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TEXT-TO-SPEECH TECHNOLOGY FOR STRUGGLING READERS

An interview with Dr. Michelann Parr

Does Text-to-Speech Technology Help Students Learn?

Is text-to-speech technology is truly an aid for struggling readers, or just more educational technology hype?

Text-to-speech technology, which gives students the ability to listen to an audio version of any written content, fits well within a literacy environment of multiple intelligences, multi-modalities and multiple literacies.

Adhering to Universal Design for Learning (UDL) principles, the presentation of texts in different formats (auditory and visual) provides learners with a variety of ways to access the content, allowing each individual student to learn in the way that is personally most effective. This bimodal presentation of content improves comprehension and academic results.

Wise, Ring, and Olson (2000) found text-to-speech to support decoding, which frees the listener to focus on the meaning of the content rather than just the act of reading itself. This in turn encourages comprehension of larger concepts, student dialogue and writing.

But as Dr Parr from Nissing University points out, this assistive technology has even more important implications: increasing motivation and self-confidence for all different kinds of students. Research shows us that belief in oneself and choice in what and when to read act as powerful motivators for children to learn. Text-to- speech technology does just that: it facilitates independence since the student can read on his own, choice of what to read and self esteem as he is successful not only in reading the text, but in understanding grade-level content alongside his peers.

"For those students who are frustrated because of a lack of decoding skills and fluency," *observes Dr Parr,* ***"text to speech is a confident internal voice, a support for comprehension and a valuable lifelong tool."***

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How Does Read Aloud Technology Help Struggling Readers?

A child comes to school unable to read. He has difficulty recognizing letters and has trouble with the sounds each letter makes. He has little to no sight word vocabulary and has limited interest in books or stories. His parent and teachers spend extra time and use motivational techniques to encourage him to read. However he still does not develop the reading skills he needs to be able to gain meaning from text with the speed, fluency and comprehension he needs. In Grade 5 he only able to read at a Grade 1 level. Traditionally, reading strategies develop the ability to decode and make the connection between sounds and letters. However these methods are not effective for some students who have difficulty with information processing. Decoding can take an enormous amount of effort for these readers and by the time the word is successfully decoded, the child may no longer have the energy to understand or use the content. So many of these students become frustrated, entering a cycle of withdrawal from text and ceasing to read. This in turn causes them to lose contact with text of all sorts, undermining their reading development and the acquisition of knowledge and understanding in all subjects.

Assistive technology, and specifically text-to-speech technology (TTST) offers this student hope. The technology, which reads aloud as the content is highlighted, decodes the text, which a disabled learner cannot do on his own. This empowers struggling readers to work autonomously at grade-level, giving them the chance to put aside decoding difficulties and move on to high-level thinking. Disabled readers are no longer stuck on the basics of decoding and understanding text and low-level activities but are given new and exciting opportunities to engage with the content, to make meaning from text and to develop comprehension and study skills.

This underlines the need to not only continue to teach students who struggle to read to decode, but to give them opportunities to interact with content and the written word in other ways. Research tells us that children who fall behind in reading subsequently read less, which in turn causes a growing gap in skills between struggling readers and their peers. This undermines the crucial self-belief that is necessary to cultivate strong reading skills, which lead to strong lifetime study skills. Choice has also been shown to be a key motivator in encouraging readers – allowing students to choose what, when and how to read.

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"Struggling readers should not be limited to low-level activities focused on decoding and literal comprehension," *states Doctor Parr.*

Text-to-speech technology provides struggling students a way for them to successfully decode text in order to gain higher-level comprehension, when and how they choose.

Does Text-to-Speech Technology Help Students Learn?

While a confident reader may find TTST to interfere with his own reading, average readers may find the technology to enhance their reading and comprehension, and struggling readers are freed from low-level decoding and can access texts that allow for higher-level thinking and confidence building interaction with the text and others.

So the key is to have this sort of read aloud assistive technology available and allow students the choice to use it, without any feelings of stigmatization or privilege, but merely as another educational tool among many. While teachers and parents may analyze the strengths, needs and environment of a student, the use of text to speech should be decided on by the student himself, much as the way he chooses what and when to read. When the student is allowed to decide, the technology becomes a support for choice, independence and self-esteem.

