Spreading "The Word" about Cognitive Rescaling as a Tool for Inclusion

By Sally Norton-Darr and Judith Schoonover

SALLY NORTON-DARR, MS, CCC-SLP, (left) is an assistive technology trainer for Loudoun County Public Schools in Virginia, as well as a nationally certified speech-language pathologist. She has presented internationally, regionally and virtually to diverse audiences on a wide range of low-,mid- and high-tech strategies, interventions and solutions. Sally is the also the co-author of the ISTE publication: The Practical (and Fun) Guide to Assistive Technology in Public Schools. Sally.NortonDarr@LCPS.org

JUDITH SCHOONOVER, MEd, OTR/L, ATP (right) is an occupational therapist and former elementary school teacher. She is certified as an AT practitioner by RESNA and is a founding member of the Loudoun County (VA) Public Schools AT team. Judith has worked in schools for more than 35 years, publishing and presenting on the topics of school-based occupational therapy, transition and assistive technology. She is the vice president of the Virginia Occupational Therapy Association and has served as the communication liaison for the American Occupational Therapy Association Early Intervention and School Special Interest Section. Judith is a member of AOTA's RTI and Transition Task Forces, and an AOTA Representative to the National Joint Committee for the Communication Needs of Persons with Severe Disabilities (NJC).

> "Warren pushes up his glasses, and like his classmates, hunches over the book on his desk. Using his finger to track across the page, his lips purse as he encounters an unfamiliar word.
>
> "O.K., class, close your books," his teacher announces, "let's discuss the chapter. Why do you suppose John Wilkes Booth shouted, "Sic Semper Tyrannis" after assassinating Abraham Lincoln?" Warren fingers his copy of Clifford the Big Red Dog and looks puzzled."

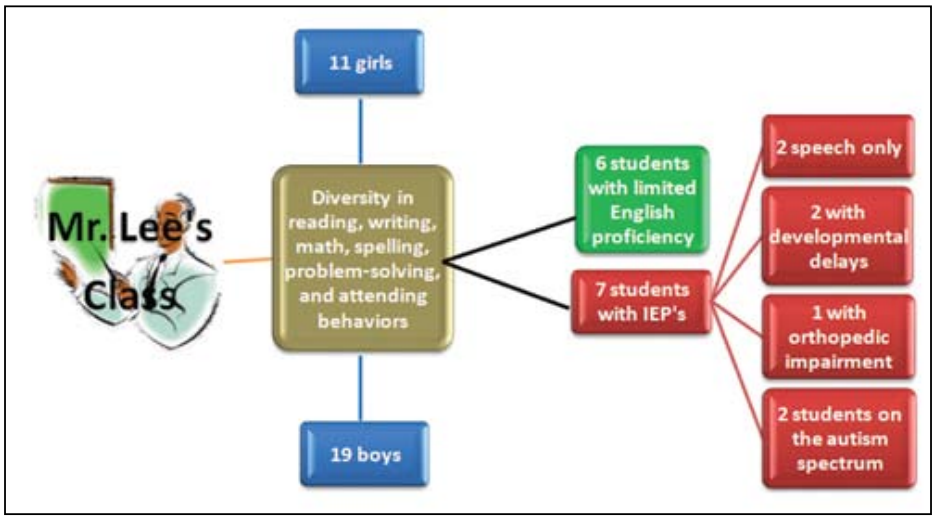
Have you seen a learner like Warren at your school, a learner who is included only in the sense of sharing physical space with his/her classmates? Inclusion is intended as commitment to educate each learner, to the maximum degree possible, in the school and classroom s/he would typically attend, and should not end with placement in a "regular" classroom, but rather begin with opening the doors to participation as a member of the classroom and school community. Hopefully, the practice of inclusion in physical presence only is becoming the exception rather than the norm.

Speaking of exceptions, it is a rarity in this day and age that a classroom is comprised of learners with the same ethnicities, life experiences, learning styles and more. Take Mr. Lee's class for example; his classroom is made up of 19 boys, 11 girls, six learners who are English language learners, seven learners with IEPs (two speech only, one learner with orthopedic impairments, two learners on the autism spectrum and two with developmental delays).

