automatically convert a scanned or photographed document into digital text.

Digital text is one of several formats that make printed information accessible to more people (other formats include audio, large print and Braille). Digital text is especially helpful for struggling readers, including those who have learning differences such as dyslexia. The digital format makes it possible for readers to see words on a screen and hear them read aloud at the same time. This provides more ways to engage with the information. It can also help kids develop independent reading skills.

What's the connection between something printed on paper, digital text and OCR? One way to convert printed material to digital material is by using a scanner. The scanner creates a photo of the printed material. This photo, often called an image, can be displayed on a device that has a screen.

But scanning is only the first step. The photo on its own won't enable software programs to highlight words or add other options that can assist your child with reading. This is where OCR comes in.

OCR “looks” at the photo (this is why its name begins with “optical”) and recognizes the shapes of the different letters, numbers and other characters. It uses character recognition to convert the photo of the document into a text file. In many cases, the digital version will maintain the “look and feel” of the original.

OCR makes it possible to make changes to the digital text. What can be done with the digital text depends on which reading software you’re using. Common options include:

- Highlighting words, sentences or paragraphs
- Speaking words aloud using Text To Speech
- Changing the colors and the size of text
- Placing digital “bookmarks” that enable users to move around within the text (such as moving directly from the Table of Contents to Chapter Four)

In essence, OCR lets you make changes to the scanned document and maneuver from place to place within it—just as you can with any text document on your computer.

Let’s say your child has a homework sheet that he/she’s struggling to read. You could scan and transform the homework sheet into digital text. You can learn how to do this by watching tutorials on YouTube. (Enter the term “optical character recognition” in the search box.) Once you convert the sheet into a digital file, your child can use the tools on the computer to assist with reading.

Screen Reader for Text To Speech

Authored by Tiffany Hacker, CESA 7 AEM Specialist

There are at least four different options for using a screen reader for text to speech. They include: NVDA, ChromeVox (Chromebook only), Voiceover (Mac/ iOS devices only), and JAWS. JAWS is the only program that is an added cost and the others are either built into the computer system or free. Generally, those with visual impairments use screen readers to assist with accessing computers and other mobile devices. Though we are finding that there are a variety of features that can be useful for those students who have a print disability.

A few features found to be useful include reading key commands, mouse echoing, and navigation shortcut keys. Reading commands may consist of reading the full page, a paragraph, sentence, or a single word. It also consists of commands to listen to the spelling of a given word. Mouse echoing is where the screen reader would read where the mouse is located. It may be as the mouse moves or with the use of a key command. Lastly, students can use navigation key commands to navigate a webpage more efficiently rather than visually reading to find a heading or section. You will also notice a few of the screen readers will have a “visual cursor” that will follow the screen where the screen reader is speaking. This can assist teachers and students better in using the screen reader. Also, the screen readers that are built into the system often have a “practice” feature which gives the user a time to learn to use the screen reader. Newer updates for screen readers are now including gestures for computers with touch screens. This would allow students to combine touch and key commands to access a variety of text.

If choosing to have a student use a screen reader for the added feature of text to speech and there is not a need for assistance in visually accessing the computer, it would be recommended to use the screen reader on a laptop (mac or pc), desktop (mac or pc), or Chromebook. This is because the student can continue to use the computer normally without the screen reader becoming a nuisance. It would not be recommended to use a screen reader if using a tablet (like the iPad) because there are other gestures needed to navigate the tablet when a screen reader is enabled and can become frustrating for a student if he/she did not have time to fully learn how to use the screen reader.

Return to Table of Contents

Premier Chrome Toolbar

Download Premier Chrome

The Premier Toolbar Extension is a convenient way to access all of the Premier Literacy Tools for Google Chrome. Using only a single login, you quickly have access any of Premier's Tools: One Click Reader, One Click Dictionary, One Click Summary, One Click Dictation, Worksheet Wizard, Talking Word Processor and Talking Pointer. With an easy-to-use license from Premier, you'll be able to use any of these tools on Chromebooks, PC's and Mac's from anywhere using the Chrome browser.

Talking Pointer: The popular Premier Talking Pointer is great for reading web content. It converts the mouse pointer into a reading tool - simply point and listen.

Talking Word Processor: The Talking Word Processor is a full-featured word processor that can handle a wide variety of documents, including PDF files. It includes word prediction, content summarization, built-in dictation, and an integrated dictionary.

One Click Reader: To have any text read aloud with highlighted tracking, simply select text from any webpage or document and click the Reader icon. Change the voice, the speaking rate, and other personalized reading features.

One Click Dictionary: Definitions at your fingertips!! Select any word from text you are viewing and click the Dictionary icon to get the definition and have it read aloud to you. You can even speak to the Dictionary and have it look up any word! The One Click Dictionary also combines the power of a Thesaurus and Interlink vocabulary for superior writing assistance.

One Click Summary: If you need to focus on the most important information in an article, Summary is the tool for you. Select any amount of text from a passage, click the Summary icon and paste it in. Set the Summary to any percentage, and within seconds

you can have the summarized version of the text read aloud to you. One Click Summary makes quick work of studying and research involving large amounts of information.

One Click Dictation: Why type when you can just talk? One Click Dictation lets you talk instead of type!!! In fact, there's no need to "train" it for your voice. With outstanding accuracy, One Click Dictation even handles different spellings for U.S. vs. Canada / U.K. English. You can proofread your dictated text aloud and copy it into any other application like email, word processing and online forums!

Worksheet Wizard: Worksheet Wizard is a great tool for working with any type of worksheets. Simply access PDF files from any source (including scanners or phone apps) and load them into the Worksheet Wizard. Flexible capabilities allow you to have text read aloud to you, edit text, copy and paste graphics, add annotations and save your changes directly to the PDF file. It even has the ability to dictate text, and includes robust word prediction.

Use of Additional Voices

Contributed by Professor Dave Edyburn, Senior Research Scientist and Professor Emeritus at the University of Wisconsin at Milwaukee.

Text To Speech (TTS) users are encouraged to explore the various voices offered within their technology operating system to find the voice that they find most agreeable. This is a form of personalization since there is no best single voice. Text To Speech users may discover that they need to use multiple voices because their preferred voice may not be available on all devices in all applications because of the programming tools that were used.

Apple

- Mac Voice Over Screen Reader
  https://www.apple.com/accessibility/mac/vision/

Chrome

- You can buy voices through Acapela to personalize the voice that reads text aloud to you on your Chromebook.
  https://www.acapela-group.com/
  https://support.google.com/chromebook/answer/9032490?hl=en

There are various web-based voice synthesizers that work with **any operating system:**

- AT&T Natural Voices
  https://nextup.com/attnv.html
- Free TTS
  https://freetts.sourceforge.io/
- Read Aloud (Firefox add-on)
  https://addons.mozilla.org/en-US/firefox/addon/read-aloud/
- Watson Text-to-Speech
  https://cloud.ibm.com/docs/text-to-speech?topic=text-to-speech-gettingStarted
  https://cloud.ibm.com/docs/text-to-speech?topic=text-to-speech-voices

Classroom Barriers to the use of TTS and How to Reduce Barriers

School districts may avoid many of these barriers noted below by designating a staff member to take the lead role in a "Train the Trainers" model of Test To Speech dissemination or roll out.

The following table summarizes some of the potential barriers and offers strategies for overcoming each potential barrier

Barriers	**Strategies for Overcoming Barriers**
Attitudinal: "Text To Speech is not really reading"	Text To Speech offers an alternative format for obtaining information. It can provide access to the curriculum for students who cannot read independently at grade level. Reading is more than decoding – reading comprehension involves making sense of text and applying the knowledge.
Classroom Management	Introduce Text To Speech to all students and encourage them to explore when, why, and how to use it most effectively.
"Won't the noise be disruptive?"	Using Text To Speech in the classroom requires that every student have their own headphones to prevent the audio from disturbing other students. Encourage students to bring their own headphones and leave a set in their desk. Ensure that each classroom has several extra sets of headphones for students who forget their personal headphones or replace headphones that are broken.
Lack of awareness	Some teachers may not be aware that text-to-speech is built into the operating system of all recent technology devices. Explore the accessibility control

	panel on your device to learn how to activate text to speech tools.
Lack of training	Teachers and parents may need a short presentation to learn how to make the most of text-to-speech tools. Check with your district technology specialists or assistive technology specialist on how to learn more about text-to-speech. **Also, check the section below on "Student Training"**
Time	Utilize the school or district's Assistive Technology or Technology specialist for help accessing electronic versions of reading materials. Also, network with the district's contact person with Learning Ally or Bookshare.
Different curricula	Text To Speech tools are built into a variety of technologies. Encourage students to explore the applications of their favorite text-to-speech tools when reading a webpage, viewing a PDF, viewing an e-book, writing in their word processor, as well as completing a worksheet.
Collaboration and lead time in providing timely resources	Hold a quarterly overview meeting with grade level classroom teachers to get major content that they will need in a quarter. Designate a weekly "tech time" with grade level classroom teachers to review upcoming needs for classroom units to make sure your caseload will have what it needs. Doing this at least a week ahead of time should allow the provision of accessible texts.
What happens when power fails?	Have 2-3 backup computers/tablets available for this or other situations (student forgets device)

Students having a negative stigma/not buying into using it	The best way to overcome this is to start young when possible and to train students on the technology and have them practice using it regularly. Then have them perform similar tasks with and without the technology so they are able to personally see the skill increase from the scores that they get from those tasks- This doesn't have to be the specific wordage, but this is really the best way to get student buy-in.

