An Educator's Guide to Assistive Technology Resources

Compiled by Henry Cohn-Geltner

Preface

Whether you are brand new to education or you have been a lifelong educator, you have come across these two little words: assistive technology. These two little words seem simple enough to suggest their role in the world of education; technology that assists an individual's ability to function and learn. The field of Assistive Technology, or AT, is being shaped daily by evolution in legislation, technology developed in industry, and the use of technology in everyday life. This guide is meant to serve as a primer on some of the devices and tools you can use to help your students thrive in your classroom.

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Chapter 1: Reading Tools

As as educator, you understand the importance of building confident and competent readers, beginning at an early age. For students with a print disability, such as dyslexia, developing skills in all of the major reading areas can be a challenge. AT can help struggling readers function in a general education classroom. Students will be able to access content, participate with their peers, and build necessary skills in literary development. Some categories of tools include; text-to-speech software, alternative book formats, and display controls.

Text-to-Speech

Text-to-Speech (TTS) tools allow a user to have text presented in digital format (eg: on a screen) read aloud, using a computer-generated voice built into the software. In the next few pages, you will learn about some TTS tools that are affordable and easy to use.

(*The logos include hyperlinks to take you to the website of the featured tool.)

Bookshare

Overview: Bookshare is a service that provides books in "accessible" formats, meaning, their books are available in various formats, including TTS and Braille. In addition, Bookshare books will highlight words on screen, and allow users to create bookmarks and annotations.
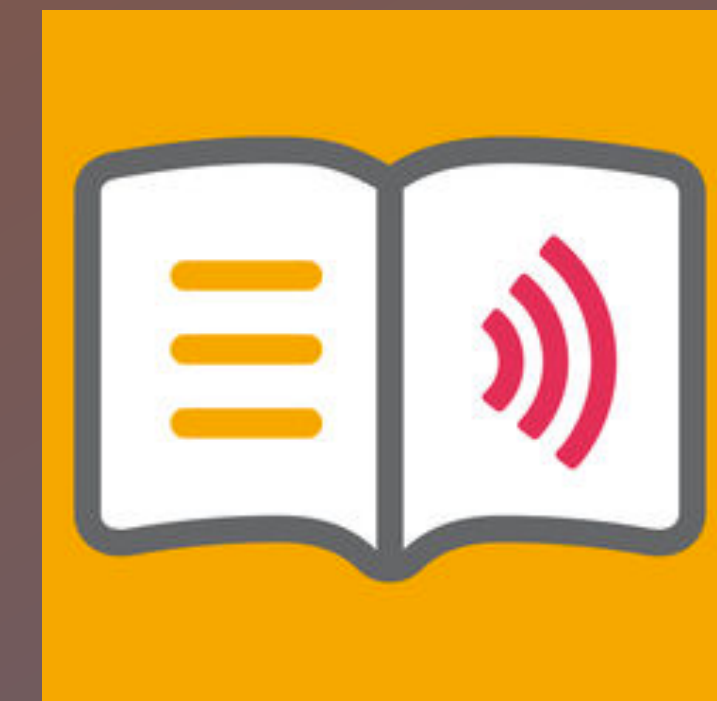
Intended User: Students with a visual impairment physical disability, or severe learning disability.

Cost: Free, for students with proof of disability

EasyReader

Overview: EasyReader is both computer software (Windows only) and an App (iOS and Android) that allows a user to download books and periodicals, and read them in accessible formats. Using TTS, EasyReader materials use a computer-generated voice to read, highlights words that are being read for tracking, and allows the user to create audio or text notes in linked to bookmarks. Links to third party providers of printed material (local libraries and Bookshare).

Intended User: Students with a visual impairment physical disability, or severe learning disability.

Cost: Free, must have a library or Bookshare account

Read&Write

Overview: Read&Write is a tool that allows students to use TTS with any web document, including Google documents, webpages, and email. Also features; text prediction, speech-to-text, highlighters, dictionary, and picture dictionary.
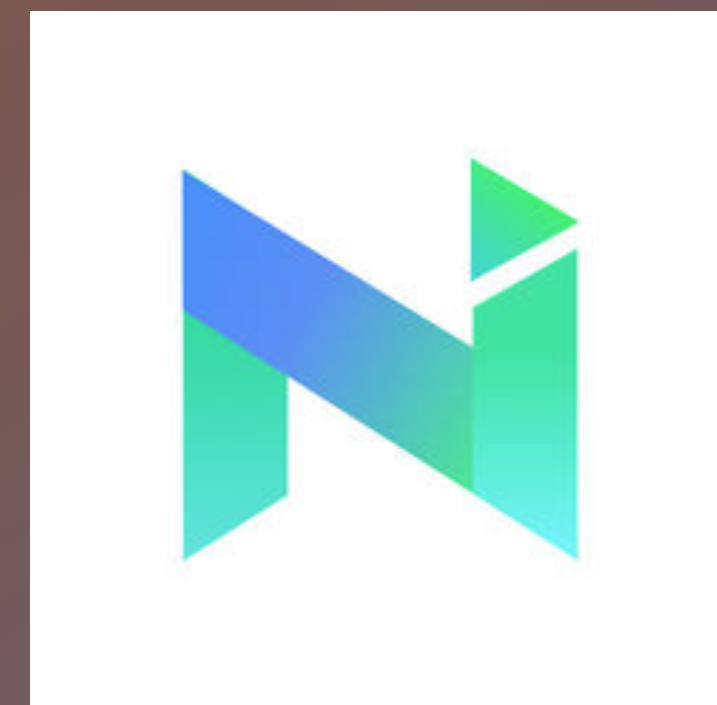
Intended User: Students with a visual impairment or severe print disability.

