



# Accessing Complex Text for Students With Disabilities: Technology Purchasing Checklist



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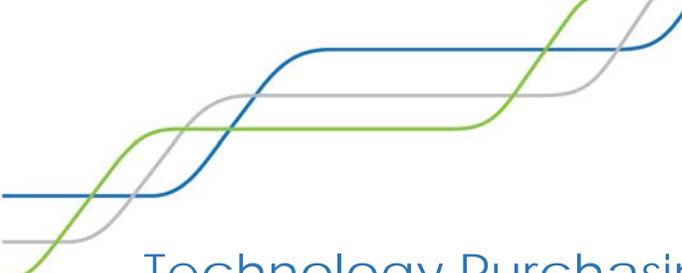
## Why Is Complex Text Important?

One key requirement for academic success is students' ability to comprehend text of increasing complexity as they progress through school (Fitzgerald et al., 2015). To be successful after graduation, students need to be able to read and comprehend, independently and proficiently, the kinds of **complex texts** commonly found in college and the workplace. "To put the matter bluntly, a high school graduate who is a poor reader is a postsecondary student who must struggle mightily to succeed" (Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Sciences, and Technical Subjects, n.d., p. 3).

As states implement more rigorous college and career readiness standards, school leaders must consider how students with disabilities will meet these standards. To address these needs, educators can use new educational and assistive technologies (AT) to ensure that students with disabilities are able to develop their reading skills and successfully comprehend **complex texts**.

## Technology Tools Can Help Support Students With Disabilities

How do schools and districts make informed decisions and choices to support teaching and learning? The following checklist, designed to meet the needs of educators at all levels, provides an easy-to-use guide for making purchasing decisions. It identifies key considerations when deciding how to align curriculum goals that foster student access to text through sensory, physical, visual, cognitive, and developmental supports. Words in bold are defined in the glossary at the end of the document.



# Technology Purchasing Checklist for Digital Text Supports

## Sensory Access

- Ensure that users can adjust text and font size, text color, and screen background easily
- Caption images and media to provide blind or deaf students with access to content
- Ensure that classroom content is 508-compliant and easily modifiable
- Represent content in multiple ways so that students can access it in a variety of ways

## Physical Access

- Create **usable** and **accessible** text for students using a screen reader
- Ensure that text, content, and programs are **accessible** for students unable to operate a standard keyboard or mouse
- Ensure access to handheld devices for students struggling to read individual words
- Integrate the use of pictures/symbols with text through the technology provided
- Provide teachers with the ability to readily utilize **modified electronic text** through the technology provided
- Utilize technology with text readers, especially those with built-in study skills supports, **optical character recognition**, scanners, and text readers
- Consider the capacity of the district's infrastructure to provide appropriate assistive technology (AT) devices for all schools with qualifying students

## Developing Background Knowledge

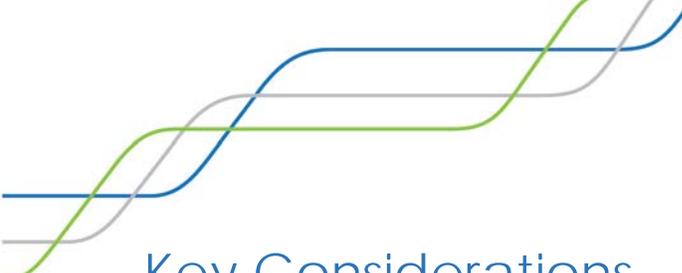
- Use technology to facilitate a simplified presentation or overview of topics to help students build background knowledge
- Highlight key vocabulary that can be identified and defined through the technology provided

## Cognitive Access

- Ensure that students have access to text-to-speech technology
- Use technology to access similar texts of varying complexity and reading levels
- Modify content for students who struggle with reading grade-level text
- Enhance the presented curriculum such that content is predictable, coherent, and logical through the technology provided
- Assist students in **scaffolding** complex information through the technology provided
- Provide English language learners with support to access text or definitions in their native language
- Engage students through interesting texts and technical solutions

## Visual Access

- Caption or describe visual supports to ensure **accessibility**
- Provide graphic organizers in a digital format



## Key Considerations

### Funding

- Ensure the individualized education program (IEP) process factors into AT purchasing decisions
- Collaborate across departments and/or agencies to better utilize funding for technology purchases
- Fund **accessibility** proactively

### Utilizing Existing Technology

- Define AT in your state
- Identify types of adaptive equipment students with disabilities already use
- Integrate education technology with assistive and **adaptive technologies**
- Identify who ensures classroom content meets **accessibility** standards