Credit: Don Johnston Incorporated

Hidden Barriers of Text to Speech

Acknowledging the hidden barriers of Text to Speech is a step we must take to move forward. One barrier is the ability to have immediate access to the technology. This means the teacher must have working knowledge, specific training on the platform of choice, and technology problem solving as it relates to Text to Speech to support the student when it needs to be used in the classroom. This is an investment of resources including time and money from the district. Also, the student likely needs instruction when beginning to use Text to Speech, while this may be minimal, it is a necessary step to consider based on the needs of each child. Another hidden barrier is the need for belonging from all students. If only one child in a classroom uses Text to Speech, he or she may experience feelings of being different or perceived less than compared to his or her peers. If all students are encouraged to use Text to Speech, then we have a model inclusive classroom. The purpose of the usage may be different such as coming to an unfamiliar multisyllabic word versus accessing an entire textbook. Another barrier to Text to Speech is the misunderstanding between instruction and Text to Speech. It is imperative for educators to understand that instruction continues while Text to Speech provides the access to enhance the student's strengths.

Rachele Breuer, Teacher and Director of Special Education, Cassville School District

How to address the Barrier of Training Students On Assistive Technology

This information is from the 2020 Illinois Assistive Technology Guidance Manual, pages 28-31.

Before addressing IEP goals and objectives directly, it is important to note that students do not become competent with all forms of Assistive Technology (AT) overnight. Instead, students progress through a series of stages of competence. Zabala, Bowser and Korsten (2004/2005) adapted Light and Buekleman and Reichle's (2003) stages of communication competence for alternative and augmentative communication users, then applied the concept to users of different varieties of AT. These stages include operational competence, functional competence, strategic competence and social competence.

Operational competence refers to attaining the knowledge and skills needed to use a particular piece of AT. As the authors noted, there is a difference between understanding how to use an AT tool and using it to complete a task effectively.

Functional competence is attained when an individual can use a particular AT tool or system to complete the task for which it was chosen.

Strategic competence refers to using the AT device in real-world settings on real-world tasks. A student who has developed strategic competence can identify the situations and conditions in which the AT tool could be used and how to apply it appropriately.

Social competence refers to attaining skills and strategies that allow the student to explain to others the purpose of the AT tool or system and how it will be used in various contexts. Social competence also may include developing the necessary self-advocacy skills to use an AT tool or system in multiple situations.

AT use ties directly to a student's IEP goals and objectives. There are three ways in which this may be done:

1. When the student is learning how to use the AT (i.e., developing operational competence), goals and objectives may be written to address the necessary special education services that may be provided to help the student become a competent user of the AT. In other words, if part of the student's educational programming will focus on teaching the student how to use the AT, then specific goals and objectives may be created to strategically plan for and guide the services that will help the student become successful in operating the AT. If special education services or related services are provided to help a student learn to use the provided AT, then outcomes of those services (e.g., operational competence) could be indicated within the IEP goals. Specific training activities may be noted elsewhere in the IEP (e.g., under Special Education and Related Services, Additional Information and Notes).
2. If a student has already developed operational competence in using the AT, schools may consider the use of the AT within an objective or benchmark the student must reach to perform a task according to specific criteria or within certain contexts. For example, a student who is working on reading comprehension may require the use of a Text To Speech (TTS) software program to demonstrate successful performance in answering comprehension-based questions about the text (i.e., functional competence). A student may also need to determine when to use the Text To Speech software program based on the task or the context (i.e., strategic competence).
3. Finally, a student may need to learn how to explain the reason he or she is using the Text To Speech program on reading tasks and advocate for the right to use the AT (i.e., social competence).

Data Collection

How to collect data to monitor student progress Using TTS or audiobooks

There are several ways of collecting data to determine if the Text To speech tool is effective for the student's use. These are listed below.

Dr. Dave Edyburn, Senior Research Scientist and Professor Emeritus at the University of Wisconsin at Milwaukee, notes that two models have emerged in the literature about how to measure technology-supported performance and quantify the benefits of AT use.

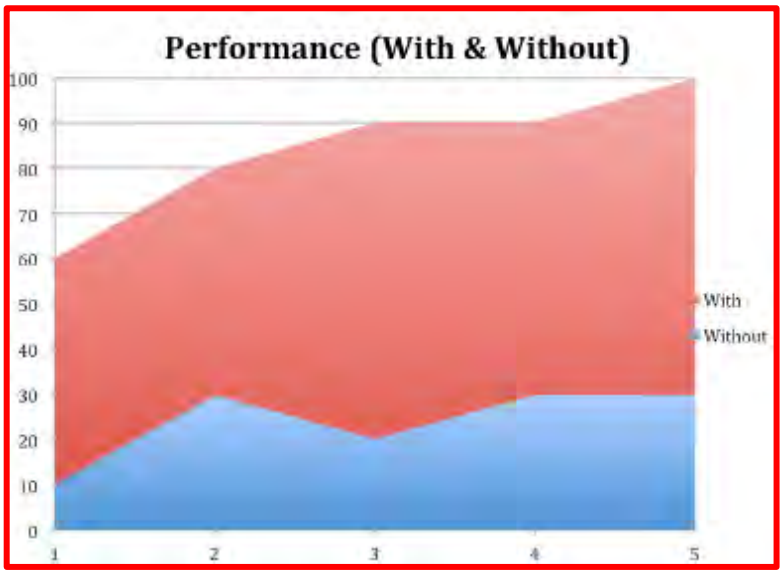
The TSCD Model

One model that can be used in any classroom to measure the outcomes of assistive technology is known as the *Time Series Concurrent Differential* (TSCD, Edyburn, 2004). The model has been readily applied by assistive technology specialists to assess the effects of text to speech use by students with disabilities (Hodapp & Rachow, 2010a, 2010b). The TSCD model of data collection requires teachers to prepare a set of tasks, in this case, reading passages, with a series of comprehension questions (usually 5 or 10 questions). Students are asked to read a passage ***without*** their assistive technology and then complete the reading comprehension assessment ***with*** their AT. The data you may wish to record (1) the date, (2) the time spent reading the passage, (3) the number of words in the passage, and (4) the percentage of questions answered correctly (x/5 or x/10). The same process is repeated by asking the student to read a new passage with his assistive technology and then recording the same data points. These activities can be completed on a daily basis for a week, or on an every other day basis for two weeks.

Once you have the data, create a simple two row spreadsheet to record the percentage of comprehension questions answered correctly as shown in the Figure below. Be aware as you construct the data table, the scores for the "With" performance subtract the difference from the "Without "row in order to build the image correctly (For example, if the student scored 60% on the "With" reading task, and scored 10% on the "Without" reading task, we would enter the "Without" score of 10 and then subtract the "Without" score of 10 from the "with" score of 60 in order to enter a score of 50 in the "With" row. The reason is that the two scores are additive 10+50=60 since the graph is cumulative.)