Cost: $12/annual license (min. 150 licenses); $1.75/annual license (min. 350 licenses)

NaturalReader

Overview: NaturalReader is a a tool that allows users to use TTS in one of two ways: Online or via software downloaded to a Windows or Mac computer. The free version of the software includes; TTS, compatibility with many common document formats (eg: PDF, Docx, and ePub), and a floating bar to read text in other applications. The online version works similarly in that it is free. You can drag and drop files, or copy and paste text directly.

Intended User: Students with a severe print disability.

Cost: Free (paid version available with additional features)

Audiobooks

Audiobooks are an excellent alternative to print books for students with a print disability. The difference between an audiobook and TTS is that Audiobooks are exclusively just print books recorded and presented in audio format; they lack the ability to track text along with the audio that a TTS enabled book features. The biggest difference and benefit to users, is that Audiobooks often use real human voices, instead of computer-generated voices, allowing for a more enjoyable user experience. They are also a better option for students who have visual impairments, where tracking text would be difficult.

Lit2Go

Overview: Lit2Go is a project in collaboration between the Educational Technology Clearinghouse and the University of South Florida. They present hundreds of stories, books, and poems (most in the public domain) for users. Each entry features citation, playing time, word count, and a reading strategy, as well as audio, to assist in listening.

Intended User: Students with a print disability and visual impairment, emerging bi-lingual learners.

Cost: Free

Open Culture

Overview: Open Culture is a repository of free and open source media content. Their Audiobook library consists of material both in the public domain and content made available for free by contemporary authors. They include fiction, non-fiction, and poetry.

Intended User: Students with a visual impairment or severe print disability.

 Cost: Free

OverDrive

Overview: OverDrive is a service that has paired with local libraries all over the US to host eBooks and Audiobooks. All you need is a library membership and you have access to thousands of titles provided through your local library.

Intended User: Students with a print disability, emerging bi-lingual learners.

Cost: Free (library participation required)

Display Controls

For many learners that have visual impairments that affect the way they view information, a solution might be to give them control as to how the information is displayed.

When reading text, especially on a screen, having control over font size, color, and kerning, or space between text, as well as masking text, can have a significant change on their experience and engagement with the material they are reading.

The nice thing about these tools is that there are many low-tech solutions to help readers with visual impairments.

Reading Strip

Overview: A reading strip is a piece of plastic (typically), that allows a reader to isolate a single line of text at a time. The user holds the strip in place and guides it down the page (or screen) as they read. The purpose is to discriminate text to eliminate confusion from text that is spaced too closely together.

Intended User: Students with a visual discrimination disability and difficulty focusing.

Cost: Free (homemade); Low-cost options available at many retailers

Chapter 2: Writing Tools

As as educator, you understand the importance of building confident and competent readers, beginning at an early age. For students with a print disability, such as dyslexia, developing skills in all of the major reading areas can be a challenge. AT can help struggling readers function in a general education classroom. Students will be able to access content, participate with their peers, and build necessary skills in literary development. Some categories of tools include; text-to-speech software, alternative book formats, and display controls.

Brainstorming

Brainstorming tools come in all shapes, sizes, and varieties. They include many different formats, including mind maps, graphic organizers, charts, and word webs. There is no one way to introduce tools to help struggling writers brainstorm and craft their ideas. For all of the tools listed, there is a range of options on the spectrum from low-tech to high-tech.

(*The logos include hyperlinks to take you to the website of the featured tool.)

Popplet

Overview: Popplet is a tool that allows users to generate ideas using visual representations.
Users can share ideas by creating original mind maps, create word webs, and ideate new ideas. Students can use the tool to also collaborate and share ideas for projects and assignments.

Intended User: Writers who struggle generating ideas.

Cost: $4.99 (for iPad); $3/month or $30/yr for web-based version.

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MindMeister

Overview: MindMeister is a collaborative mind-mapping tool that allows users to generate unique, original, and personalized mind maps using dynamic visuals for brainstorming, planning, notetaking, and project organization.

Intended User: Writers who struggle with organization and ideation.

Cost: $4.99/month (personal use)

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Ideament

Overview: Ideament is a simple, clean, and elegant solution for users to create mind maps, concept maps, and flow charts. The interface is uncluttered, allows for users to color code ideas, and easily store multiple projects.

Intended User: Writers who struggle with generating ideas and with visual impairments.

Cost: Free

MindMup

Overview: MindMup is another free, web-based mind mapping tool, that allows users to quickly share and send mind maps to one another. The interface and design are clean, and the tool has a sophisticated editor.
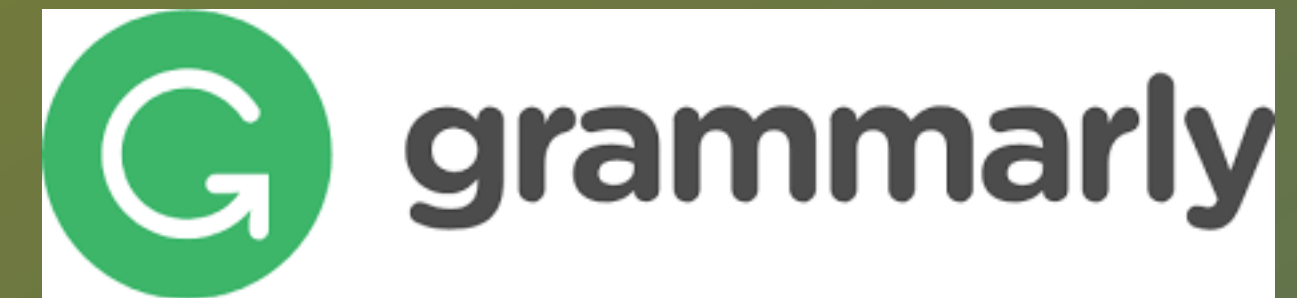
Intended User: Writers who struggle with organization and visual impairments.

