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Technology and Adult Learning

Improving Reading Skills for Adult Learners with Dyslexia in Incarcerated Settings with The Noah Text®-New Century Program

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Dyslexia affects 20% of the U.S. population (Shaywitz et al., 2021). Research shows that the vast majority of students who are diagnosed with learning disabilities in school are, in fact, dyslexic. Still, many students with dyslexia are not adequately identified, assessed, or supported with research-based interventions. Despite having average or even above-average intelligence, growing up with dyslexia can negatively impact an individual's self-esteem, behavior, academic performance, and overall mental health (Cassidy et al., 2021; Wilmot et al., 2022). Adults with dyslexia report struggling with reading difficulties from as early as kindergarten which impacts their learning experiences over the life span. Providing evidence-based instruction alongside supplementary digitally-mediated reading tools such as The Noah Text®-New Century program described here is critical for improving learning engagement and outcomes among adult learners with dyslexia, especially for the disproportionate number of learners with reading difficulties in incarcerated settings.

In a groundbreaking study among adult learners in prison, Cassidy et al. (2021) applied the federal definition of dyslexia, which recognizes a person's intelligence as distinct from their difficulty with reading, to identify and intervene with inmates who experience dyslexia. The study reports findings on reading and IQ scores among 145 individually-tested incarcerated men and women in two maximum-security prisons in Louisiana. It indicated that almost half (47%) could be classified as having dyslexia, with 36% determined proficient readers and 17% determined to have cognitive impairment. Equally important as these indicators was the self-reported data the adult learners involved in the study provided about their prior educational experiences, shedding light on the rarely discussed trauma of schooling for learners who struggle with reading. Over half of the participants reported that they had been expelled from school, with significant majorities of 61% and 84% who had failed or repeated a grade and dropped out of school, respectively (Cassidy et al., 2021). This study makes clear the need to integrate reading strategies and supports that are specifically designed for adult learners with dyslexia.

The high prevalence of dyslexia among adult learners in prison has been attributed to inadequate education access, reduced language use in family life, and quitting school before completion because of academic and behavioral issues (Cassidy et al., 2021). Significant efforts are now underway to improve methods for diagnosing and treating dyslexia, including at the federal level. For example, in 2018, the First Step Act (FSA) was the first major criminal justice reform to recognize the need to identify and support adult learners with dyslexia as part of a broader effort to reduce recidivism by improving access to evidence-based educational and rehabilitative programming for justice-impacted individuals.

Dyslexia at its core is a difficulty with word reading (Sabatini, 2022). The primary cause of dyslexia is now linked to variations in functioning in the areas of the brain that deal with language processing, speed, short-term memory, auditory or visual perceptions, speaking, and related motor skills (Ahire et al., 2022). With a deeper understanding of what dyslexia is and how it impacts the whole learner, researchers, educators, and technology developers are now working together to improve reading outcomes for this significant population of adult learners. Technology is not

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only changing the way we understand and identify dyslexia, but how we design targeted interventions to specifically support learners with dyslexia. Assistive technology, such as text-to-speech software, has been shown to improve comprehension. Preliminary studies reveal that the word-level scaffolding found in Noah Text® has been shown to build confidence, fluency, comprehension, and orthographic mapping for adults with dyslexia in incarcerated settings (Michigan State University in conjunction with New Century Education Foundation, 2021b).