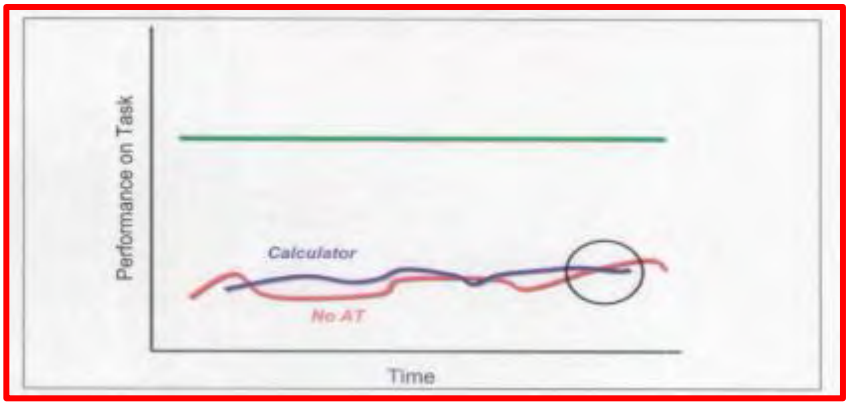
3	Without	10	30	20	30	30
4	With	50	50	70	60	70

Then, select a stacked area chart to graph the data. The data will be transformed into a chart similar to the image in the Figure below.



The reason we graph the scores in a stacked area graph is that we are trying to see if there is a difference in reading performance when no assistive technology is used (without) versus performance with the assistive technology. Our hypothesis is that there should be a *boost* in performance when the AT is used – as seen in the graph above.

Often this level of data analysis is sufficient for most teachers, parents, and administrators to conclude that text to speech is a promising intervention for the specific student. The TSCD model also helps us answer questions about performance over time that allows us to answer questions about learning and when there might be a situation when the AT is no longer needed (scenarios more common for spelling or math computation).



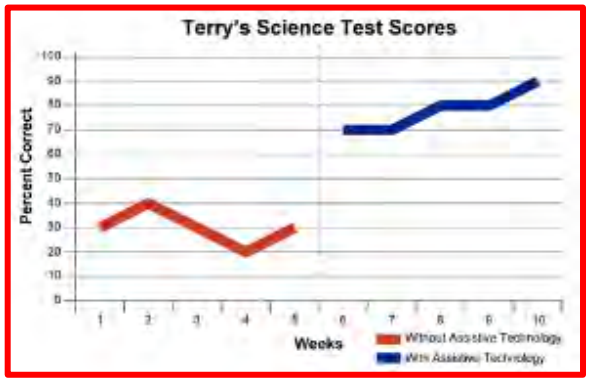
Parette, et al., (2007) describe a number of scenarios that might emerge. Can you imagine what the graph would look like if there is little difference between reading performance with and without AT? (The scores would be nearly identical and not illustrate a boost.) They offer the following illustration using the example of math performance with and without a calculator to illustrate a situation where we are not seeing a performance boost as a result of using AT.

Can you imagine what the graph would look like if reading performance with the AT is worse than unaided reading comprehension? (A very unlikely situation, but a scenario we should be prepared for.)

The TSCD model is easy to implement and has no additional costs for school districts. However, there is a small time commitment to (a) identify a set of comparable reading passages, (b) create 5 or 10 reading comprehension assessment questions, and (c) enter the performance data into a spreadsheet to graph the results. However, these activities should be a fundamental task for IEP teams to fulfill their AT Consideration responsibilities to determine whether or not a student will benefit from the use of AT.

The graph below demonstrates another way to document the effectiveness of using Assistive Technology (AT) in the classroom.

The graph below illustrates Terry's science test scores with and without AT. The red line indicates that his scores fluctuated between 20% and 40% correct over five weeks without AT. The blue line shows that his performance over the following five weeks with the addition of AT fluctuated between 70% and 90%. These data points illustrate a significant improvement in performance with the use of AT.



PAR and uPAR

A second approach to measuring the outcomes of text to speech on reading comprehension is to adopt a commercial assessment: **Protocol for Accommodations in Reading (PAR) and the Universal Protocol for Accommodations in Reading (uPAR)** PAR and uPar (https://learningtools.donjohnston.com/product/upar/) are screen protocols that gather data allowing for comparison across different accommodation conditions for individual students. uPAR and PAR measure reading comprehension in aided human audio and Text To Speech conditions, and compare this to reported independent reading levels (DeCoste & Wilson, 2012). The following description will assist teachers in determining which version will be most useful in their situation.

PAR is a PDF version available as a free download to administer to individual students. The pdf version takes 45-60 minutes per student to administer. PAR provides all the leveled materials and comprehension questions and steps to administer and score. Staff will manually score and document for each student. PAR manual also offers a rich review

of literature and recommendations. PAR eliminates the need for staff to develop their own materials and processes. It allows for consistency between staff and it is designed so that anyone on the IEP team can administer it. Disadvantages of this approach are time and staff efficiency. Time to learn or be trained in administration, time to administer, time to score. All this time takes away from time to review data, discuss data with students, parents and IEP teams as well as instructional time.

uPAR is a group administered version of PAR. Students can complete uPAR in one class period and teachers can administer this to an entire in-person class or it can be administered remotely… uPAR can be used as a Tier 1 screening tool for all students to gauge reading comprehension with reading tools. As districts move to 1:1 computer devices and online reading, it is important to determine grade-level reading access for all students – a UDL approach. For all students with reading delays, it is imperative to gather data to identify optimal reading comprehension using read aloud tools. Built-in uPAR algorithms determine optimal reading using human audio and Text To Speech with more efficiency, saving time and providing ready access to equitable AT services. uPAR screenings are automatically scored and teachers can review reports for the whole class and/or an individual student. Upon completion, student "data walks" provide performance summary in a graphic format for both the teacher and the student. Sharing this data with students often helps shift their perception of their ability as a reader and as a learner.

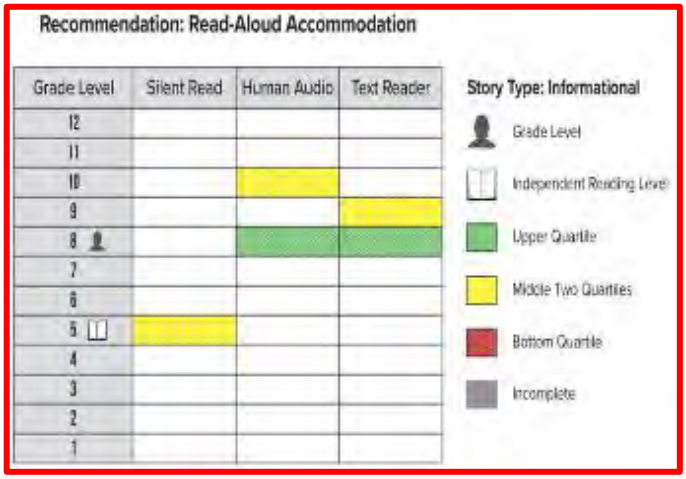
Figure A.

Figure A is an example of 3 students from a Wisconsin School district. The uPAR data gathered created a dramatic shift in understanding of the student's reader profile for both

the student, their family and their teachers. Figure B demonstrates the data graphically for an 8th grade student reading well below grade level. Color coded scoring indicates the benefit of human audio and a text reader. For the student in this example, the data suggests that human audio reading accommodations provide an increase of 3-5 grade levels of enhanced comprehension, and a text reader provides an increase of 3-4 grade levels of enhanced comprehension. Understanding grade-level access helps ensure students get the accommodations they need, but also the rigor of a rich academic curriculum. The data for this student clearly demonstrates reading accommodations supports this student with grade-level reading. This data can also guide decisions for specially designed instruction. For this student, the data indicates that lowering the rigor and simplifying reading materials is not the modification needed but rather the modification most beneficial to this student is AEM (Accessible Education Materials). This data also quantifies the impact of the Accommodation.

Finally the data indicates this student benefits from both Human Audio and a Text Reader. Therefore this student can utilize choice but also is ready to benefit from the independence provided with a text reader and digital materials vs. dependency on adult readers or human recorded materials. Editor: The highlighted sentence above not clear

Figure B. uPAR data graphic.