Cost: Free

Grammar

One area in which many emerging writers struggle is in appropriate use and editing of grammar. There is great debate and interest in the practice of teaching grammar to young students and, especially, with struggling writers. The fear is that an overemphasis on editing grammar will squash the joy and love of writing. Teachers recognize the importance of teaching and upholding the standards of appropriate grammar, but at what expense to their ability to cultivate new, confident, and engaged writers.

Grammarly

Overview: Arguably the most well known grammar checker on the market is Grammarly. This is a robust, powerful tool that (in the free version) will check Spelling, Grammar, Punction, and Conventions of writing, using the mobile app or the web-based platform. (There is a premium version with more complex features.) This is a great place to start the conversation and make simple adjustments to a student's writing.

Intended User: Students with print disability writers that struggle with memory and attention.

Cost: Free (Premium version available)

Ginger (Chrome Plug-In)

Overview: Ginger embeds into your Google Chrome browser and offers a cutting-edge proofreader, rephrasing tool, translation service, suggests contextual synonyms, and has a dictionary to provide definitions.

Intended User: Writers who struggle with appropriate grammar and spelling.

Cost: Free (Premium plans available)

Dictation

Dictation software is a powerful, high-tech solution for writers that struggle with many norms of writing, get fatigued easily from the rigor of writing, and struggle with the pace of writing. These tasks are especially arduous when advancing to higher levels of schooling, when the cognitive demand and expectations for production are increased. This solution is a natural fit for students that are unafraid to talk and record their ideas. Overall, dictation software works by capturing your voice and converting the sounds into words, punctation, and symbols.

TalkTyper

Overview: TalkTyper is a fully web-based speech-to-text, dictation software. The user clicks on a microphone icon to begin recording. The website captures your speech, transcribes it, and then copies it into a dynamic text editor.

Intended User: Writers who struggle with pace and rigor of writing.
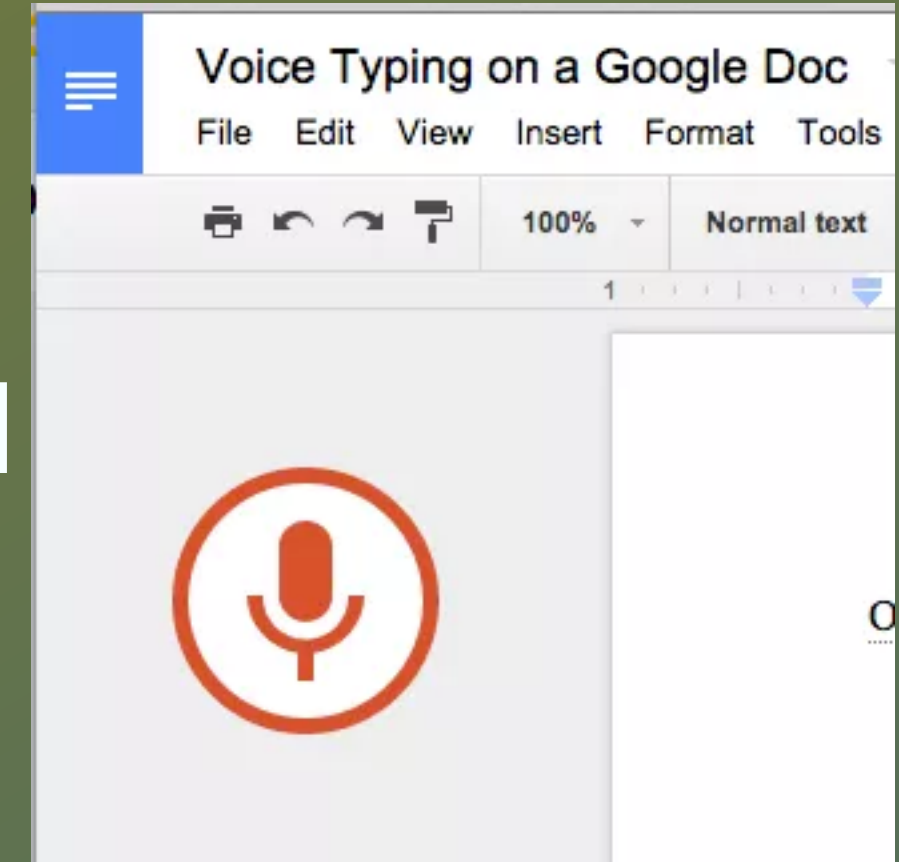
Cost: Free

Voice Typing w/ Google

Overview: Voice Typing in Google Docs is a powerful tool that is fully embedded within the Google Docs software. A user enables Voice Typing, clicks on the microphone icon, begins recording, and the software transcribes directly into a Google Document. From there, a user can easily edit the document.