Like most of the United States, the state in which Mr. Lee teaches has adopted the Common Core Standards. An excerpt from a white paper written on the Common Core State Standards and the impact on access to the general education curriculum for learners with disabilities reads as follows:

"To ensure meaningful and complete participation and success in the general education curriculum for learners receiving special education services, the developers of the Common Core State Standards suggest additional supports and services be provided, as needed. They include:

- instructional strategies based on the principles of Universal Design for Learning (UDL). These strategies support student engagement by presenting information in multiple ways and allowing for students to access and express what they know in a variety of ways.
- accommodations, including changes in materials and/or procedures. An important consideration is that these accommodations should not alter the standards nor lower the expectations for learners to successfully accomplish the work.
- assistive technology devices and services to enable access to the standards."



Schematic of Mr. Lee's class (SmartArt)

With learners like Warren in mind, in 1996, David Yoder, Karen Erickson and David Koppenhaver, working at the Center for Literacy and Disability Studies at the University of North Carolina, co-authored a Literacy Bill of Rights, which began with the statement that "all persons, regardless of the extent or severity of their disabilities, have the basic right to use print." Right number six is "the right to have teachers and other service providers who are knowledgeable about literacy instruction methods and principles. Methods include but are not limited to instruction, assessment and the technologies required to make literacy accessible to individuals with disabilities. Principles include, but are not limited to, the beliefs that literacy is learned across places and time, and no person is too disabled to benefit from literacy learning opportunities."

How can cash-strapped school districts empower their service providers to make this happen? Let's start with UDL. Did you know that the difficulty of information can be altered to address each pillar of the Universal Design for Learning, UDL (CAST, 2011) using MS Word and free Internet downloads? It is possible to break out of the one-size-fits-all mentality of curriculum, instruction and assessment, using digital technologies that alter the cognitive difficulty of information to provide multiple means of representation, action and expression, and engagement. In 2002, Edyburn coined the term "cognitive rescaling," defining it as "a process of altering the cognitive difficulty of information," changing the "cognitive challenge in understanding the information." Using tools already available in most school districts, such as Microsoft Office features, in novel ways, curriculum and instruction can be designed or transformed with scaffolds and supports embedded to ensure that all learners have access to knowledge. Every educator can produce technology-enhanced digital text with readily available software and free Internet downloads. Learners can also be taught to alter the amount, cognitive challenge and appearance of text as a form of self-advocacy using common MS Office features.

Arguably, the most critical obstacle to individualizing instruction is the "one size fits all" aspect of traditional print-based curriculum, which presents significant barriers for learners with sensory or motor disabilities, learners with low cognitive abilities, those with attentional and organizational problems and those with learning disabilities (Stahl, 2004). Traditional teacher-created "fixes," such as recording textbook chapters for learners with grade level auditory comprehension, highlighting the key points to focus attention on essential facts and vocabulary, or sitting with a learner to read and discuss the text together (Edyburn, 2002), meet some needs, however, the overall outcome may be fragmented and individualized to the point of teacher burnout and learner disengagement.

Enter UDL, a set of principles for designing curriculum that provides all individuals with equal opportunities to access information. Based on research of learner differences and effective instruction, UDL advocates for varied and flexible ways to represent content (the "what" of learning), plan and execute learning activi-

ties (the "how" of learning) and achieve and maintain learner engagement (the "why" of learning). Providing information in a variety of modalities (visual, oral, auditory and textual) can help educators reach a wider and more diverse audience. Differentiating instruction means accommodating these differences by tailoring teaching to learners' strengths and knowledge.

