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Using Technology to Help Struggling Readers

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Cincinnati Children's Hospital Medical Center

Learner Outcomes

As a result of this presentation, participants will be able to:
• Identify the signs of a reading difficulty
• Define dyslexia
• Name at least three ways to assist children who have reading difficulties
Presenter Bio

Miami University of Ohio: Middle Childhood Education

Middle school reading teacher

Xavier University: Master of Education in Reading

Reading Specialist at Cincinnati Children’s Reading and Literacy Discovery Center (RLDC)

Agenda

• The Reading Process
• Reading Difficulties
• Dyslexia
• Specific Technology Resources
• Q & A
Reading is Complex!

• Not an automatic, natural-born talent
• Neurological process
• Involves constructing meaning while interacting with the text

“The act of reading is so easily taken for granted that we forget what an astounding feat it is. How can a few black marks on white paper evoke an entire universe of sounds and meanings? The mystery thickens when we consider that we read using a primate brain that evolved to serve an entirely different purpose.”

– Reading in the Brain by: Stanislas Dehaene
Importance of Early Literacy

• “We are excited to show, for the first time, that reading exposure during the critical stage of development prior to kindergarten seems to have a meaningful, measurable impact on how a child’s brain processes stories and may help predict reading success.” — Dr. John Hutton

[Read more at: http://cincinnatichildrensblog.org/in-the-news/research-proves-reading-to-kids-promotes-brain-development/#.VsIYhvkrLIU]

• “Early literacy is so important for a child’s success that we recently included third grade reading proficiency as an indicator of child health.” — Michael Fisher, President and CEO of Cincinnati Children’s Hospital Medical Center


Literacy Milestones

(See http://www.asha.org/public/speech/development/kindergarten/ for complete list.)

• Kindergarten – recognizes letters and letter-sound matches
• 1st grade – identifies and blends sounds in words
• 2nd grade – has fully mastered phonics/sound awareness
• 3rd grade – uses word analysis skills when reading

Compiled from information provided by the American Speech-Language-Hearing Association, Linguisystems, Inc. (L. Christofaris, 2009)
5 Pillars of Reading (National Reading Panel, 2000)

- Phonemic Awareness
  - Segmenting & blending sounds in spoken words
- Phonics
  - Letter-sound correspondence
  - Decoding and encoding
- Vocab.
  - Meaning of Words
- Fluency
  - Speed
  - Accuracy
  - Prosody
  - Tone
  - Emotion
- Comprehension
  - Understanding
  - Making sense of what you read

Executive Functions:
- Attention
- Speed of Processing
- Inhibition
- Memory

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What we see

What we don’t see

Credit: Tzipi Horowitz-Kraus, 2015
Signs of Reading Difficulty

- Family history of reading problems
- History of being a late talker
- Difficulty rhyming words
- Difficulty saying or writing the alphabet
- Difficulty remembering letter sounds
- Difficulty reading new words
- Slow, difficult reading and/or writing
- Difficulty answering questions about what was read
- Reading below grade level
- Difficulty spelling or writing ideas on paper

Other Contributors to Reading Difficulty

Credit: Tzipi Horowitz-Kraus, 2015
Comprehensive Reading Evaluation

- Cognition
- Language
  - “Oral language abilities (listening and speaking) are considered the best predictors of reading and spelling.” – The International Dyslexia Association
- 5 Pillars of Reading
- Spelling
- Writing
- Attention/Executive Function

Examples of Assessment Items

- Phonemic Awareness:
  - Say “toothbrush.” Now say “toothbrush” without saying “brush.”
  - Say “cup.” Now say “cup” without saying /k/.
- Orthography:
  - Sight word efficiency (is, up, cat, red, me, yes)
- Decoding:
  - Nonsense words (ip, ga, nasp, chur, pim)
Examples of Assessment Items

Fluency and comprehension:

- Sentence or paragraph reading
- Cloze procedure: Words are omitted from the passage, and child fills in the blank.
- “Does the sentence make sense?” Yes/No
- Oral and silent reading are important.
- Miscue analysis: What are the child’s mistakes telling us?

Recommended Instruction

Provide direct, systematic, and multisensory instruction.

straightforward logically organized using more than one sense

Examples of programs using this design: Orton Gillingham, Sound Partners, Wilson Reading*

### Examples of Strategies

Instruction should be presented in a direct, systematic, and multisensory way with examples.