Intended user: Writers struggling with idea generation, pace and rigor of writing.
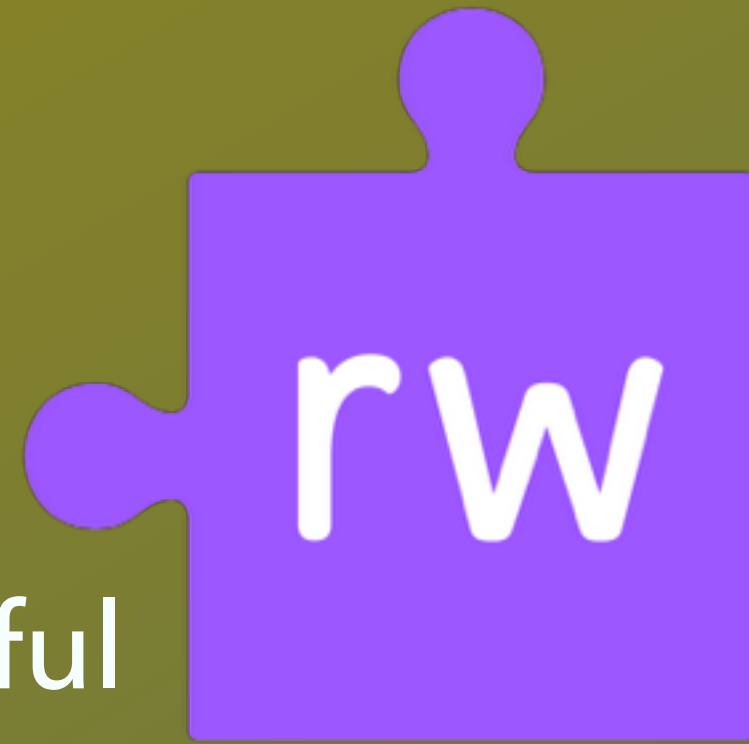
Cost: Free (Reqs Google account)

Read&Write

Overview: As discussed earlier, Read&Write is a robust tool, not only useful for supporting struggling readers, but also supporting struggling writers, with word prediction and speech-to-text capability. It works well with Google Docs, as well as other web-based text editors.

Intended User: Writers who struggle with attention and focus on writing assignments.

Cost: $12/annual license (min. 150 licenses)
$1.75/annual license (min. 350 licenses)

VoiceNote

Overview: VoiceNote is an online speech-to-text service and App for the Chrome browser. It features a simply designed interface and uses your computers built-in microphone. Files can be saved as ".txt" files for distribution.

Intended user: Writers struggling with idea generation, pace and rigor of writing.

Cost: Free

Word Prection

Word Prediction gives users the ability to define possible word choices once they begin typing. This is a powerful high tech tool because it gives writers who struggle with vocabulary, memory and recall, and spelling, the ability to write more quickly without having to pause and correct their work or think about what word(s) they are meaning to use.

Many of the top word prediction software on the market are quite expensive, so they are not being included in this guide. If

LightKey

Overview: LightKey is a Windows-based word prediction text editor. The power in this tool is that it works with Microsoft Word to allow for word prediction with any document that a user is working on.

Intended user: Writers struggling with spelling and vocabulary choice.

Cost: Free

Bibliography

Creating a bibliography can be a challenge for writers that struggle with organization, learning new styles of formatting, and memory. Many students are not accustomed to writing in the style of an academic writer, so generating a bibliography is a foreign concept. Not to mention that there are multiple styles, including MLA, APA, and Chicago style.

EasyBib

Overview: EasyBib is one of the best tools on the web for creating easy to use and easy to format bibliographic and citation entries for an essay or academic paper. For writers struggling with memory and formatting, EasyBib makes it easy; the user only need to know the important information about the text they are referencing. EasyBib does all of the formatting.

Intended user: Writers struggling with memory and organization.

Cost: Free

Graphic Organizers

A resource guide chapter on writing supports would be incomplete without discussing graphic organizers. Much has been published and disseminated on the web about graphic organizers, and there are potentially thousands of unique organizers available for purchase and download. The web has also made it easy to make your own graphic organizers, using simple and customizable graphics and text (a simple Google search of "graphic organizer maker" yields many possibilities). Find one or twenty, or make one, that suits your specific needs and keeps UDL in mind in service of struggling writers.

Physical Tools

With the modern emphasis on high-tech and new-tech tools, it is easy to forget from whence we came with AT to support writers. There are still many tools that are in use to support individuals with physical and motor impairments in their efforts to compose high quality hand-written work.

Though these tools are rapidly supplanted by high-tech peers there is still great power and utility in creating accessibility for these students.