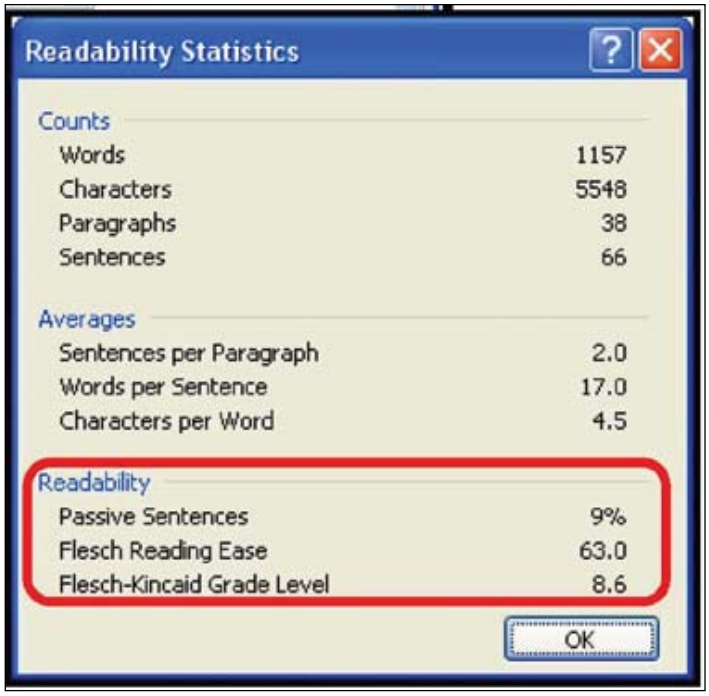
Changing the cognitive difficulty of information using digital technologies can engage learners, resulting in higher levels of academic achievement. Providing materials and tasks of varied levels of difficulty, along with supports, to multiple instructional groups and allowing learners to work in modes that are most successful for them (e.g., alone or collaborative, auditory or visual, practical or creative) (Tomlinson, 2001) gives learners multiple options for taking in information, for making sense of ideas and for expressing what they learn. Low-tech to high-tech resources that most schools already have on hand can be used to facilitate this kind of tailored instruction. Simple graphics software and word processors, as well as resources and tools found on the Internet, offer learners a variety of ways to access content, work with information to develop understanding and demonstrate what they know. Regardless of the source of the original text, to make the curriculum accessible, it is essential to obtain the information in a digital format.

Here's how Mr. Lee approaches the challenge of teaching his diverse group of learners: he thinks about methods in which his learners can see, hear and interact with text and looks for vehicles to provide access and equity, beginning with the resources and materials he already has. By viewing low-tech to high-tech classroom tools, such as interactive whiteboards, computer software, manipulatives, magnetic strip card readers and the Internet through, "a UDL lens", he is able to determine a number of ordinary supports that could be used in extraordinary ways to circumvent barriers using the principles of multiple means of representation. Mr. Lee knows that with the influx of a vast variety of productivity tools, it is now possible to design or transform curriculum or instructional methodology with the scaffolds and supports needed to ensure that all learners have access to knowledge. This practice is also referred to as "scaffolding." Scaffolding provides what might be a temporary assistive component to instructional material or methods in order to assist a learner in understanding or completing a learning task successfully and is intended to be removed if/when when mastery is achieved (CAST, n.d.). To begin the scaffolding process, Mr. Lee acquires digital versions of the information he needs to convey, using resources, such as textbooks, CDs, topic-related websites, etc. He is aware that the Chafee Amendment was passed to facilitate the creation of accessible formats of print materials for the benefit of students with disabilities. He then pastes the text in sections into MS Word in order to check the readability of the text.

READABILITY

A revealing and yet hidden tool in an intervention arsenal is the readability scale built into Microsoft Word. When "Show Readability Statistics" is selected from the Proofing section of Word (2007) Options, a dialogue box is revealed at the completion of Spell Checking, which indicates the Flesch Reading Ease (higher scores indicate material that is easier to read) and Flesch-Kincaid Grade Level.

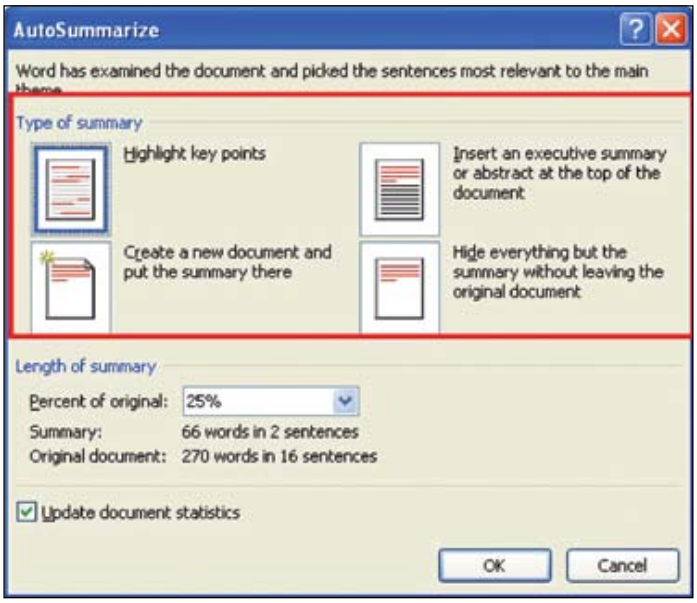
Determining the readability of the text validates Mr. Lee's belief that the text, in its original format, may be above the reading level of at least one third of his learners. While he is aware that screen readers are available to "read" the text to his learners, there are some learners who would be unable to comprehend the content in its present form and others who would become overwhelmed with the volume of the text and simply "shut down." So next, Mr. Lee decides to use the AutoSummarize feature, available in versions of MSWord up until the latest one, Word 2010.