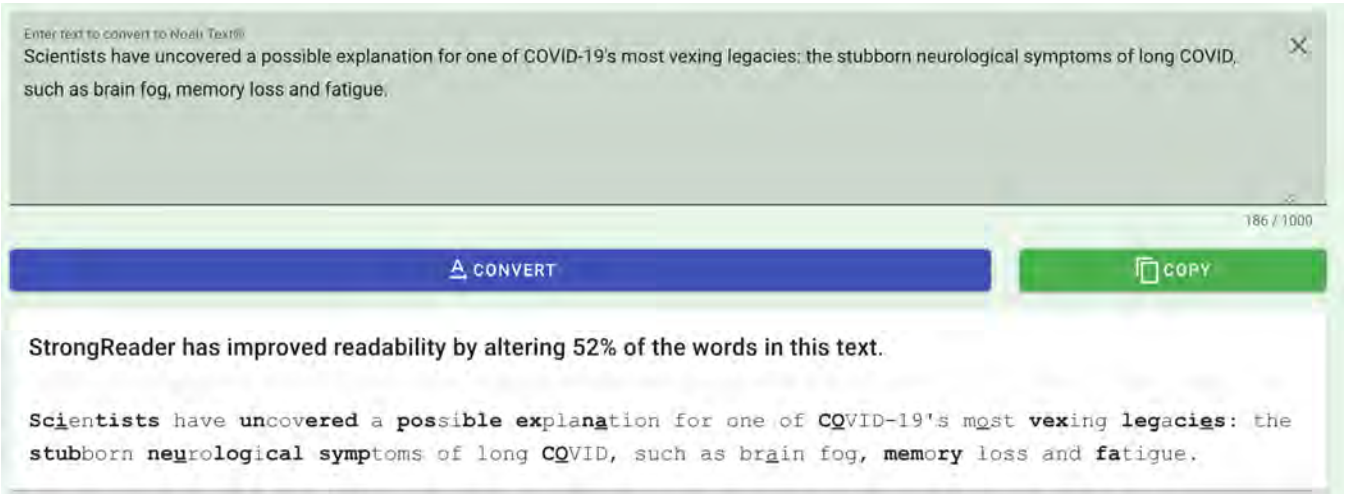
What is Noah Text®?

Based on the science of reading, Noah Text® is a patent-pending method for adapting text to improve reading fluidity for learners with dyslexia. It was developed by researcher Sarah K. Blodgett, whose son struggled with reading. Noah Text® aims to improve text accessibility at the word level, building critical writing-sound pattern awareness. The tool provides visual cues to make clear the connections between written language and sound in a given text. Noah Text® provides visual scaffolding at the word level that allows readers to see the sound parts within a word in order to improve decoding and enunciating skills. It does so by highlighting syllables and long vowels to ease reading fluency while keeping the words fully intact. It guides the reader toward predictable patterns in English, which is a largely unpredictable language given the pervasive differences between spelling and speaking. As any reading or English teacher can attest, English is not always phonetic, making it difficult even for native speakers to learn to read and write. Consider the words "though" or "receive." Noah Text® recognizes language patterns to facilitate reading, and over time, the patterns become more intuitive. Noah Text® appears to remove the typical stumbling blocks that struggling readers most often encounter with multisyllabic and/or difficult-to-pronounce words.

Opportunities to Support Reading Fluency for Adults with Dyslexia Using Noah Text®

Reading with Noah Text® is said to be intuitive for learners with dyslexia. Adult educators in and outside of correctional education settings can test the effectiveness of this tool with adult learners who struggle with reading, especially those who experience dyslexia. To generate a reading passage in Noah Text®, educators can convert plain digital text into Noah Text® using the free online StrongReader™ Builder conversion tool via https://noahtext.com/. The tool adapts the text into Noah Text®, creating a more readable version that enables learners to see critical orthographic

Figure 1



For adult learners with dyslexia, there are multiple factors that impact their reading and learning experiences. Adult educators can use Noah Text® as a conversation starter to better understand the experiences and perceptions of adult learners with dyslexia and support the whole learner.

sound patterns (rimes, syllables, long vowels) to help facilitate the mapping of letter to sound. This word-level scaffold is particularly helpful for learners with dyslexia. To support reading fluency and comprehension for learners with dyslexia, educators might provide a digital or printed version for learners in Noah Text®.

Imagine that you are working on a science or health-related unit with adult learners and want to read and discuss an article about long COVID. Consider the example above. At the top of Figure 1, you can see the topic sentence from an article about long COVID in plain text, "Scientists have uncovered a possible explanation for one of COVID-19's most vexing legacies: the stubborn neurological symptoms of long COVID, such as brain fog, memory loss and fatigue" The text was copied and pasted into the conversion tool to generate the same sentence in Noah Text®. Theoretically, reading this format can aid visual processing and remove stumbling blocks that learners with dyslexia often encounter when reading.