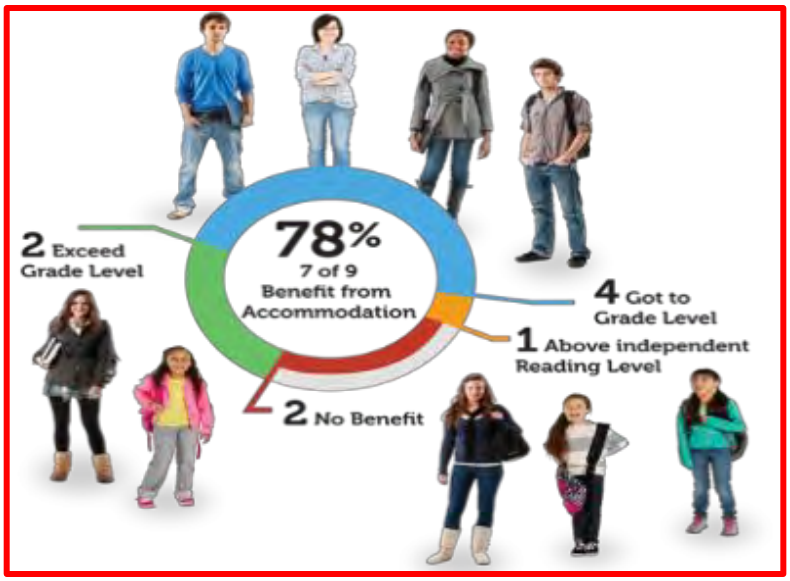


uPAR data can also be reported at the group level. This helps classroom teachers identify 4 uPAR reading accommodation profiles (Figure C)

Using text reader tools:

1. Students who read above grade level and need access to challenging reading material
2. Students who read at grade level
3. Students who can read above their silent independent reading level, but still below grade level
4. Students who need different solutions or need more time to build skills with a text reader.

Figure C. uPAR group data



Since uPAR is fully automated, it eliminates the need for extensive professional development. Increasingly, a data-driven approach is being required by states to qualify students for Text To Speech accommodations on state assessments. It shifts time demands away from gathering data to focus instead on actionable steps based on the data. uPAR is individualized for each student yet more efficient for the teacher. Expectations of timely access to Accessible Instructional Materials can be enhanced by administering uPAR at the start of the school year. uPAR can also be administered periodically to gauge improvement once reading tools are being used regularly.

Using PAR (pdf version), a resource teacher reported needing a full year to administer PAR to her 18 students. The next year uPAR was available and utilized. During the first week of the school year, the resource teacher reserved a single class period in the computer lab in order to collect uPAR data for all her students. This allowed her to strategically and efficiently plan and prepare for all her students while knowing individual needs. AEM was provided in a timely manner at the very beginning of the school year for all her students who needed them. She trained her students all together on the various AT and reading accommodations. The students felt supported, not "different". She created a culture of individualization, using technology and AEM. She was confident that each student had what they needed and she had time later in the year to use uPAR again to see shifts and changes needed for each of her students. Editor: what does the above highlighted phrase mean?

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Collecting and Analyzing Data

By Megan Mussano, M.S., Instructor at the University of Wisconsin at Milwaukee and Aurora University on *The importance of collecting and analyzing data to determine whether AT is effective for a student.*

There's no way to truly consider assistive technology unless you truly collect data, and analyze and evaluate that data to determine whether the AT is working for a student. Data is the foundation of just about everything we do in the public schools. As you work through the AT consideration process, the team will come up with an assistive technology tool to trial. You have to collect data to determine if that tool is successful or not. Data can look very different depending what assistive technology you are attempting to trial. It could look different based upon the task that the assistive technology is supporting. It really varies.

A lot of times when we're working with high-incidence disabilities, one of the issues or one of the tasks that they're struggling with is reading or writing. When it comes to writing, one of the common tools is a word-prediction program or speech-to-text tool. When we look at the data, determine if it's effective, effective could mean different things to different students. An assistive tech tool could be effective if it speeds up their writing, if it improves their spelling, if it improves the legibility of writing. Data can vary based upon the student's needs. Data-collection can vary based upon the task you actually want the student to accomplish or the task the student needs help with. Data-collection is essential, but it can also be a short process. We want to make it practical. Often I have a student complete a three-minute writing prompt, just handwritten, after I train them on the AT tool. I will then give them a similar three-minute prompt and ask them to write again. I'll do that a couple of times, comparing their handwritten writing to the typing or the AT tool, the word-prediction program. I will look to see what the data shows me. Are they spelling words more correctly? Are they producing more content? You look to see if it helps the student at all.

To determine whether AT is effective, the AT implementation team needs objective, as opposed to subjective, data. Teachers can evaluate students' performance by following the steps outlined below.

Step 1. Determine how to measure the expected outcome

The type of data the teacher needs to collect will vary, depending on what aspect of the student's performance they want to measure. To provide the most accurate picture of the changes in student performance they expect to see, the teacher can measure one of the following:

- Speed or rate: The *number of times the behavior occurs within a given timeframe* (e.g., the number of problems completed correctly in ten minutes)
- Accuracy: The *number of problems* or *percent of the work* that a student completes correctly (e.g., the percent of questions answered correctly on a test)
- Frequency: The *number of times* a behavior occurs within a consistent period of time (e.g., the number of times the student initiates a conversation during recess)
- Duration: The *amount of time* a student engages in a specific behavior (e.g., time on-task during independent classwork)
- Latency: The *time* between when a direction is given and when the student complies (e.g., how much time passes between when an in-class activity is assigned and the student begins working on it)

Step 2. Collect baseline data on the student's performance

The teacher should first collect baseline data—that is, data on the student's performance without the use of AT—on the aspect of student's performance the AT is meant to support. It is important to collect these data before the AT is implemented so the teacher can compare the student's performance before and after the AT is used. To collect these data, the teacher must use a data-collection form. These forms will vary depending on what aspect of the student's performance is being measured. Click below to view examples of a variety of data-collection forms.

- Sample Speed or Rate Recording Form
- Sample Accuracy Recording Form

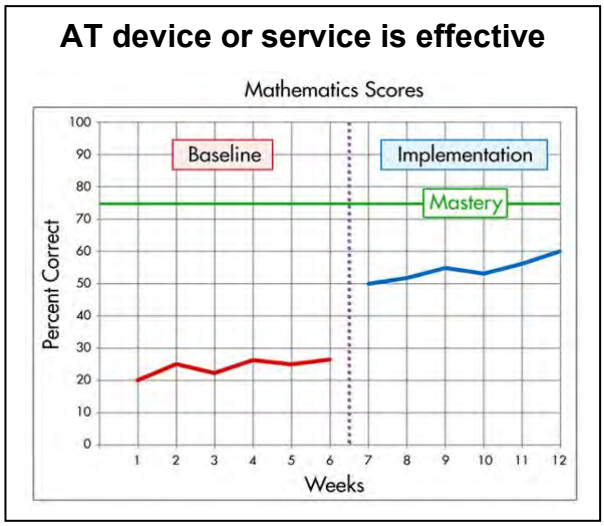
- Sample Frequency Recording Form
- Sample Duration Recording Form
- Sample Latency Recording Form

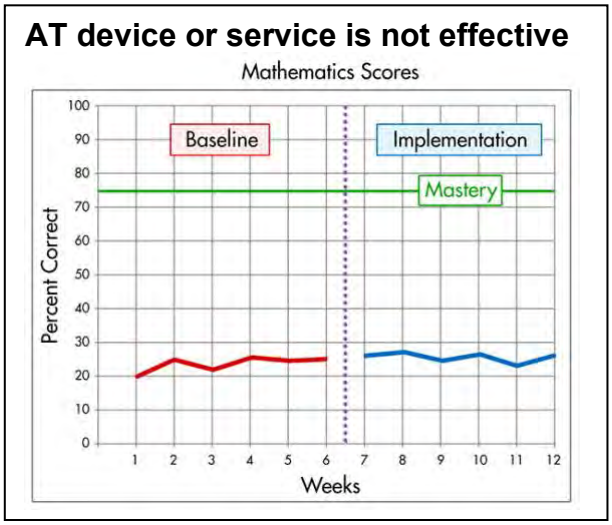
Step 3. Collect data when the student is using the AT

While implementing the AT, the teacher should collect data on the student's performance using the same method used to collect the baseline data. Once the AT has been implemented, a good rule of thumb is to collect four to six data points before evaluating its effectiveness.

Step 4. Evaluate the effect of the AT

The teacher can compare the student's performance data with AT to the baseline data to evaluate whether the AT has had the desired effect on that student's performance. Often, the best way to do this comparison is to graph the data to create a visual representation of how the student has responded to the AT. In the graphs below, note the difference in data patterns for when an AT device or service is and is not effective.





Data Collection and/or Measuring in the Classroom As well as documentation for the IEP Process

By Michelle Kaye Silverman, Assistant Professor, University of Wisconsin-Milwaukee

Goal Attainment Scaling (GAS) is another option for data collection. Originally developed in the 1960's as an outcome measure in mental health settings (Kirusek & Sherman, 1968), GAS was adapted for use in the rehabilitation field (Hurn, 2006) as well as in education (Joseph, et.al. 2014).