### Curriculum

- Consult with standards leaders and special educators on aligning technology and curriculum
- Ensure teachers have sufficient training and support to integrate technology into lesson plans and the curriculum
- Consider universal design features that address the needs of at-risk students who could benefit from technology-based **accessibility**
- Create a computer-based curriculum for general education that is compatible with **adaptive technology**

### Purchasing

- Consider the rapid rate of change across devices and platforms
- Include language about **accessibility** in your purchasing contracts
- Take advantage of trial periods to ensure that technologies meet the needs of students

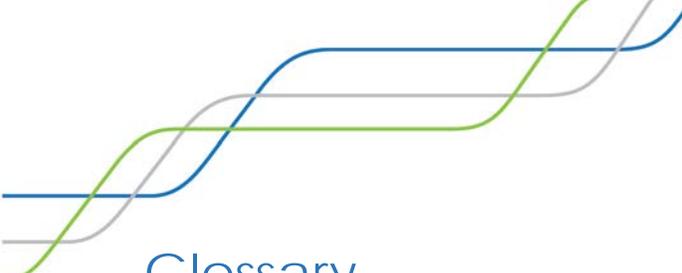
- Work with vendors who offer an extended support plan and will provide technical assistance to your school

### Implementation

- Deliver trainings on using technology to support instruction and/or **accessibility to complex texts**
- Identify effective implementation practices
- Designate staff to provide coaching to teachers and disseminate information
- Identify libraries in your state and schools that provide **accessible** text through e-readers
- Identify ways to improve your state's technology infrastructure and think about how will it increase your state's capacity to support LEAs
- Identify stakeholders to include in developing and sustaining a comprehensive AT plan

### Legislative Requirements

- Comply with guidance from the **National Instructional Materials Accessibility Standard (NIMAS)** established under the Individuals with Disabilities Education Act (IDEA)
- Train LEAs and teachers on how to access materials through **National Instructional Materials Access Center (NIMAC)**
- Monitor compliance with IDEA's mandate to provide **accessible instructional materials (AIM)** to students with disabilities
- Establish criteria for reviewing **accessible** materials to ensure they align with state and federal standards



## Glossary

**Accessible/Accessibility:** Accessibility refers to the way that products, devices, services, or environments are designed for people with disabilities. The purpose of accessible design is to provide compatible direct and indirect access to a person's assistive technology (e.g., with a computer screen reader).

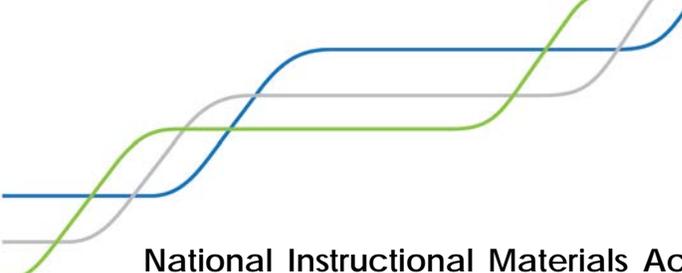
**Accessible instructional materials (AIM):** IDEA requires school districts to provide accessible versions of instructional materials to students who are disabled and unable to otherwise use printed materials. Students with disabilities should receive materials in accessible formats that include Braille, large print, audio, and digital text.

**Adaptive technology:** Adaptive technology is any system that is designed to increase or maintain the capabilities of people with disabilities.

**Complex text:** Several components of a text can lead to text complexity. Quantitative measures, such as readability levels that consider semantic difficulty and sentence complexity, can indicate a challenging text. Qualitative measures of a text, such as levels of meaning, purpose, or textual features, also can determine complexity.

**Modified electronic text:** Modified electronic text refers to electronic text that becomes flexible and can be reformatted or transformed into accessible alternative formats. For example, text can be enlarged, the format can be adjusted with more spacing between words or lines, or text can be presented in high contrasting colors to make it easier to see. Once text is in a digital format, it can be read on the computer, word definitions can be spoken, or students can click on embedded links to increase understanding.

**National Instructional Materials Access Center (NIMAC):** NIMAC is the repository where all of the NIMAS (see below) files are stored. It is funded by the Office of Special Education Programs (OSEP) and was created through amendments adapted to IDEA. The purpose of NIMAC is to facilitate districts' distribution of materials for students with disabilities. Once a NIMAS file is downloaded from NIMAC by an authorized user, it must be converted to the required accessible format for the student. NIMAC primarily houses files for materials published for use in elementary and secondary school instruction.