<table>
<thead>
<tr>
<th>Area of Challenge</th>
<th>Recommended Strategies</th>
</tr>
</thead>
</table>
| Phonemic Awareness & Decoding (segmenting/blending sounds) | • Sound string  
• Elkonin sound boxes |
| Orthography (word structure)                          | • Fry or Dolch words (sight words)  
• Prefixes, suffixes, root words |
| Fluency                                               | • Partner or choral reading  
• Repeated readings |
| Comprehension                                         | • Visualizing/drawing pictures  
• Making connections  
• Graphic organizers |
| Attention                                             | • Set a timer. Use Brain Breaks.  
• Routines and consistency |

**Elkonin Sound Box**

- Say, “cat.”

```
  ●  ●  ●
  □  □  □
```

- Child moves counters for /c/ /a/ /t/.

[http://www.readingrockets.org/strategies/elkonin_boxes](http://www.readingrockets.org/strategies/elkonin_boxes)
Elkonin Sound Box

http://www.readingrockets.org/strategies/elkonin_boxes

In Any Environment...

• Provide multiple opportunities for independent reading!
  • Children should be reading with at least 90 – 95% accuracy in order to avoid frustration.
  • Student choice is important.
  • Encourage use of audio books for struggling readers.
  • Help children interact with the text.
Motivation is Key!

- Emotions and attitudes toward reading can greatly affect performance.
- Prevent discouragement:
  - Keep it interactive.
  - Provide student choice.
  - Meet students at their instructional level.
- Provide tools to help.

Dyslexia – Myth or Fact?

Dyslexia is the result of poor literacy education.

**MYTH:** Dyslexia is the result of poor literacy education.

**FACT:** Dyslexia is the result a brain *difference*. It is a reading disability that is neurological in nature. Tends to run in families.
Dyslexia – Myth or Fact?

Dyslexia is the most common cause of reading, writing, and spelling difficulties.

**FACT:** Dyslexia is the most common cause of reading, writing, and spelling difficulties.

---

A child has dyslexia if he or she reverses letters in reading and writing.

**MYTH:** A child has dyslexia if he or she reverses letters in reading and writing.

**FACT:** Reversals or inversions of letters are common until second grade. Beyond that, it is important to look at other indicators (not just one symptom in isolation.)
Dyslexia – Myth or Fact?

Dyslexia cannot be outgrown.
**FACT:** Dyslexia cannot be outgrown.

However, children with dyslexia can make great strides with the right instructional programs.

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Dyslexia – Myth or Fact?

Children with dyslexia have low intelligence.
**MYTH:** Children with dyslexia have low intelligence.

**FACT:** They typically have average or above average intelligence. It is important to capitalize on their strengths.
Definition of Dyslexia

International Dyslexia Association: https://dyslexiaida.org/definition-of-dyslexia/

“Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge.”

Definition of Dyslexia Simplified

- Language-based learning disability
- Slow, inaccurate reading
- Poor spelling
- Deficit in phonological processes
- Difficulties exist despite cognitive abilities and good instruction
- Can affect growth of vocabulary due to reduced reading
Definition of Dyslexia

In school settings:

- Specific Learning Disability (SLD) is a category within the Individuals with Disabilities Act (IDEA 2004)
- Defined as “a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell…”
- Qualifies for an IEP

Definition of Dyslexia

Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013)

In clinical settings:

- “Specific Learning Disorder with Impairment in Reading”
  - Difficulties with word reading accuracy, reading rate or fluency, and/or reading comprehension have persisted for at least 6 months despite targeted intervention
Classroom Accommodations & Modifications

- Accommodation: changes how the student learns material
- Modification: changes what a student is expected to learn
- Not cheating – main purpose is to get information, using whatever path is best for the child
- Increase engagement
- Discuss with teacher to determine what’s most appropriate
- Discuss with child so he/she knows there is no penalty for doing things differently than classmates


Reading

- Allow use of assistive technology, including audio books and/or text-to-speech software
- Provide outlines or summaries
- Preview questions and vocabulary before reading
- Allow shared reading (reading with a peer)

(Adapted from Dyslexia Testing and Information Services (DTIS) and Arkansas Dyslexia Resource Guide)
Writing, Spelling, & Notetaking

- Allow use of assistive technology, including a Franklin Speller and/or speech-to-text software
- Grade for content rather than spelling
- Substitute alternative projects for written reports
- Reduce the need for handwriting/written work
- Accept oral responses, reports, and presentations
- Allow child to reference their own dictionary of frequently misspelled words
- Provide child with copy of teacher’s notes or presentation slides
- Allow child to check notes with a peer
- Use Guided Notes (fill-in-the-blank outlines)