Chapter 3: Math Tools

Math might be one of the most difficult disciplines to approach with AT because of the need to produce complex notation and solving equations, which often require a format and literacy beyond the comprehension of smart machines. That is now changing, but we can also look back to math as one of the earliest disciplines to feature AT (Hello, Abacus!).
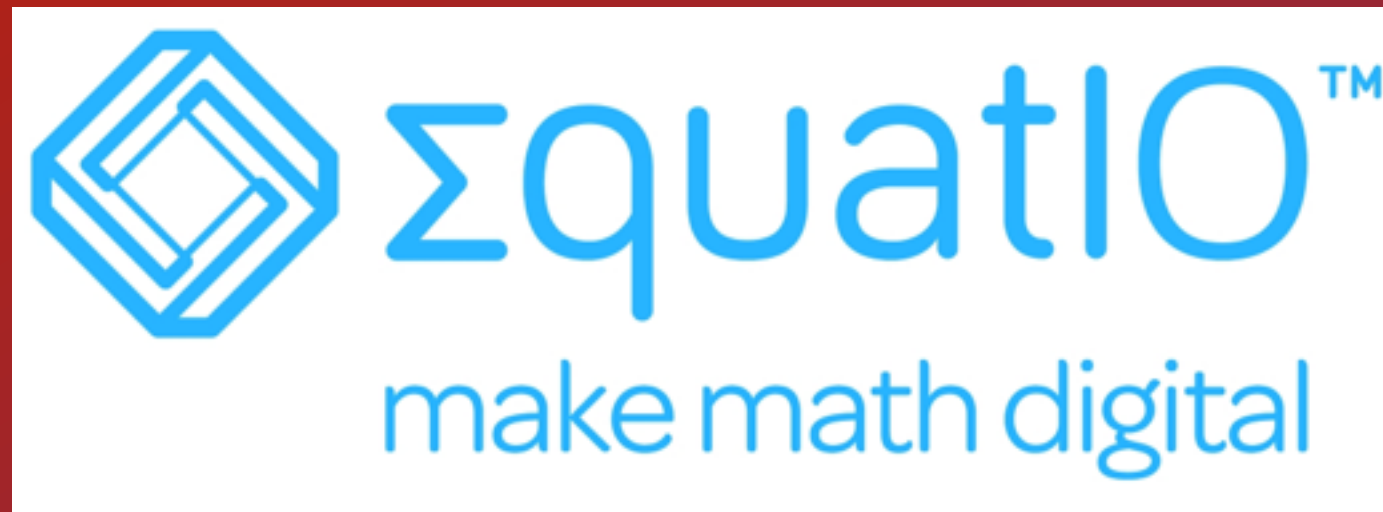
There are many online and offline tools we can find to help us perform all necessary math function, as well as learn and grapple with difficult content.

Math Notation

Math notation refers to the formatting and syntax of writing mathematics, which is often viewed as a great barrier to using technology in the field of mathematics, and creates a mental block in people's perceptions of their abilities as mathematicians. Now, there are some tools to help sort out the tricky world of math notation.
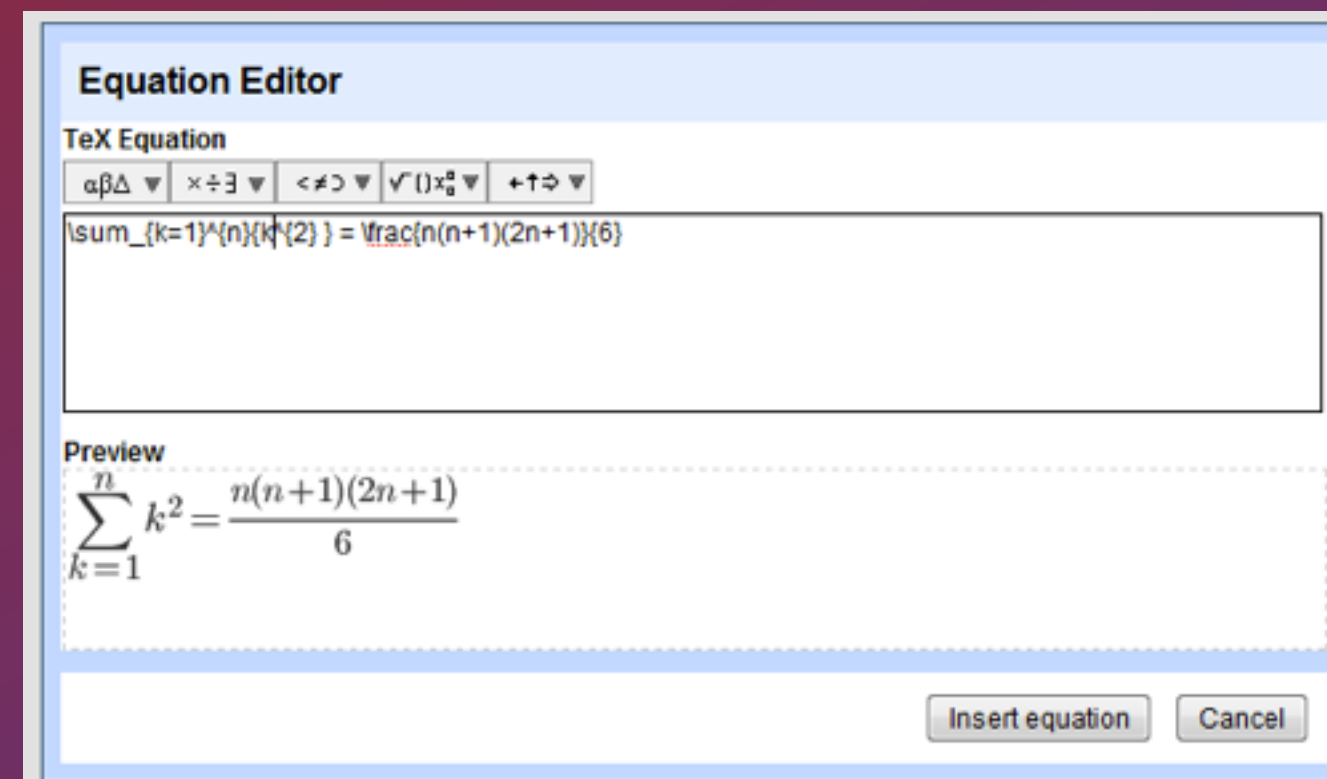
Equatio

Overview: By the creators of Read&Write, comes Equatio, a dynamic math editor, that is fully accessible and fully integrates with Google Docs. The beauty of Equatio is that you can input math notation using a mouse, using your finger, or a stylus. The software interprets what you are trying to "say" and makes it editable once it is in your document.