**National Instructional Materials Accessibility Standard (NIMAS):** NIMAS is a technical specification, endorsed by the U.S. Department of Education, which publishers must use in preparing files. NIMAS files are then sent to NIMAC, as requested by a school district.

**Optical character recognition:** Optical character recognition is a technology that converts different types of documents, such as scanned paper documents, PDF files, or images captured by a digital camera, into editable and searchable data.

**Scaffolding:** Scaffolding is the support given during the learning process, typically by someone with higher skills, which is tailored to meet the needs of the student, with the intention of helping the student achieve a learning goal.

**Usability:** Usability refers to the effectiveness, efficiency, and satisfaction with which users can achieve a set of tasks in a particular situation. Usability also refers to how users can learn to operate a product and remember how to do so when they return to the product at a later time.



## References and Resources

Abbyy. (n.d.). *What is OCR and OCR technology?* Retrieved

from [http://www.abbyy.com/finereader/about-ocr/what-is-ocr/?\\_sm\\_au=iVV0DqsJnDTf2jWQ](http://www.abbyy.com/finereader/about-ocr/what-is-ocr/?_sm_au=iVV0DqsJnDTf2jWQ)

*Common Core State Standards for English language arts & literacy in history/ social studies, sciences, and technical subjects. Appendix A: Research supporting key elements of the standards.* (n.d.). Retrieved

from [http://www.corestandards.org/assets/Appendix\\_A.pdf?\\_sm\\_au=iVVf2wtT40PtV52N](http://www.corestandards.org/assets/Appendix_A.pdf?_sm_au=iVVf2wtT40PtV52N)

DO-IT, University of Washington. (n.d.). *Glossary of disability-related terms: Accessible.*

Retrieved from [http://www.washington.edu/doit/glossary-disability-related-terms?\\_sm\\_au=iVV0DqsJnDTf2jWQ](http://www.washington.edu/doit/glossary-disability-related-terms?_sm_au=iVV0DqsJnDTf2jWQ)

DO-IT, University of Washington. (2015). *What is the difference between accessible, usable, and universal design?* Retrieved

from <http://www.washington.edu/doit/what-difference-between-accessible-usable-and-universal-design>

Ferry, M. (2012). *10 items every special educator should have in their classroom.*

Retrieved from <http://www.friendshipcircle.org/blog/2012/11/20/10-items-every-special-educator-should-have-in-their-classroom>

Fitzgerald, J., Hiebert, E. H., Bowen, K., Relyea-Kim, E. J., Kung, M., & Elmore, J. (2015).

Text complexity: Primary teacher's views. *Literacy Research and Instruction*, 54(1), 19–44.

Georgia Tech Tools for Life. (n.d.). *What is assistive technology?* Retrieved

from [http://gatfl.org/assistive.php?\\_sm\\_au=iVVBS0MpSBZJ43Vn](http://gatfl.org/assistive.php?_sm_au=iVVBS0MpSBZJ43Vn)

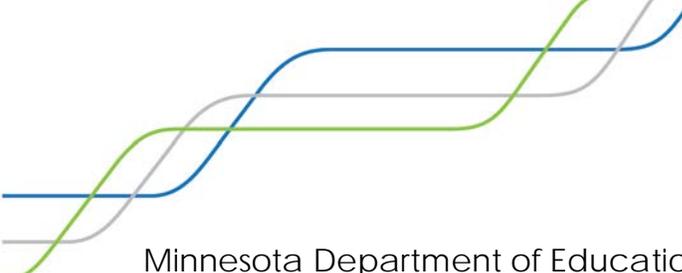
Henry, S. L., & Abou-Zahra, S. (2017). The role of accessibility in a universal web. *W4A '14 Proceedings of the 11th Web for All Conference.*

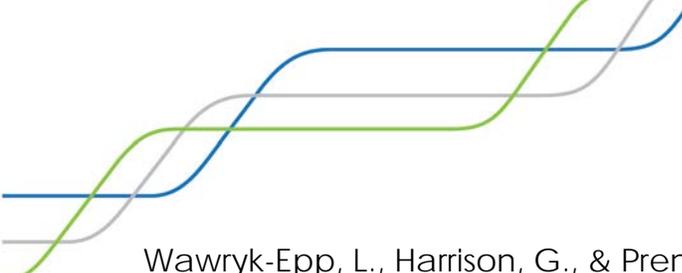
Hidden curriculum. (2014). In S. Abbott (Ed.), *The glossary of education reform.*