(Adapted from Dyslexia Testing and Information Services (DTIS) and Arkansas Dyslexia Resource Guide)

Testing

- Provide extended time
- Orally review directions with child
- Orally read tests to child
- Allow child to dictate responses
- After the test is graded, allow child to correct wrong answers for additional credit
- Adopt a “No Fail” policy
- Adjust the format of tests by enlarging font, putting fewer items on a page, creating work space, and offering word banks on the same page as the questions to which they refer

(Adapted from Dyslexia Testing and Information Services (DTIS) and Arkansas Dyslexia Resource Guide)
Homework

- Shorten assignments
- Provide extended time
- Modify spelling lists
- Assign peer “buddy” for checking assignment book and/or helping get correct materials into backpack at the end of each school day
- Make assignments available on school website
- Provide timeline for long-term projects
- Limit homework time. If child cannot complete homework in allotted time despite working to their potential, allow parent to write a note or email. Do not penalize for incomplete work if there is a note attached.

(Adapted from Dyslexia Testing and Information Services (DTIS) and Arkansas Dyslexia Resource Guide)

Instruction

- Break tasks into small steps
- Give directions in small chunks
- Provide visuals
- Give examples and model behavior
- Emphasize daily review
- Incorporate multisensory activities

(Adapted from Dyslexia Testing and Information Services (DTIS) and Arkansas Dyslexia Resource Guide)
Classroom Environment

- Post schedules and maintain routines
- Keep track of assignments on homework calendar
- Use color-coding to organize materials and information
- Coordinate preferential seating
- Avoid requiring student to read aloud in front of a group, or provide advanced notice

(Adapted from Dyslexia Testing and Information Services (DTIS) and Arkansas Dyslexia Resource Guide)

“For Americans without disabilities, technology makes things easier. For Americans with disabilities, technology makes things possible.”
- Radabaugh, 1988

http://aem.cast.org/navigating/assistive-technology.html#f.WGqH-IMrLIV
Assistive Technology Defined

• “Any item used to increase, maintain, or improve functional capabilities of a child with a disability” - Individuals with Disabilities Education Act (IDEA)

• “Devices that are used by people with disabilities to perform functions that might otherwise be difficult or impossible for them to do.” – National Center on Accessible Educational Materials (NCAEM)

• “Assistive technology (AT) is any device, piece of equipment or system that helps a person with a disability work around his challenges so he can learn, communicate or simply function better.” - www.understood.org

Assistive Technology Terms

• Accessible Education Materials
• Audio-Supported Reading
• Speech-to-Text
• Text-to-Speech
• Digital Reading Technologies
<table>
<thead>
<tr>
<th>What Assistive Technology Cannot Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Make up for ineffective teaching</td>
</tr>
<tr>
<td>• Make learning and attention issues go away</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>What Assistive Technology Can Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Supplement good instruction</td>
</tr>
<tr>
<td>• Help students work more quickly, accurately, and independently</td>
</tr>
<tr>
<td>• Help students navigate classroom routines</td>
</tr>
<tr>
<td>• Help students set and meet high goals</td>
</tr>
<tr>
<td>• Break down barriers that cause frustration</td>
</tr>
<tr>
<td>• Boost self-confidence</td>
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</tbody>
</table>

Audio Book Resources

- The Public Library
- *Learning Ally – www.learningally.org
- *Bookshare – www.bookshare.org
- Recorded Books – www.recordedbooks.com
- www.booksontape.com
- Apps: Audible; iBooks; Learning Ally; OverDrive; Audiobooks

* Individual membership restricted to those who have a demonstrated learning disability, visual impairment, or physical disability that makes it difficult to read using traditional print. Organizational memberships available.

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eBooks

- Research shows benefits and problems to using eBooks.
- Bottom line:
  - Caregiver-child engagement is still essential.
  - It is important for children to use their imagination to provide effects.

http://www.readingrockets.org/article/teaching-interactive-picture-e-books-grades-k-6
eBooks

- Google Play Books
- Kindle App
- iBooks

eBooks Supported by Audio

- “Read Along” books on iBooks and OverDrive
- Text-to-speech technology to read printed text
Text-to-Speech Technology

- Turns written material into audio
- Seeing and hearing text when reading:
  - Improves word recognition
  - Allows reader to focus on comprehension rather than decoding
  - May help children recognize and fix errors in their own writing
  - May increase "staying power" for reading assignments


Text-to-Speech Resources

- Free software built in on devices
- PC – Microsoft Office Programs:
  1) Next to the Quick Access Toolbar, click Customize Quick Access Toolbar
  2) Click More Commands
3) In the Choose commands from list, select All Commands

4) Scroll down to the Speak command and select it.