When implemented in the special education setting, Goal Attainment Scaling is an individualized measure using specific student, teacher and/or IEP goals standardized in order to calculate the extent to which a child's individual goals are met.

This process can be used with the whole class, small groups or individual students lending itself to measuring speech to text in each of these contexts. (Joseph, et.al.)

Each goal is identified by the student and/or team and the measurement levels are set individually based upon the student's current and expected level of performance.

GAS is a method of scoring requiring a specific goal to be set, for example:
Answering a selected set or number of comprehension questions after reading a passage. An important feature of this method is the establishment of criteria for an *attainable* successful outcome in advance.

When implemented in the rehabilitation setting, GAS Scores use basic elements are a 5-point scale implementing a very carefully defined "level 0" outcome which is the expected

goal. Then at the time of assessment the team and patient agree on whether the goal was achieved (0), slightly exceeded (+1); greatly exceeded (+2); not quite achieved (-1) or nowhere near (-2). In this description, a score of "0" would be an expected outcome.

Roach and Elliot (2005) proposed a shift in the framework for developing and utilizing GAS Ratings in the educational setting. They suggested identifying 0 as no change and a positive outcome would be a +1 or +2. Here is the process outlined:

1. Identify Concerns. In the case of reading, it might be lack of comprehension after reading a passage.

2. Analyze concern. This step would involve defining the concern so that the outcome may be identified in objective terms.

   Example: Teachers are concerned that the student's independent reading comprehension is significantly below grade level however, he seems to have better comprehension when the information is not independent reading.

   Outcome: James will consistently answer 4/4 comprehension questions after independently reading a 2-page nonfiction passage.

   NOTE: This outcome may be the annual goal. And then the graph may be used as data documentation for whether the student is making sufficient progress.

3. Plan Intervention: Teacher will identify the intervention strategy
   Example: Implement text to speech

4. Construct the Goal Attainment Scale: The basic elements are a 5 point scale ranging from Best possible outcome(+2), some improvement (+1), baseline performance (0), Slight regression (-1) and strong regression (-2)

Figure 1

Figure 1. Example of Goal Attainment Scale Worksheet and Graph

Student: James Grade: 4th

Date: 2/2/2021 Teacher: Mr. Miller

IEP Team: OT, SLP, Special Education

Current Behavior: James consistently answers 2/4 comprehension questions after independently reading a 2-page nonfiction passage.

Target Behavior: James will answer 4/4 comprehension questions after independently reading a 2-page nonfiction passage using text to speech.

Goal Attainment Scale with Criteria for monitoring academic change:

+2 James answers 4/4 comprehension questions after reading a 2-page nonfiction passage.

+1 James answers ¾

0 answers 2/4 comprehension questions after reading a 2-page nonfiction passage

-1 James answers ¼ correctly

-2. James answers 0/4 correctly

Graph:

GAS Ratings

+2

+1

5. Implement the intervention

6. Evaluate the Intervention: Evaluation may be done using a graph of progress using whatever interval of data collection is decided upon by the team.

When properly constructed and implemented, this method is time efficient, can be used across settings, is inexpensive and does not require extensive training or skill to implement. This form and graph may be used in the IEP process as well to document progress.

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The Use of TTS in Statewide Assessments

Teachers should **carefully** review each statewide assessment's Accessibility Guide for instructions on the use of Text To Speech (TTS).

Some Wisconsin statewide assessments include TTS in their Accommodation sections like ACT Aspire or the ACT Statewide. On the other hand, the Forward Exam does NOT include the use of the TTS option in its Accommodation section, but rather in its Designated Supports section. This option to use TTS is available to ALL students (including SwD) who use TTS in the classroom on a regular basis (see next page).

Forward Exam, Section II: Designated Supports

Please note that the TTS support option highlighted below is part of the Designated Supports section only, not the Accommodations section. SwD may use TTS in the Forward Exam if they use TTS regularly in the classroom and it is noted in their IEPs.

This section describes the TTS option in the Designated Supports section, spring 2021 in the Forward Exam. Designated supports are those features that are available for use by any student for whom the need has been indicated by an educator or team of educators (with parent/guardian and student input as appropriate) and are part of the student's classroom instruction. They are either provided as part of the online testing system (embedded) or separate from it (non-embedded).

Forward Exam Accessibility Guide

Embedded Designated Supports	Test Ticket Abbr.	Description	Guidance
Text-to-Speech (Computer Voice) (Not allowed for ELA Session 4 reading passages.)	TTS	The text-to-speech (TTS) function allows the student to listen via headphones or speakers to test information displayed on the screen. Words and numbers, test directions, questions, answer choices, and other information is read aloud by the computer and may be replayed as necessary. **NEW:** TTS automatic playing (autoplay) can be turned off if a student only wants to use this feature on demand.	Text-to-speech (TTS) (computer voice) is allowed as a designated support for all grades in mathematics, science, social studies, and English language arts (ELA) as appropriate (not allowed for ELA Session 4 reading passages). With this feature, test content is read aloud by the computer in the English language. The TTS designated support is intended only for students who are struggling readers who may need assistance accessing the assessment or for students with reading-related disabilities. Students should use a similar support on a regular basis in the classroom. Allowing TTS for all students is **not** a proper use of this support. Students who use this support will need headphones unless tested individually in a separate setting. See Appendix E for more information about TTS vs. Read Aloud, and Designated Support vs. Accommodation. The majority of students who require text read to them should use the TTS designated support, to ensure these students are provided a standardized support across the state. **This includes students who have IEP or 504 plans.** Human readers (Read Aloud) are ONLY permitted in cases where students cannot manage to work with the computer audio voice (e.g., some students with autism or hearing impairments). **NOTE:** Read Aloud (human reader) and TTS (computer voice) are mutually exclusive and must not be assigned together, because they are the same support provided in different formats (human read vs. computer read). Both supports provide the information auditorily, therefore only one needs to be selected. If you are unsure which support to provide, have the student use the Online Tools Training (OTT) with TTS (computer voice) prior to assigning.

ACT Aspire, Accessibility System, Level Support 3, Accommodations

Please note that the TTS option (highlighted in yellow below) is available for SwD.

Beyond the accessibility features available to all examinees, assessment accommodations are available to some examinees with a documented disability who have an IEP, 504 plan or other formal education plan. Assessment accommodations are changes made to assessment procedures that provide an examinee with access to comprehensible information without affecting the reliability or validity of the assessment.

Text To Speech in ACT Aspire is only available for Math, Science and Writing.