Retrieved from <http://edglossary.org/hidden-curriculum>

Minnesota Department of Education. (2015). *Accessible instructional materials: Guidance for purchasers of learning materials.* Retrieved

from <http://education.state.mn.us/MDE/EdExc/SpecEdClass/AccessInstruc/004148>

- 
- Minnesota Department of Education. (2014). *What are accessible digital learning materials?* Retrieved from <http://education.state.mn.us/MDE/EdExc/SpecEdClass/AccessInstruc/058316>
- Nankee, C. (2009). *Modified electronic text: Microsoft Office 07*. Retrieved from [https://cindyankee.wikispaces.com/file/view/Modified+Electronic+Text+office+07-activity+document.pdf?sm\\_au=iVVqFnjTDV00pnmM](https://cindyankee.wikispaces.com/file/view/Modified+Electronic+Text+office+07-activity+document.pdf?sm_au=iVVqFnjTDV00pnmM)
- National Center for Technology Intervention and the Center for Implementing Technology in Education (in collaboration with AbleNet, Inc.). (n.d.). *Consumer guide: Buying assistive and learning technologies*. Retrieved from <http://techmatrix.org/sites/all/themes/TechMatrix/images/consumerguide.pdf>
- Neff, J. (n.d.). Strategy guide: Promote deep thinking! How to choose a complex text. *Readwritethink*. Retrieved from [http://www.readwritethink.org/professional-development/strategy-guides/promote-deep-thinking-choose-31023.html?sm\\_au=iVVqFnjTDV00pnmM](http://www.readwritethink.org/professional-development/strategy-guides/promote-deep-thinking-choose-31023.html?sm_au=iVVqFnjTDV00pnmM)
- NYSED. (2015). *Accessible Instructional Materials (AIM)*. Retrieved from [http://www.p12.nysed.gov/specialed/aim/?sm\\_au=iVVqFnjTDV00pnmM](http://www.p12.nysed.gov/specialed/aim/?sm_au=iVVqFnjTDV00pnmM)
- Reed, P., & Walser, P. (2000), adapted from Lynch & Reed (1997). *Wisconsin Assistive Technology Initiative assistive technology checklist*. Retrieved from [http://www4.esc13.net/uploads/assistivetech/docs/ConsideringAT/AT\\_Consideration\\_Checklist\\_WATI.pdf](http://www4.esc13.net/uploads/assistivetech/docs/ConsideringAT/AT_Consideration_Checklist_WATI.pdf)
- Tennessee Science Standards – Grades 6, 7, & 8*. (2015). Retrieved from [file:///H:/share/IDEA%20ACDM\\_MATO%202014-19/Task%204%20Meetings/Subtask%204B%20Annual%20Virtual%20Meeting/2016%20Virtual%20Leadership/Presenter%20Resources/AAT\\_v4.pdf](file:///H:/share/IDEA%20ACDM_MATO%202014-19/Task%204%20Meetings/Subtask%204B%20Annual%20Virtual%20Meeting/2016%20Virtual%20Leadership/Presenter%20Resources/AAT_v4.pdf).
- U.S. Department of Health and Human Services. (2015). *PDF file 508 checklist*. Retrieved from <http://www.hhs.gov/web/section-508/making-files-accessible/checklist/pdf/index.html>
- U.S. Department of the Interior. (2007). *Guide to creating accessible portable document files (PDF)*. Retrieved from [https://www.doi.gov/sites/doi.gov/files/migrated/ocio/information\\_management/upload/Guide\\_for\\_Creating\\_Accessible\\_Documents.pdf](https://www.doi.gov/sites/doi.gov/files/migrated/ocio/information_management/upload/Guide_for_Creating_Accessible_Documents.pdf)



Wawryk-Epp, L., Harrison, G., & Prentice, B. (2004). *Teaching students with reading difficulties and disabilities: A guide for educators*. Retrieved from <http://www.education.gov.sk.ca/reading-difficulties-disabilities>

Web Accessibility Initiative. (2012). *Operable user interface and navigation*. Retrieved from [http://www.w3.org/WAI/intro/people-use-web/principles?\\_sm\\_au\\_=iVV0DqsJnDTf2jWQ#operable](http://www.w3.org/WAI/intro/people-use-web/principles?_sm_au_=iVV0DqsJnDTf2jWQ#operable)

WebAIM. (2013). *Constructing a POUR website: Putting people at the center of the process*. Retrieved from <http://webaim.org/articles/pour/operable>