Intended User: Students that struggle with writing math notation, dyscalculia.

Cost: $10/annual license (min. 150 licenses) $1.00/annual license (min. 350 licenses)

Equation Editor (Google)

Overview: The equation editor in Google Docs is a fine tool that compares nicely with Equatio. The interface is very user friendly and easy to use. Users need to have a working knowledge of notation or the ability to translate notation from print to digital.

Intended User: Students that struggle with writing math notation.

Cost: Free

Calculation

In addition to notation, calculation might be the next greatest barrier to success for students staying engaged in and feeling confident in mathematics.

There are number of tools to help support students struggling to complete math computation, whether that be mental math or using paper-based computation strategies.

Wolfram Alpha

Overview: Wolfram Alpha is a dynamic web-based platform that performs simple and complex computation for a variety of maths (and other disciplines) concepts. You can search for specific concepts, browse their library or by topic, upload images, or type in an equation.

Intended User: Students struggling to comprehend math computation.

Cost: Free (Pro version available)

WebMath

Overview: WebMath is a help website which generates answers to math questions and problems. The website provides explicit instruction and direction on how the solution was achieved, so students can resolve how they got to a solution.

Intended User: Students struggling with multi-step computation, visualizing math.

Cost: Free

Calculators

Overview: Calculator, an invention often overlooked, but so appreciated by students. The first electronic calculators appeared in the 1960s (in US) and we have not looked back.

Intended User: Students who struggle performing long sequences of computation.

Cost: Varies (many free web-based calculators exists)

Graphing

Next in the line of important math skills is a students ability to graph. Graphs help students do a number of tasks; generate and interpret important information and data, solve complex computation and systems problems, and pose related sets of data points to find connections and establish relationships.

There are many tools to help us perform the function of graphing (fewer to help us interpret and read the graphs), as well as ancillary tools* (like the "ruler") to help us make graphs beautiful (*note: these tools will not be featured).

Geogebra

Overview: Geogebra is a web-based platform that allows students to interact with math in a number of ways: graphing, solving equations, creating constructions, analyzing data, and using 3D objects to explore new content. The graphing calculator is a web-based tool that allows a user to generate original graphs.

Intended User: Students with fine motor skill difficulty, students with graphing difficult.

Cost: Free

Desmos

Overview: Similar to Geogebra, Desmos is a web based graphing calculator. All that is required is an account and users can create beautiful graphs. There are demos for students and teachers. There is also an app.

Intended User: Students with fine motor skill difficulty, difficulty with standard graphing.

Cost: Free

Graph Paper

Overview: You remember this stuff? That's right, real graph paper, straight from the source. There is still nothing wrong with standard, traditional graph paper, a ruler, a compass, and a pencil (with a grip).

Intended User: Students with fine and gross motor coordination.

Cost: Marginal

Manipulatives

Manipulatives are a very important part of the math teacher arsenal. They are tools that can help any teacher make content feel more relevant, accessible, and approachable for tactile, kinesthetic, and visual learners alike. These can also be helpful for students with communication impairments engage with content.

(Virtual) Manipulatives

National Library of Virtual Manipulatives

Overview: The National Library of Virtual Manipulatives, from Utah State University, have compiled an excellent database of digital manipulatives that users can interact with on their computer screen. These tools provide excellent opportunities for a large math class with tactile and kinesthetic learners to access materials that may not available in person.

Intended User: Visual, kinesthetic, tactile learners.

Cost: Free

Chapter 4: Executive Functioning

Executive functioning affects many students those with and without disabilities. Many students are still developing the maturity to perform the skills necessary to maintain independence and become successful.

These tools are meant to help students with Organization, Focus & Attention, and Notetaking, though there are many other wonderful services and interventions that don't make use of technology.

Organization

A student's ability to stay organized goes beyond knowing where their homework lives. They need to now know where to keep documents, how to access them, how to share them, when assignments are due, how many assignments they have at any given time, when they are going to work on assignments, etc., etc., etc. The task can be exhausting for anyone, but especially for students that might have challenges related to a disability of ADHD, Autism, or processing disorder.

MyStudyLife

Overview: MyStudyLife is a wonderfully comprehensive app and web service, that students can use to manage and keep track of scheduling, tasks and due dates, and input reminders they have set for themselves. Everything is kept in one place for a simple and easy solution.

Intended User: Students with difficulty managing multiple systems.

Cost: Free (for students)

Google Keep

Overview: Google Keep allows students to create visual note pads and note boards for saving important information and organizing their academic and social lives. The notepads can be color coded, organized by similar topic or theme, and can sync with other Google apps.