Accessibility and Supports Guide for the ACT Aspire

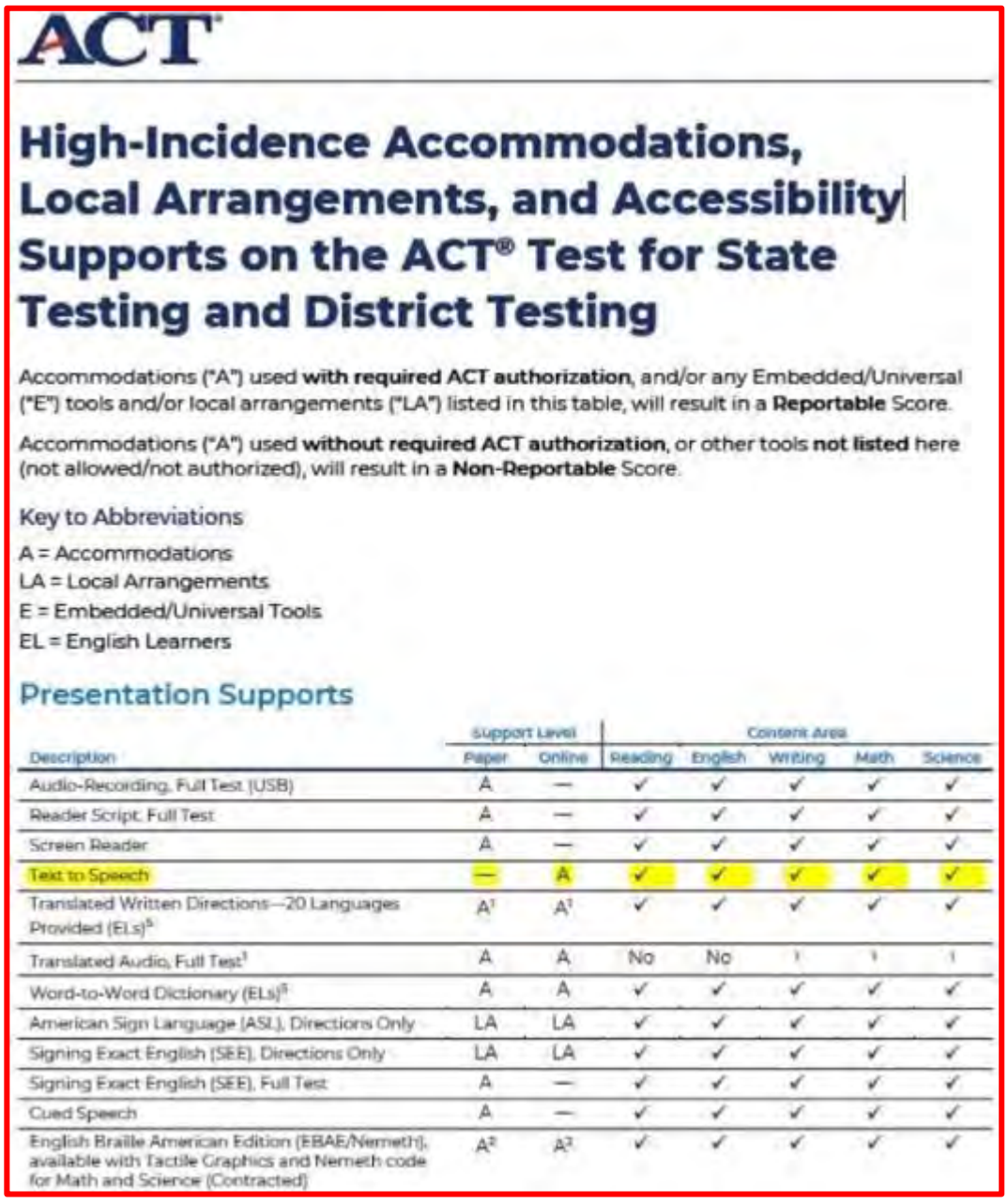
Accommodations used on the ACT Aspire must be used regularly by examinees in their educational environment, including during interim and summative assessments. Specific accommodations and their use must be documented on their formal educational plan. Qualified testing staff may request these tools on behalf of an examinee through the Personal Needs Profile (PNP). Some examples include:

- Text To Speech English audio (online)
- Text To Speech English audio + orienting description for blind/low vision (online)
- Text To Speech Spanish audio (online)
- Word-to-word dictionary (online and paper)
- Human reader, English audio (online and paper)
- Translated test directions (online and paper)
- Braille + tactile graphics (online and paper)
- Sign language interpretation of items
- Cued speech of items (online and paper)
- Electronic spell checker (online and paper)
- Extra time (online and paper)
- Breaks: securely extend session over multiple days (paper)

ACT Statewide

Please note that the TTS option (highlighted below) in the ACT is available for SwD)

Accessibility and Supports Guide for ACT



ACT

High-Incidence Accommodations, Local Arrangements, and Accessibility Supports on the ACT® Test for State Testing and District Testing

Accommodations ("A") used **with required ACT authorization**, and/or any Embedded/Universal ("E") tools and/or local arrangements ("LA") listed in this table, will result in a **Reportable** Score.

Accommodations ("A") used **without required ACT authorization**, or other tools **not listed** here (not allowed/not authorized), will result in a **Non-Reportable** Score.

Key to Abbreviations

A = Accommodations
LA = Local Arrangements
E = Embedded/Universal Tools
EL = English Learners

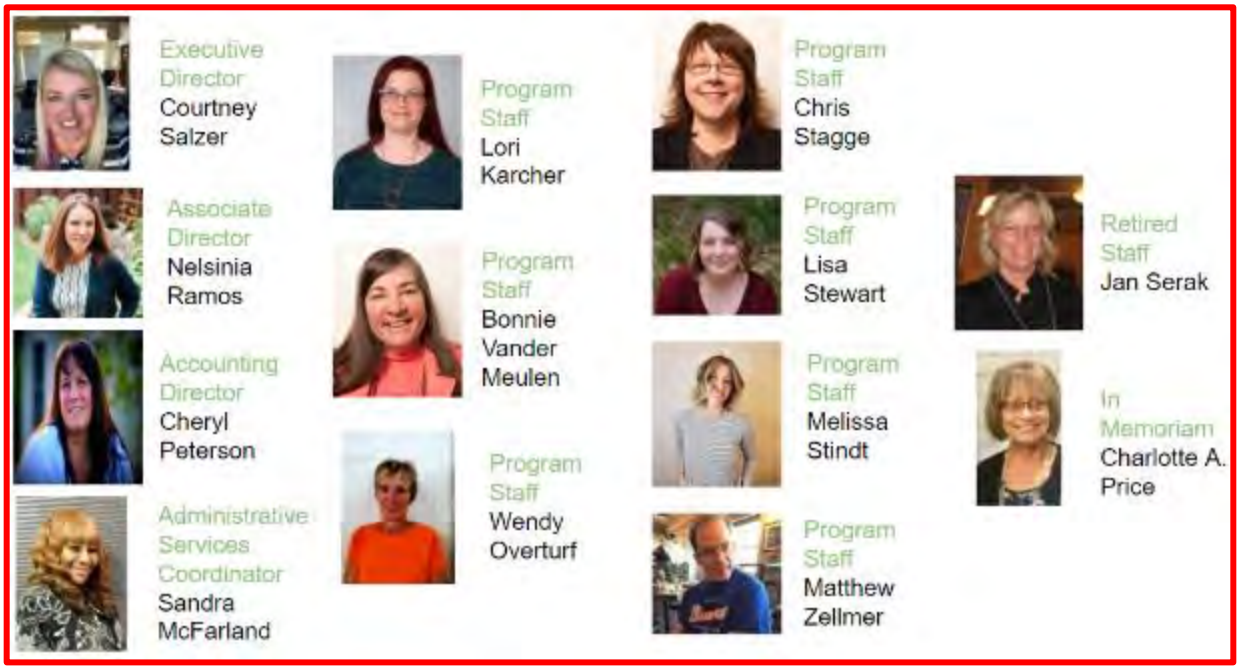
Presentation Supports

Description	Support Level		Content Area				
	Paper	Online	Reading	English	Writing	Math	Science
Audio-Recording, Full Test (USB)	A	—	✓	✓	✓	✓	✓
Reader Script, Full Test	A	—	✓	✓	✓	✓	✓
Screen Reader	A	—	✓	✓	✓	✓	✓
Text to Speech	—	A	✓	✓	✓	✓	✓
Translated Written Directions—20 Languages Provided (ELs)[5]	A[1]	A[1]	✓	✓	✓	✓	✓
Translated Audio, Full Test[1]	A	A	No	No	[illegible]	[illegible]	[illegible]
Word-to-Word Dictionary (ELs)[3]	A	A	✓	✓	✓	✓	✓
American Sign Language (ASL), Directions Only	LA	LA	✓	✓	✓	✓	✓
Signing Exact English (SEE), Directions Only	LA	LA	✓	✓	✓	✓	✓
Signing Exact English (SEE), Full Test	A	—	✓	✓	✓	✓	✓
Cued Speech	A	—	✓	✓	✓	✓	✓
English Braille American Edition (EBAE/Nemeth), available with Tactile Graphics and Nemeth code for Math and Science (Contracted)	A[2]	A[2]	✓	✓	✓	✓	✓

Important Information for Parents

WI FACETS

The Wisconsin Family Assistance Center for Education, Training, and Support (WI FACETS) is Wisconsin's Department of Education, Office of Special Education Programs (OSEP)-funded Parent Training and Information Center. WI FACETS' Help Desk staff can be reached at 877-374-0511 and can provide free support for parents, teachers, and others related to students with disabilities, including print disabilities, to help with access to Text To Speech and other technology referenced in this publication. WI FACETS' website includes many useful resources as well. WI FACETS' training calendar features over 100 webinars annually, including some related to AEM and Text to Speech for Students with IEPs and Writing IEPs.



PACER Center

This is a parent training and information center for families of children and youth with all disabilities from birth to young adults, funded by OSEP.

Located in Minneapolis, it serves families across the nation, as well as those in Minnesota. Parents can find publications, workshops, and other resources to help make decisions about education, vocational training, employment, and other services for their children with disabilities.

The Pacer Center information on Reading with Audiobooks and Text to Speech[28]

Introduction

Listening to books and other material read aloud can help individuals to better focus and comprehend the content. To understand reading materials, an individual must first be able to perceive (recognize or identify) the content through one of the senses such as sight (e.g., reading text with the eyes), hearing (e.g., audiobook or text-to-speech), or touch (e.g., braille). For some individuals, hearing may be the only meaningful way to receive information. In this case, listening to content may be helpful.