5) Click Add.

6) Click OK.

7) You can hear text spoken by highlighting the text you want to hear, then clicking the Speak command.

Text-to-Speech Resources

- iPad or iPhone:
  1) Settings → General
  2) Accessibility
3) Speech

4) Select Speak Screen
Text-to-Speech on iPad or iPhone

4) Swipe down with two fingers from the top of the screen to hear the content of the screen.

Example: Using Speak Screen with iBooks
Text-to-Speech Resources

• Adobe Reader – Read Aloud feature
  • PC:
    1) Click View
    2) Read Out Loud
    3) Click Activate Read out Loud
    4) Go back to View, Read Out Loud for additional options

Text-to-Speech Resources

• Natural Reader – web and app
• Capti Voice Narrator – web and app
• Read2Go app – corresponds with Bookshare
• Voice Dream Reader app
• Speak It! Text to Speech app
• ClaroSpeak app
• Kurzweil – Commercial purchase
• Project Gutenberg - [www.gutenberg.org](http://www.gutenberg.org)
• Optical Character Recognition (OCR) – converts scanned images/pictures into readable text format
  • Example: Readiris app
Speech-to-Text Technology

- Uses dictation (voice) to write
- Converts spoken words into digital text
- Other terms: voice-to-text, voice recognition, speech recognition
- Beneficial for children who struggle with handwriting, spelling, and written expression


Speech-to-Text Resources

- Built in on devices:
  - Windows: Start → Control Panel → Ease of Access → Speech Recognition
  - Apple products:
    - Dictation: Settings → General → Keyboards → Enable Dictation
    - Siri
- Easy Spelling Aid app
- Dragon Dictation app
- Dragon NaturallySpeaking
- Voice Typing in Google Docs (only available in Google Chrome)
Additional Technology Tools

• Notability app – notetaking; recording lectures
• American Wordspeller app – allows student to look up words based on the way they sound
• Google Chrome Extensions:
  • Read and Write for Google
  • Visor
  • Readability
  • Speak It!

Read and Write for Google

Let's Get Started

ReadWrite for Chrome™ provides support tools for the web and common file types accessible through Google Drive, including:
1. Google Docs
2. Google Slides
3. PDF
4. HTML
5. Microsoft Word (.doc)

Note: If using ReadWrite for Chrome, you will have access to all features for 30 days. After that, you will still have access to features for up to 30 days of free use. If you purchase a subscription, you will have access to all features forever.

To begin using ReadWrite for Chrome, you must first install the ReadWrite for Google Chrome™ extension in Google Docs, Google Slides, PDFs, HTML, Web sites, and on the web. The extension extension requires file access to your account. There will be two file types enabled for you to access in both order.
Reading Apps*

• Phoneme-grapheme knowledge: OG Card Deck
• Sight words: Sight Word Flip It
• Decoding and blending: Blending SE
• Orthographic knowledge: Hairy Words 1 and 2
• Reading Fluency: One Minute Reader
• Reading Comprehension: Reading Comprehension Booster

*Reference handout titled “Reading and Literacy Apps” for cited research and additional apps.

Helpful Resources

• Understood: www.understood.org
  • Tech Finder: https://www.understood.org/en/tools/tech-finder
• National Center on Accessible Educational Materials: http://aem.cast.org/
  • Assistive Technology Resources: http://aem.cast.org/navigating/assistive-technology.html
Helpful Resources

- **Reading Rockets:** [www.readingrockets.org](http://www.readingrockets.org)
- **Teaching and Learning with Digital Media:**
  [http://us4.campaign-archive1.com/?u=99dbefbe2b806335a7a8fe780&id=ea38581fcf&e=1d0bab5adf](http://us4.campaign-archive1.com/?u=99dbefbe2b806335a7a8fe780&id=ea38581fcf&e=1d0bab5adf)
- **Reading and Literacy Discovery Center (RLDC):**
  [https://rldc.cchmc.org](https://rldc.cchmc.org) – Resources page

References

References


Resource

Sign up now for updates and SLP tools from Cincinnati Children’s Division of Speech-Language Pathology

Link: https://viablesynergy.wufoo.com/forms/s3q62e1k51n5v/
Expand your Expertise with “Speech Tools”

“Speech Tools” will be delivered to you monthly from the speech-language pathology experts at Cincinnati Children’s.

Sign up below:
Speech Tools