Determining Readability Statistics through Microsoft Word [A web-based tool is available at http://bit.ly/webreadability]

AutoSummarize is a tool present in less recent versions of MSWord (up to and including Word 2007) http://office.microsoft.com/en-us/word-help/automatically-summarize-a-document-HA010255206.aspx AutoSummarize identifies the key points in a document and is most effective on well-structured non-fiction, such as textbooks.

A similar, more flexible, free Web-based tool can be found at www.TextCompactor.com. With these tools, one can reduce the length of the text to a percentage of its original. Caution should be taken to recheck readability at this point, and as often as needed. Adjusting the sentence length and paraphrasing or making alternate word choices using right-click synonyms will scaffold the cognitive level of the text to meet the reader's ability.



An executive summary is available through Microsoft Word [A web-based tool for this can be found at TextCompactor.com]

Now Mr. Lee can think about his learners' learning styles to determine how to further enhance the text by considering the following individualized options for visual, auditory and access needs.

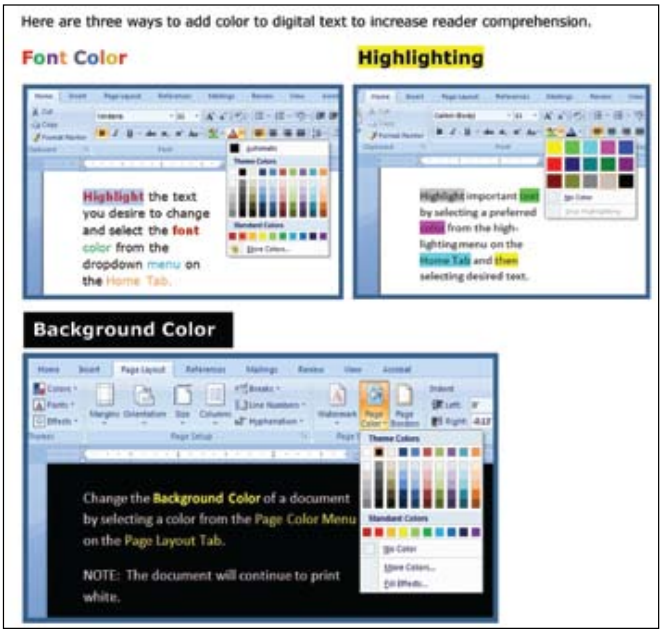
VISUAL

Color: Whenever possible, users should be allowed to select their own choice of font style and size, background and print colors. These options are readily available in MS Word and color can make a difference. Additional guidance and resources on the impact of color can be found at Judi Sweeney's website: http://www.onionmountaintech.com/click.php?id=8

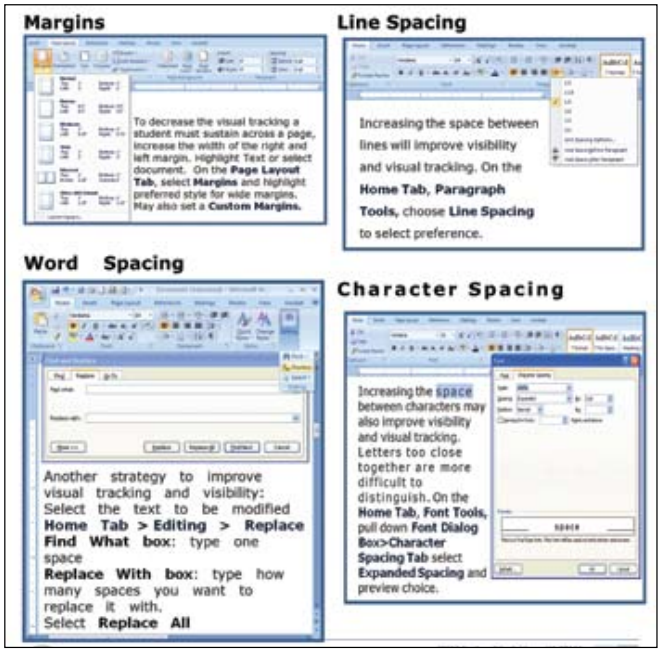
Spacing: Similarly, spacing between character, words, lines of text and in margins can impact a reader's ability to more easily access print and should be a personal choice or one demonstrated and presented to learners.