In addition, by adding text to speech to their range of literacy tools, education establishments are raising the importance of comprehension and lifelong thinking skills over word and decoding knowledge. Text-to-speech technology enables students to participate as and when they wish in the conversation that is going on around them.

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Should We Use Computers to Help Children Learn to Read?

When discussing educational technology and assistive literacy tools the question often arises whether using text to speech (TTS) is real reading? How will children learn to read if a computer reads to them? And, what happens when we take it away?

Of course the objective is to have each student reading on his own, but it is important to be realistic that not all students will read with a high level of fluency.

"Most of the students with whom I worked could decode with between 90 and 95% accuracy, but their fluency rates were incredibly low – some of them were reading at 32 words a minute in order to decode with 95% accuracy "" *indicates Doctor Parr.* ***"When they got to the task of meaning-making and comprehension, they had no energy left. They could not remember what they had read."***

So the issue is not just reading, but the amount of time and energy it takes to read and whether the reader is able to do anything with the information. In the future, struggling readers will be able to read what they need on a daily basis (e.g., prescription, directions, menus, etc.), but for more in-depth learning, the learning disabled have far greater potential if offered the support of text-to-speech technology. A struggling reader who uses text-to-speech technology will go to school enthusiastically looking forward to reading. It is likely she will continue to have difficulties with letter sounds, sight words and decoding. However, as she reads along with the highlighted text, enhancing oral and visual connections, she will take meaning from the text. This will encourage her to look at books and listen to stories, the frustration of decoding having been set aside. Her comprehension will allow her to alk about the text with her teacher and peers and give her self-confidence, which will in turn encourage her to take risks. She will be, in her own words, "a reader"! Text to speech is a way for students to become familiar with all types of content and to access grade level content. Students with reading difficulties tell us that one or two chapters read with text-to-speech technology gives them the confidence and autonomy they need for success.

Without the enabling tool of assistive technology these students would be denied access to content that allows them to learn at the same rate as the other students.

The reader must identify for themselves their own strengths and needs, and claim ownership over their own reading. If this means that they need text-to-speech technology to keep up with the demands of their schooling, so be it, it is our responsibility as educators to provide the tools needed to be successful.

"We circle back to this question of "Would you ever take a guide dog from an individual with a visual impairment?" *questions Doctor Parr.* ***"I offer that it is not our role to take something away, especially if it is enabling student engagement and self-efficacy. As readers, it is tough for us to fully understand, but if you introduce it, if you encourage it, and if you see the promise, you'll be amazed at just how far your students can go…"***

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Dr. Michelann Parr

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Michelann Parr taught Kindergarten to Grade 6 for over ten years. Her experience includes early literacy intervention and working with struggling students. She teaches language, literacy, and special education, at both graduate and undergraduate levels, in the Schulich School of Education at Nipissing University. She holds workshops on successful approaches to teaching literacy, poetry, writing, drama, and using technology as literacy support. Her research includes family literacy, text-to-speech technology and its impact on reading and writing as a way of understanding. Dr. Parr is also interested in the development of language and literacy teachers.

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ReadSpeaker is a global voice specialist providing dozens of languages and lifelike voices. Using its own industry-leading technology, the company delivers some of the most natural-sounding synthesized voices on the market. ReadSpeaker uses next-generation Deep Neural Network (DNN) technology to structurally improve voice quality at all levels. ReadSpeaker is a subsidiary of the Memory Disk Division (MD) of the HOYA Corporation, with offices in 15 countries, and over 10,000 customers in 65 countries, providing a complete text-to-speech (TTS) offering, both as Software-as-a-Service (SaaS) and as licensed solutions. A fully integrated TTS provider, ReadSpeaker encompasses all of HOYA's state-of-the-art technologies (NeoSpeech, Voiceware, VoiceText and rSpeak), providing a wide variety of applications for varying channels and devices in multiple industries. ReadSpeaker gives a voice to businesses and organizations for online, embedded, server or desktop needs, apps, speech production, custom voices and more. With more than 20 years' experience, the ReadSpeaker team of experts is leading the way in text to speech. ReadSpeaker is "Pioneering Voice Technology".

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