Preliminary Research Using The Noah Text®-New Century Program with Adults in Incarcerated Settings

Since Noah Text® launched in 2016, the technology tool has been continually studied through a collaboration with New Century Education Foundation, a nonprofit that designs, develops, and distributes educational software products for students with special needs, and researchers at Michigan State University. As part of this work, the team developed a set of lessons that use Noah Text®, the word-level scaffolding, throughout the curriculum, a chapter-book based online reading instructional product designed to support essential skills and strategies in word identification (syllabication, segmenting, blending, orthography), morphology, vocabulary, comprehension, and written response to literature. The content used in New Century's lessons comes from young adult books that were also developed by Sarah K. Blodgett and published in Noah Text®. Several pilot studies have been conducted on the effects of The Noah Text®-New Century program on learner reading gains by researchers at Michigan State University in partnership with New Century Education Foundation, including reading gains among adult learners with dyslexia who are experiencing incarceration.

The team found significant gains in reading fluency, comprehension, and vocabulary from a pilot study of 14 male adult learners in a Louisiana prison. In 2 months, all 14 of the adult learners (11 designated as having reading disabilities and three identified as English language learners) demonstrated gains in oral reading proficiency in plain text. Vocabulary scores were shown to improve by a mean of 13% from pre- and post- tests also in plain text. Finally, adult learners achieved an average of an 11-point gain on the TABE Language and Reading Test in plain text. According to Blodget et al. (n.d.), the word-level scaffolding found in Noah Text® builds confidence, fluency, comprehension, and orthographic mapping through application and transfer. Researchers noted that some students who were part of the Noah Text®-New Century program pilot project were even qualified to take and pass their high school equivalency exam in English (Michigan State University in conjunction with New Century Education Foundation, 2021a).

The research team at Michigan State University make clear that this digitally-mediated reading intervention has shown to be most effective among adult readers who start between a third and seventh grade reading level (with scores of 480-550 on the TABE Reading subtest). Among adult learners within that range, results have consistently shown reading improvements, including increased confidence in reading proficiency. Preliminary research also revealed increases in stamina and confidence while building overall reading skills that has been shown to transfer to plain text reading that is not in Noah Text® (Michigan State University in conjunction with New Century Education Foundation, 2021a). The transfer to plain text reading is among the most significant findings, though the mechanisms for those gains are still being studied. The research team continues to explore pilot studies to examine the effects of The Noah Text®-New Century Program intervention on more adult learners in incarcerated settings, including women.

Limitations to The Noah Text®-New Century Program

While initial results on the effectiveness of The Noah Text®-New Century Program for adult learners with dyslexia are promising, findings may not be generalizable to all adult learners, especially learners with emerging

reading skills. Another limitation is the dearth of reading material available in Noah Text®. At this point, there are several novels available through The Noah Text®-New Century Program, but there are limited non-fiction materials across subject areas and literary genres. It is important to note that this program is designed to be a supplementary intervention, rather than a full reading curriculum for learners with dyslexia. Educators still need to make decisions about when and how to integrate the digitally mediated reading intervention with adults who have dyslexia. Finally, the New Century-Noah Text® model is not computer-adaptive. All adult learners move through the same program without the ability to increase or decrease reading difficulty. One area worth exploring would be the integration of this program with other reading programs or technologies designed to measure reading comprehension, such as eye-tracking tools (Meziere et al., 2023).

Conclusion

According to data from the U.S. Department of Justice (n.d.), more than 10,000 individuals are released from state and federal prisons *every week* across communities in the United States, and approximately two-thirds of returning citizens are rearrested within 3 years. This cycle of crime negatively affects the individuals involved, their families, and their broader communities (Steurer, 2020). Studies repeatedly show that participating in educational programs while incarcerated reduces recidivism, indirectly resulting in reductions in crime, taxpayer savings, and positive multi-generational impact for families (Steuer, 2020). Beyond statistics, engagement with prison education has also been shown to improve the overall well-being of individuals in incarcerated settings, leading to increased self-perceptions, academic resilience, and personal development (Baranger et al. 2018). Leveraging digital tools, such as The Noah Text®-New Century Program, has the potential to enhance multiple areas of reading, and even more importantly for adult learners with dyslexia in incarcerated settings, build reading confidence, self-esteem, and increased motivation for lifelong learning. In corrections, access to consistent, high quality literacy support remains a challenge, despite the well-documented benefits to individuals and communities. Using technology can increase participation in literacy-skill building activities for adult learners in incarcerated settings and broaden the impact of educational and rehabilitative programming.

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