Don't underestimate the importance of highlighting key text in a meaningful way, such as larger text font, underlining, bold and highlight, again a personal preference. Find additional resources from the British Dyslexia Association: http://www.bdadyslexia.org.uk/about-dyslexia/further-information/dyslexia-style-guide.html

Images: Alternative formats of text may also be considered, such as crystallizing the important information into a mini-book (pocket mod) or table where graphic or picture supports may play a bigger role. The use of graphics and images cannot be stressed enough in increasing comprehension and retention of concepts and information for those with that particular learning preference. The Internet readily provides a source of images, graphics and video supports for most curricular topics. Additionally, the increased popularity of graphic novels emphasizes the role comic strip generators (such as bitstrips.com) can play in curricular topics. These can be teacher- or student-made and often help learners who are creative, yet feel they are limited in talent, to make a statement demonstrating and summarizing their knowledge of the subject at hand. Video support of text can be found on many textbook publishers' websites, YouTube, and TeacherTube.



Color changes can make a difference!



Spacing can have an impact on readability.

AUDITORY

Presenting learners with the ability to listen to curricular material can increase engagement and comprehension, particularly when the learner's auditory comprehension levels are taken in to consideration. This can be accomplished in a variety of ways. The text, or portions of the text, can be read or paraphrased and made available through yet another disappearing Microsoft Tool.

Some versions of Microsoft Word offer the ability to Insert Voice Recordings as text objects.

One of Mr. Lee's favorite tools is to insert voice comments into MS Word documents.

Learners can listen to Mr. Lee or other students discuss the curricular topic. There are a variety of free text-to-speech tools available, but the personal touch can also be added by voice recordings made with a free open source, cross-platform software for recording and editing sounds called Audacity (http://audacity.sourceforge.net/). ReadPlease is a text-to-speech software for Windows-based operating systems: http://readplease.com/

ONE STOP SHOP:

Book Builder from CAST is a free website that can be used to create, share, publish and read digital books that engage and support diverse learners according to their individual needs, interests and skills. This site offers a library of over 3,000 books and resources for creating electronic books that are enhanced with visual supports, personal voice recordings and other auditory supports, as well as a glossary, read-aloud and translation features. Many helpful resources and tips are also provided in detailed guidance of where to find supports and how to include and cite them. These creations can be shared with the public or kept for private use and downloaded for use off-line.

Sample Book Builder Publication: Faucet Facts: the True Story of Where Water Comes From. http://bookbuilder.cast.org/

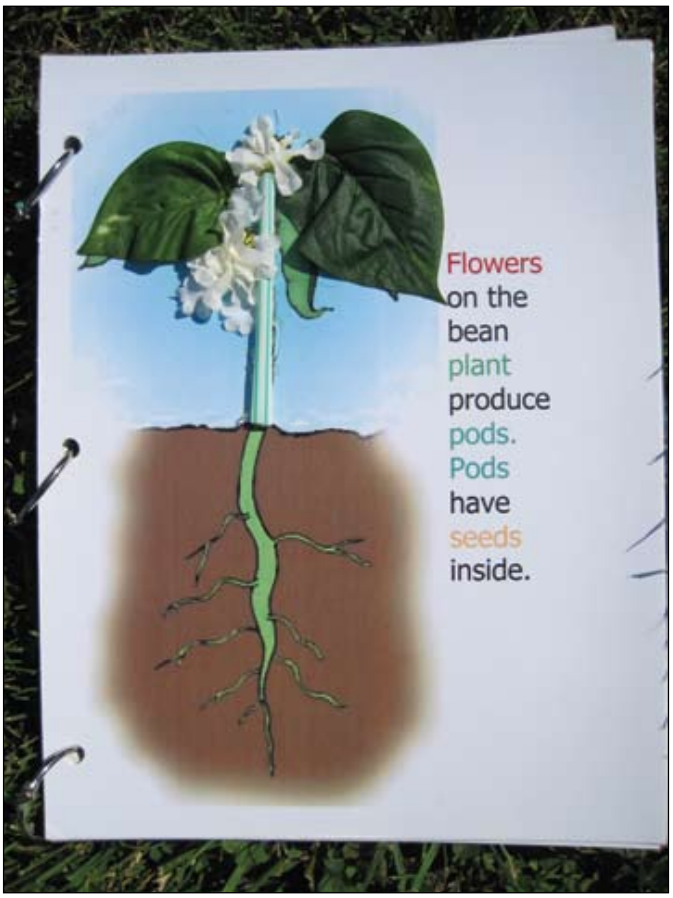
Wizard guide for Photo Story 3 for Windows, a photo presentation program.