Credit: Don Johnston Incorporated

Technology offers options that can lead to greater independence by helping individuals with disabilities to perceive, focus on, and understand the content of reading materials. For example, audiobooks (typically audio files narrated by a person) and text-to-speech

[28] https://www.pacer.org/transition/resource-library/pdf/getting-started-audiobooks.pdf

or TTS (a computerized voice that reads digital text aloud) are two helpful options for many people.

First Steps: Trying Audiobooks and Text-to-Speech (TTS)

Step 1: Find a free audio book or TTS program

- To decide what kinds of options could be helpful for you, borrow audiobooks from the library and try free versions of TTS programs (e.g., Natural Reader, Read & Write for Google Chrome extension, Voice Dream Reader) to read digital text on websites or other digital text files.

Step 2: Identify the settings that work for you

- Try the various voices offered and choose one that helps you hear the content best.
- Try different reading speeds to find what fits best for you and the content. You may prefer different speeds for different content at different times.
- Consider whether it is important to see the text while listening to the content. Most TTS programs will display the digital text while the digital voice reads aloud. Some TTS programs also provide synchronized highlighting for visual tracking. Most audiobooks do not provide text and audio pairing, but you can follow along in a print book or digital text.

Step 3: Read without distractions to help focus

- Use these tools in a quiet, distraction-free environment to reduce competition for your attention.
- Use the tools you need to help with focus and attention while you are listening.

Step 4: Use comprehension strategies to actively listen and engage with the content

- As you listen, pause the reading periodically to use active listening skills and engage with the content: reflect, reread, interpret, and analyze.
- Take notes as you actively listen and engage with the content.
- If you encounter a word you don't know, pause the reading to look up the definition and take notes. Then rewind a little before you resume reading so that you hear the new word again in context.
- If parts of the reading don't make sense, or if you were distracted for a moment, stop the reading and rewind to listen again. If you still don't understand the content, ask questions or look up more information on the topic.
- Use a timer to remind yourself to pause and use these strategies and techniques.
- Ask yourself: Does listening to the content and using these strategies help improve your comprehension?

Next Steps: Acquiring Reading Materials and Tools

Step 5: Acquire the needed audiobooks or digital text

- If listening is helpful and effective, you will need to find the books and other reading materials in an audio or digital text format.

Options to find free content

If the book is a classic, out of copyright, or not protected by copyright, you might be able to find it from a free source such as Project Gutenberg or Librivox (online resources).

Check with the library to see if audio books and digital books are available for loan. Many libraries have current books available.

Options to buy content

Many different stores and websites sell audiobooks and digital books. When you buy a digital book you are often committed to read that book using the sellers' provided program or app (e.g., Kindle or Nook devices or apps). Review the features of a specific device, program, or app to determine if text-to-speech is provided.

Options for individuals with a print-related disability

If you have a disability that affects your ability to read traditional print materials, talk with a professional who provides disability services at your school. The school may be able to provide you with free access to Bookshare.org or Learning Ally (online resources).

Step 6: Create digital text when necessary

- Some content looks like text but is actually an image that TTS programs aren't able to read. If you encounter this issue, you may want to use a program such as Read & Write Gold by Texthelp or Snap & Read by Don Johnston that applies optical character recognition (OCR) to screen shots of the text.
- If audio or digital text cannot be found for a particular item, it can be created using a scan-and-read software or technology that utilizes optical character recognition (OCR) to create digital text. Note: Some material may be subject to copyright law.

Step 7: Learn more about audiobooks and digital text

- The Center on Technology and Disability (CTD) provides a variety of resources on Accessible Educational Materials (AEM), including information on audiobooks and digital text. Learn more at ctdinstitute.org.
- PACER Center offers many helpful resources. Learn more at PACER.org/STC.
- Visit The National Center on Accessible Educational Materials (AEM) at aem.cast.org where you'll find two helpful articles on this topic: "Acquisition of AEM" and "Higher Education and AEM."

Step 8: Explore and select your TTS tools

- To learn more about the different TTS tools, talk with school professionals, disability services staff, an assistive technology center, or a state assistive technology program.

Example

Emma is a bright, cheerful 9th grader who loves animals. She really enjoys math and science, but not reading. Emma doesn't like reading because it takes her a long time, is exhausting, and after making the effort to read the material she still has a hard time understanding the content. Emma has a reading disability. She can understand the content of her reading materials faster and better when someone else reads it aloud and she follows along in the text.

Emma joined Bookshare so she can access textbooks and other reading material in a digital text format. With digital books from Bookshare, she is able to see the text and hear it read aloud at the same time with a text-to-speech program.

Emma uses an app on her iPad called Voice Dream Reader by Voice Dream, which she purchased from the iTunes app store. She can download reading material directly into the app and use the text-to-speech features to hear the materials read aloud along with synchronized highlighting, which highlights words as they are read by the program. This helps her follow along and be more focused. She also uses a fidget (a handheld object such as a stress ball or wad of silly putty), and sits on a balance ball in a distraction-free area. After Emma selected a "voice" she liked from the various options, she tried different listening speeds and chose one that works well for her. She also changed the visual settings for background color, font color, font type, font size, and margins in order to see the text more clearly.

In addition to listening and following along in the text, Emma uses many comprehension strategies to help her better understand what she is reading. Here are some examples:

- Emma stops when she encounters a word she doesn't know and ***looks up the definition***. She then ***rereads the sentence*** to understand what the word and sentence mean.

Credit: Don Johnston Incorporated

- To help her remember and understand what she is reading, Emma ***uses the highlighter tool*** provided in the app to highlight and save information to review later.
- For complex topics, Emma pauses after every paragraph or section to ***review what she learned*** and ***find answers*** to her questions. If she doesn't understand something, or missed some information, she ***replays*** those sections.
- Using the note taking feature in the app, Emma frequently ***writes summaries*** and her interpretation of what she is reading. She ***relates that to her personal experiences***, opinions, knowledge, and information about the topic.
- Emma occasionally ***sets a timer to remind herself*** to use these strategies while reading.

Emma likes to learn about animals, and she will often look up information online and read journals and magazines about the subject by using text-to-speech tools, such as Read & Write for Google and Snap & Read which allow her to read with her ears.

Sometimes she encounters words that look like text but she is not able to select the words and use her reading tools. When this happens, Emma uses the snapshot tool in Snap & Read to convert the image to digital text that the program can read aloud.

Some material is only available in printed form. In this case, Emma uses a scan-and-read program, or an app such as Prizmo, which uses optical character recognition (OCR) to convert a picture of the print copy into digital text. The text can then be sent to Voice Dream Reader to read aloud and use the study tools.

Thanks to innovative technology and the comprehension techniques and tools she now uses, reading is much easier. Emma can read faster, read more, read independently, and better understand the content. Most importantly, Emma can now enjoy reading!

Credit: Don Johnston Incorporated

The ‘Understood’ Website

An overview of Audiobook Text To Speech: https://www.understood.org

Both audiobooks and Text To Speech (TTS can help kids who have reading issues like dyslexia. These types of assistive technology let kids listen to a book being read aloud as they look at the words. But audiobooks and TTS are different in key ways. Use this chart to find out the differences.

Did you know that your child may be eligible for free digital text To Speech books? Learn more.

There are many different TTS voices. As technology improves, the voices sound more and more natural. But since TTS is a digital voice and not a human voice, the reading may have:

- Words pronounced wrong.
- Pauses in places that don’t make sense.
- Words read in a tone or with an emotion that doesn’t make sense.