Intended User: Students with memory deficits, with varied and busy lives.
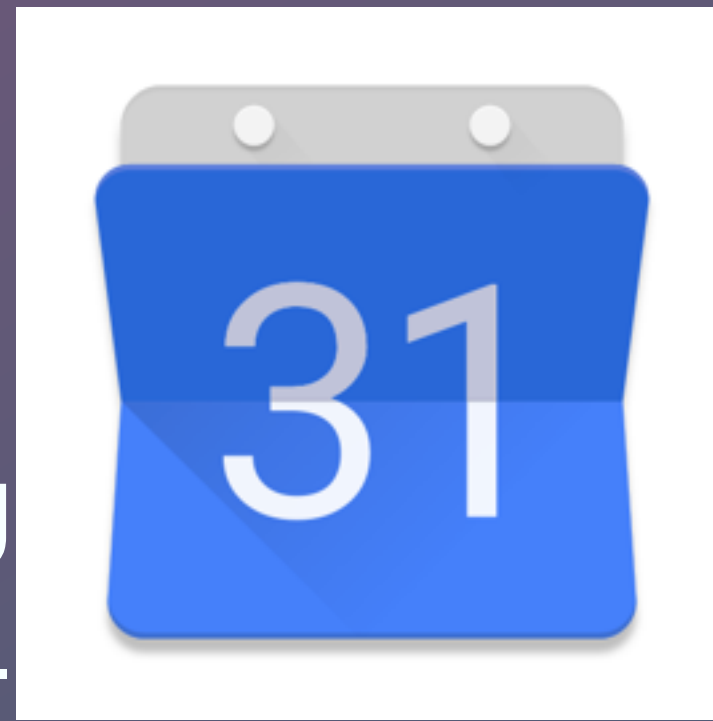
Cost: Free (Reqs Google account)

Google Calendar

Overview: Google Calendar is a simple to use calendaring app that is web-based & app-based. Users can keep track of and manage their schedules, create multiple calendars, send invitations to other users, and set reminders.

Intended User: Students with difficulty managing time and remembering schedule.

Cost: Free (Reqs Google account)

Daily Planner

Overview: Again, nothing wrong with the analog version here. For some students, a paper and pen version of a planner will fit their needs and learning preferences more suitably.

Intended User: Students with difficulty managing time and remembering schedule, who benefit from tactile stimulation.

Cost: Varies

Focus/Attention

Focus and attention difficulties can be a sign of maturity, or can be a deficit brought on by a disability. It is important to remember that all students are trying to do their best to remain focused and attentive in class.

The app featured next is one tool that can help. There are some additional tools featured later in this guide, as well as a number of non-AT related interventions to support focus and attention. Of course, one of the best ways to keep kids focused is to design engaging lessons.

Cold Turkey

Overview: Cold Turkey is one example of a growing number of apps and web-based tools that allow you to temporarily block distracting websites and online distractions allowing you to remain productive when you are engaging in web connectivity. You tell the service which distractions to block and for how long until you are done.

Intended User: Students with inhibition and impulse control difficulty.

Cost: Free (Premium version available)

Note taking

Note taking is perhaps one of the most important academic skills that students can master in order to be successful navigating the contemporary K-University school setting. There is an overwhelming amount of information to keep track of; content, assignment due dates, scheduling reminders, chores and routines. All of this requires copious attention to detail and retention of information. For many students struggling with executive functioning, these deficits are pronounced and note taking suffers.

Evernote

Overview: Perhaps one of the most well known note taking apps on the market, Evernote has been a leader in cloud-based and remote note taking and content storage. The service allows you to create notes, upload content from other platforms, including print and image, create tags to easily find notes, and many other categorizing features.

Intended User: Students who need remote access to notes and work between multiple machines.

Cost: Free (Premium plans available)

AudioNote

Overview: AudioNote is a exciting note taking app that allows users to pair written notes with recorded audio. The user tags notes they have taken in the app to an audio recording that is happening simultaneously. This allows for easy retrieval later on if you missed something that was said.

Intended User: Students with processing disorder, difficulty with memory.

Cost: Free (Premium upgrade available)

Sonocent Recorder

Overview: Sonocent Recorder records any piece of audio, notably lectures and presentations, and chunks the audio into manageable sections. These can be paired with visuals, including presentation slides, keyword tags, and other audio.

Intended User: Students with processing disorder, difficulty with memory.

Cost: $8.25/month

Microsoft OneNote

Overview: Microsoft OneNote is a new collaborative note-taking app for Microsoft users. The app is available for web, app, tablet, and computer download. Notes can be categorized by type, color coded, embedded with image, text, video, and audio.

Intended User: Students with difficulty with memory, visual learners.

Cost: Free (w/ Microsoft device)

Diigo

Overview: Diigo is a social bookmarking service that works as an extension through your web browser. The service allows users to bookmark webpages and content from any device, as long as they are logged in with their Diigo account. They can also annotate, organize, tag, and share their bookmarks with users all over the web.

Intended User: Students with difficulty with memory.

Cost: Free

Chapter 5: Communication

Communication is key in the classroom. So much of a student's unmet needs and wants are as a result of communication breakdowns between communication partners (eg: student-peer, student-adult).

There are a number of ways to introduce new communication devices and tools to students that struggle with communication. For severely impacted learners, alternative and augmentative communication (AAC) might be a solution. For others with speech capacity, a social story might be necessary.

AAC

Alternative and Augmentative Communication tools are a burgeoning new field within the AT world that allow users and practitioners the ability to dialogue using a computer- or digital-aided device. The tools has a pre-loaded series of words, images, and sounds, that correspond to buttons, which, when pressed, speak a word. This is especially helpful for individuals with a significant physical impairment that impacts their ability to create speech sounds using their natural voice.

Verbally

Overview: Verbally is one example of many AAC apps and devices. Many range in price, but Verbally exists in a more reasonable price range. It features a simple interface, with color coded buttons, libraries of commonly grouped words, word prediction, and large buttons. Students with strongly developed literacy skills will benefit from this app.

Intended User: Student with physical impairment impacting speech sounds.

Cost: Free (In-app purchases)

PECS

Overview: Picture Exchange Communication System (PECS) is a type of communication board that can be created using analog materials (see above) or created digitally (see Google). Rows and columns of "buttons" profile an image and word to teach basic literacy to emerging learners and speakers. Presents a nice introduction before introducing AAC.