PhotoStory: A little-known free download available from Microsoft is PhotoStory, a photo presentation program for Windows. A wizard leads one through the process of dragging and arranging photos, providing custom narration and captions. One can also add transitions, zooms, pans, audio soundtracks and/or custom auto-generated music. The result can be exported as a movie file and become an engaging and personalized slideshow with a soundtrack.

TACTILE

One should not forget the role that tactile input can have on representation, comprehension and expression. Books can be adapted with removable images to manipulate, as well as tactile supports to enhance the learning experience.

The result of Mr. Lee's efforts is that everyone learns and benefits from text. They just do not do it in the same way. Learners in Mr. Lee's class participate because they have been given access to information and the tools they need to be successful. Mr. Lee uses instructional strategies based on the principles of UDL



Tactile adaptations to curricular material.

supporting learner engagement and accommodates his learners by changes in materials and/or procedures. Mr. Lee presents in multiple ways, using many tools he already has, including MSWord and Internet resources. He allows learners to access and express what they know in a variety of ways and does not relegate them to the back of the room with "busy work."

Mr. Lee has chosen to be an agent of change in his own classroom, using a process called cognitive rescaling. He does this by keeping abreast of current technology trends.

EDUCATORS CAN AND SHOULD HONOR THEIR PREFERRED LEARNING STYLES BY:

- Choosing to visit the National Educational Technology Standards (NETS) website often. The NETS are widely recognized standards for learning, teaching and leading in the digital age and are adopted worldwide.
- Attending workshops offered by school districts.
- Participating in listservs to broaden one's perspective and to gain from and lend support to other educators.
- Attending at least one educational conference a year.
- Advocating for all learners by making the curriculum changes needed to access information in the classroom.
- Participating in school districts' curriculum committees to have a say in the decision-making process when it comes to textbook adoption.
- Making contact with textbook publishers and software developers about features that would assist all learners.
- Contacting Microsoft to urge the restoration of key UDL inclusion tools in newer versions of the Office Suite.

RESOURCES

A quick one-page tutorial of all MSWord tools and other rescaling tools cited here are provided via the resource document available at www.bit.ly/rescale

Day, L. (2009). Wonders of Word 2007: Differentiating instruction through technology. Florida Diagnostic and Learning Resources System (FDLRS). Polk County, FL. http://www.polk-fl.net/districtinfo/departments/learning/ese/documents/WondersofWord2007revised.pdf

http://www.polk-fl.net/districtinfo/departments/learning/ese/documents/WondersofWord2010rev.pdf

Judi Sweeney's website: www.Onionmountaintech.com

Wahl, L. & Duffield, J. (2005) Using flexible technology to meet the needs of diverse learners: What teachers can do, a WestEd Knowledge Brief. Retrieved 12/12/2011 from http://www.wested.org/cs/tdl/print/docs/tdl/home.htm

REFERENCES

White paper on Common Core Standards: http://www.leadered.com/pdf/Special%20Ed%20&%20CCSS%20white%20paper.pdfy

Center for Applied Special Technology (CAST) (2011). Universal Design for Learning Guidelines version 2.0. Wakefield, MA: Author.

Edyburn, D.L. (2002). Cognitive rescaling strategies: Interventions that alter the cognitive accessibility of text. Closing The Gap, April/May, 1, 10-11, 21.

Edyburn, D.L. (2003). Learning from text. Special Education Technology Practice, 5(2), 16-27.

Edyburn, D. L. (2007). Technology-enhanced reading performance: Defining a research agenda. Reading Research Quarterly., 42(1), 146-152.

Mortensen, S. (2002). Action research on cognitive rescaling. Journal of Special Education Technology, 17(4), 53-58.

Stahl, S. (2004). The promise of accessible textbooks: Increased achievement for all learners. National Center on Accessing the General Curriculum (NCAC), Wakefield, MA.

Tomlinson, C. (2001). How to differentiate instruction in mixed-ability classrooms. Alexandria, VA: ASCD.

Yoder, D.E., Erickson, K.A. and Koppenhaver, D.A., (1996). Literacy Bill of Rights. Center for Literacy and Disability Studies, P.O. BOX 3888, DUMC, Durham, NC 27710. ■