	Audiobook	Text-to-Speech
What it is	An audio recording of a book being read aloud.	A technology that speaks aloud digital text, such as books, news articles, magazine articles and websites, on a computer or mobile device.
Type of reading voice	Human voice	Computer-generated voice
How the voice sounds	Audiobooks are usually read aloud by actors. Because a person reads the text, audiobook readings tend to include things like: • Changes in tone and emotion	There are many different TTS voices. As technology improves, the voices sound more and more natural. But since TTS is a digital voice

	• Pauses in the reading at natural places, like at the end of sentences	and not a human voice, the reading may have: • Words pronounced wrong • Pauses in places that don't make sense • Words read in a tone or with an emotion that doesn't make sense
Technology Format	Typically a digital file. Audiobooks are often formatted as MP3 files that can be played on a computer or mobile phone.	Software or program. Many electronic devices come with TTS built in. TTS is also available in a wide range of apps and programs.
How it's used with visual text	Kids listen to the book read aloud. They may have a printed copy of the book and turn the pages to follow along. Or they may follow the words on a screen.	Kids listen to the text spoken aloud as they follow the words on a screen.
Highlighting words	Most audiobooks don't highlight words as they're read aloud. However, some newer versions of audiobooks sync the audio recording to digital text. In that case kids can hear words read and see them highlighted on a screen.	Many TTS tools highlight words as they are spoken.
Moving around in the text	You can jump around to different parts of an audiobook. But it can be hard to find a specific passage or sentence, since you have to rewind or fast forward to locate it. Some newer audiobooks sync with digital text. In that case, you can scroll or use Control/ Command+F to search for chapters, page numbers and even words.	With TTS, it's easy to find a specific part of a book. You can search the table of contents or look for particular words using Control/Command+F. TTS then reads the text that is found.
What to know about cost	An audiobook is a recording of just one specific book. You can	TTS software can be used for any digital text. Once

	buy an audiobook for every book your child wants to read. Or you can use a service and pay a yearly fee for as many audiobooks as your child chooses to read. Costs vary: • Audiobooks can be free or inexpensive. You might find them at your local library • Newer types of audiobooks that sync to digital text cost more but can still be reasonably priced	you have it, you can use it for multiple book and for other uses, such as reading email. Costs vary: • TTS software may be free if it's built into a mobile phone, tablet or other device • TTS programs can range in price. Many come with a more natural- sounding voices and features like a built-in dictionary or the option to speed up or slow down the reading speed
Where to find it	Some places to look for audiobooks: Learning Ally • Both school building and district pricing available includes: ✓ Unlimited simultaneous access to audiobooks ✓ Educator reporting and tools ✓ Implementation support • Students with reading deficits or disability are eligible • 80,000 audiobooks available • Learning Ally is a nonprofit organization Commercial Services • Audible.com: $14.95/month for one audiobook, from a selection of 100,000+ titles • Kindle: $9.99/month for unlimited access to 3,000+ audiobooks • Amazon Immersion: Prices vary; allows some audiobooks to sync to digital text	Some places to look for TTS resources: Bookshare • Free for U.S. students with a documented print disability • $50/year plus one-time • 660,000+ digital TTS books • A project of Benetech, a nonprofit organization and Understood founding partner Commercial Services • Kindle: $9.99/month for unlimited access to 4 million digital books; requires an app or built-in feature for TTS Built in TTS • Mobile Devices using iOS or Android have free TTS features Apps for Purchase

	Apps for Purchase • For example, Shakespeare in Bits ($14.99) • Explore more audiobook apps in Tech Finder	• For example: Voice Dream Reader ($9.99) • You can explore more TTS apps in Tech Finder

Assistive Technology Resources from the Understood Website

Assistive Technology Resources

Strategies for Assistive Technology Negotiations Between Parents and Schools

Published on the Wrightslaw website

Strategies for Assistive Technology Negotiations adapted from an Advocacy Institute presentation on Assistive Technology by Dave Edyburn, Ph.D. University of Wisconsin - Milwaukee		
If a School Official Says…	**A parent might respond (in writing)…**	**Resources**
1. We've considered your child's need for assistive technology and have determined that s/he will not benefit…	...I would like to review the documentation that supports your decision. In particular, I would like to see the data regarding performance with assistive technology and performance without.	Remediation vs. Compensation Chapter 1 - Consideration Guide WATI Assessment Package
2. Best practice suggests you always begin with no-tech solutions first...	...Consideration should not be a linear process of trial and error. Rather, all possible solutions should be explored.	WATI Assessment Package
3. We can't afford that...	...Cost cannot be considered a factor in AT consideration.	Funding AT
4. We are not sure what types of AT are out there...	...What steps will you take to fulfill the AT consideration mandate?	Texas AT Training Modules AT Parent Guide - AT Tools
5. It's not clear that (the student) actually does better with the AT...	...I would like to see the data that supports such a conclusion. Typically, we need to review performance data over time, with and without the technology to come to such a conclusion.	How do you know?
6. We don't want him to become dependent on a text-reader...when will he ever learn to read...	...Since the student doesn't have the independent reading skills and the expectation in grade 4 and beyond is to access large amounts of text, how will you demonstrate that he has access to the curriculum without a text-reader?	Learning from Text
7. Your child is not the only one that	...I can appreciate your concern, but my primary interest is the success of my child. As a result, what are you	Fairness

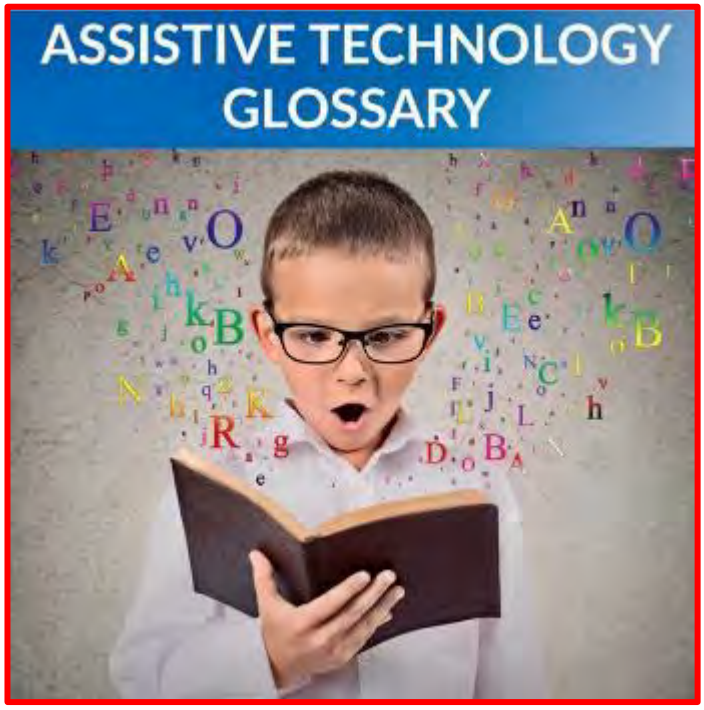
struggles with this problem...	going to do to ensure that my child is successful?	
8. We will provide some specialized technology but there is no need to write it on the IEP...	...I am pleased to hear that assistive technology will be provided. However, to ensure the rights of all parties are protected, our plan for acquiring and using AT should be written on the IEP.	Documenting AT Needs in the IEP Chapter 15 - Documenting AT Needs in the IEP
9. We are not authorized to make a decision about AT...	...I am disappointed to hear that. I guess we will need to adjourn the meeting until an appropriate administrator is here.	Texas AT Training Modules
10. The textbook is not available in digital format...	...That's unfortunate. That means that the textbook must be scanned using a "scan and read" program such as Kurzweil or WYNN or be professionally scanned.	Scan to Speak Programs
11. Copyright laws do not permit us to have your child's textbook scanned.	Because my child is reading is ___ grades below grade level, s/he requires alternative ways to access the general curriculum. *	Ensuring Access for Students with Print Disabilities
12. The student isn't eligible for AT because he does not meet criteria for a "print disability" under Chafee...	...Many students with learning, hearing, or other cognitive disabilities who need AIM will not qualify under copyright law as a student with a "print disability" (e.g., dyslexia); yet it is still the responsibility of SEAs (State Education Agencies) and LEAs (Local Education Agencies) to provide AIM to them.	Legal Issues Associated with the Provision of AIM to Students with print Disabilities Ensuring Access for Students with Print Disabilities
13. The student must have an Assistive Technology evaluation before s/he can be provided with grade level textbooks in accessible formats...	...Accessible Instructional Materials (AIM) must be provided in a "timely manner" ("at the same time as other children receive instructional materials").	Ensuring Access for Students with Print Disabilities 34 C.F.R. §300.172(b)(4) Access to instructional materials.
"With the advent of cost-effective and efficient digital scanning technology, local districts have significantly increased their capabilities to digitize books directly into more accessible digital formats. … in the absence of accessible materials from publishers, scanning a book may be the most effective method of providing instructional materials to print-disabled students, at least for the immediate future."		

Return to Table of Contents

Glossary

This chapter includes links to glossary resources.

1. National Accessible Educational Materials Center Glossary
2. Center on Technology and Disability (CTD)
3. Colorado State University Assistive Technology Glossary
4. Brainline Assistive Technology Glossary
5. Utah Parent Center Assistive Technology Glossary



6. Pennsylvania Training and Technical Assistance Network