Intended User: Students in pre-literacy phase of communication, students with physical impairment.

Cost: Varies

Social Stories

Overview: Social stories are excellent tools to teach students with limited innate pragmatic communication skills to operate and exist within the expectations and norms of a school or classroom space. Social stories can be downloaded, created by an SLP or teacher, or made in collaboration with a student.

Intended User: Student with pragmatic communication impairment.

Cost: Varies

When someone is hurting or annoying me I will:

1. Look at them.

2. Put my hand up in a 'stop' sign.

STOP 3. Say to the person, "Stop it, I don't like it."

4. If it doesn't work I will get help from a teacher.

Visual Schedule

Overview: A visual schedule is a graphic representation of a students schedule and expected routines for any period of time they are in a classroom. These can be created using analog materials or digital materials are helpful for students who have mobility, but have limited communication, to regulate behavior and set norms.

Intended User: Students with mobility and limited oral communication.

Cost: Varies

Morning Routine

6:15 am Wake Up ✓
6:20 am Feed & Water Dog ✓
6:25 am Make Bed ✓
6:30 am Brush Teeth/ Wash Face
6:35 am Brush Hair
6:40 am Get Dressed
7:00 am Take Medication
7:10-7:20 am Get on Bus

Chapter 6: Behavior

Sensory stimulation and regulation are vitally important for a student to effectively function in their academic environment. Every learner, whether they have a diagnosed disability or not, has a sensory need that must be met in this world. For some learners, these needs are met very easily; a student gets up, takes a walk around the carpet and sits back down. For others, these needs are more difficult to regulate, control, and sometimes, more difficult to satisfy. Developing effective supports and strategies can help learners focus and stay engaged and on task, and reduce problem behavior.

Wiggle Seat

Overview: The Wiggle Seat is a type of sensory device that students can put on their chair, to help regulate movement, while they are sitting down. The added bumps also help children who require tactile stimulation.

Intended User: Students who struggle with sensation seeking and require movement to focus.

Cost: Varies

Fidgets

Overview: Fidgets are an excellent source of sensory stimulation for children and adults of all ages. The debate about so-called "fidget spinners" has not escaped the consciousness of educators across the nation, but fidgets are research-based solution for children with difficulty in focus and attention.

Intended User: Students that struggle with focus and sustained attention.

Cost: Varies

Yoga Balls

Overview: The Yoga Ball is a tool that can replace the standard hard-backed chair that many students find difficult for sustained sitting. The benefit of the yoga (or stability) ball is that students benefitting from movement can attain that sensation at their seat, while maintaining engagement and focus in the day's lesson and activities.

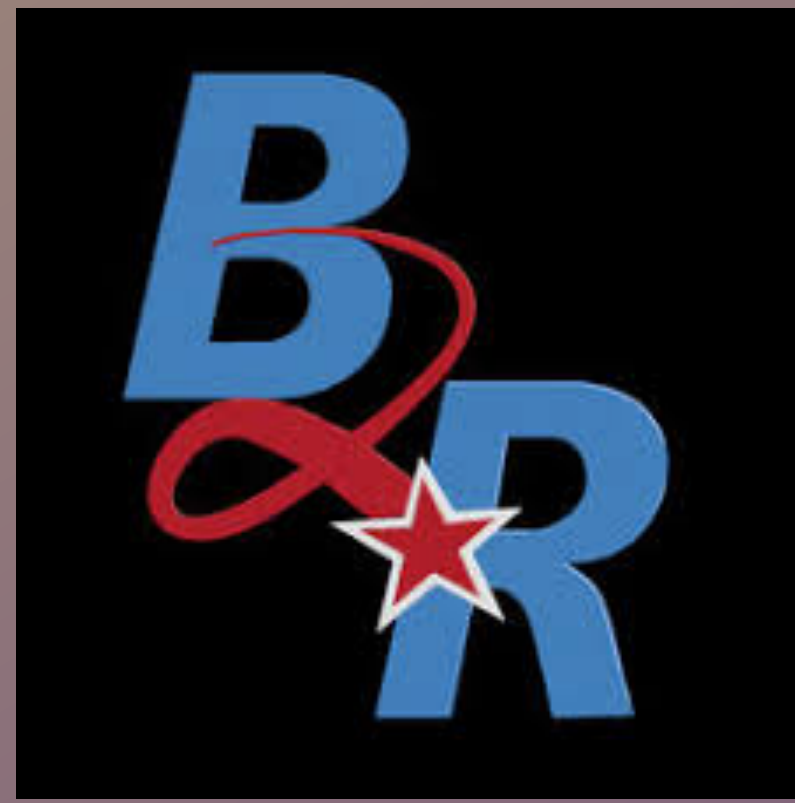Intended User: Students who require movement to focus.

Cost: Varies

Meditation App

Overview: There are many wonderful meditation apps on the market to help students develop healthy stress reduction techniques and skills, for use when they are feeling overwhelmed, anxious, and/or depressed. These apps do not replace services, like counseling, but can be a quick intervention to help redirect a student back into the classroom.

Intended User: Students struggling with emotional regulation and stress.

Cost: Varies (Breathe2Relax app: Free)

Timers

Overview: Timers can serve many purposes in a classroom: to give breaks, to help students know how long they have to work, to indicate transitions between assignments. For students with difficulty regulating behavior, the timer can be your friend.

Intended User: Students who experience difficulty with self-regulation.

Cost: Varies; Digital Timers exist on the web for free