Improve STEM Education by Implementing Individualized Format Readability

Dr. Stephanie Day, University of Central Florida
Dr. Ben D. Sawyer, University of Central Florida
Dr. Rochelle Rodrigo, University of Arizona
Amy Giroux, University of Central Florida
Workshop Agenda

12:40-12:45: Introduction & Research (Dr. Sawyer & Dr. Day)
12:45-12:50: Universal Design for Learning in STEM education (Amy Giroux)
12:50-1:00: Guided Activity with Sandbox
1:00-1:05: How to Personalize Font Styles (Dr. Day)
1:05-1:15: Mini-Lesson on Font Literacy (Dr. Rodrigo)
1:15-1:25: Guided Discussion on Teaching Font Literacy to Students (Dr. Rodrigo)
1:25-1:30: Q&A, Wrap Up
What is Format Readability?

Make small changes to text format to improve a reader’s ability to read quickly and accurately, and enjoy reading more.

Size  Weight  Width
Research

Readability

Long, long ago there lived in Kyoto a brave soldier named Kintoki. Now he fell in love with a beautiful lady and married her. Not long after this, through the malice of some of his friends, he fell into disgrace at Court and was dismissed. This misfortune so preyed upon his mind that he did not long survive his dismissal—he died, leaving behind him his beautiful young wife to face the world alone.

Readability

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Introduction & Research

**Best Font**
- Roboto: 25.5%
- Times: 7.8%
- Source Serif Pro: 13.7%
- Arial: 11.8%
- Georgia: 9.8%
- Merriweather: 9.8%
- Open Sans: 13.7%

**Best Spacing**
- Wide (0.05): 41.7%
- Narrow (-0.05): 25.0%
- Normal (0): 33.3%
Universal Design for Learning in STEM Education

- **Students are not equitable when it comes to design.**
  - Implications for students across all subject areas.
- **Limitations in features that let students reformat text in ed tech.**
- **UDL Guidelines describe displaying information in a flexible format:**
  - The size of text, images, graphs, tables, or other visual content
  - The contrast between background and text or image
  - The color used for information or emphasis
  - The layout of visual or other elements
  - The font used for print materials
Guided Activity: Format Readability Sandbox Tool

Play in the Sandbox to explore the impact of having access to the features that allow you to change your base font, your character spacing or character width, and more!

Format Readability Sandbox Tool
readabilitymatters.org/readabilitysandbox

Discuss:
- Compare features with a partner
- Which features do you think are most beneficial for you?
- Think about the ways in which you currently present materials and assess students.
- What implications could these differences have for students?
Tune Your Text
Changes to Text Size, Shape and Spacing
Create Better Reading

Play in the Readability Sandbox to learn what features might be important to you

**PDF** | Use Adobe Reader's Liquid Mode to adjust size, character and line spacing

**Web** | Many sites offer changes to font, size, and other readability features

**Kindle** | Adjust readability features-size, font, and character spacing options

Immersion Reader | Investigate font, size, and character spacing options

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**Format Personalization Tips for Students**

[https://readabilitymatters.org/articles/5-reading-tech-tips-for-back-to-school](https://readabilitymatters.org/articles/5-reading-tech-tips-for-back-to-school)
Accelerating Adult Readers with Typeface: A Study of Individual Preferences and Effectiveness

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Abstract

Information overload is the challenge of the modern era and text the medium. Every adult reader would benefit from faster reading, provided they could retain comprehension. The present work explores the reading speed gains possible solely by manipulating typeface. We consider that optimal typeface might be a matter of an individual’s preferred font, or that some fonts might be better for all users. Indeed, eight in ten of our participants believed their favorite font would be their best. Instead, our findings showed that the preferred font was seldom best, and one font did not fit all. Adult readers in our study read better with varying fonts. An average 117-word per minute difference in reading speed using the best typeface, or around 15 pages an hour, means real-world significance focuses on the challenge of identifying an individual's optimal typeface.
ONE MINUTE DESIGN:
WHAT IS FONT FAMILY?

ARIAL LIGHT
ARIAL REGULAR
ARIAL BOLD

WEIGHT
Serif fonts are recognizable by the “feet” at the tops and bottoms of the letters. They are considered more traditional fonts. Examples of serif fonts include Times New Roman, Georgia, and Garamond.
**Sans-Serif**

*Sans-serif* fonts do NOT have feet at the tops or bottoms of their letters, and are considered more modern and simplistic. If your fastest reading font is sans-serif, such as *Ariel*, some alternative font options are *Helvetica* and *Calibri*.
Monospace

Monospace fonts have characters that are all the same width, giving text the appearance of a manual monospaced typewriter. Examples of monospaced fonts include Courier New and Consolas.
Format Readability Resources

Identify your favorite font and explore similar font families!
Individualized Readability Format
In the Classroom

1. Why is this important?
   a. What would motivate teachers to incorporate?
   b. What would motivate students to use?
   c. What stakeholders can you rally to help?

2. When/where in the curriculum do you think you could incorporate it?
   a. What obstacles do you imagine exist?
   b. What resources do you have to help?
Get involved or connect TRC to a:

- **Social Media Follower**
  - Connect on Twitter, Facebook, or Instagram

- **Readability Community Member**
  - We host a monthly roundtable of readability researchers and stakeholders

- **Partner Teacher**
  - We partner with schools and teachers to test our technologies

- **Research Associate**
  - We work directly with researchers and entities on aligning projects

- **Member**
  - TRC is a roundtable of industry and nonprofit members, guiding our research

- **Other Interesting Partner**
  - Who should we be talking to? Tell us at team@thereadabilityconsortium.org

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**Research Associates**

Research Associates work directly with The Readability Consortium’s Research Team and Members on projects aligning with our interests, providing and receiving in-kind resources.

- **Shelley Rodrigo, PhD**
  - Shelley Rodrigo is the Senior Director of the Writing Program; Associate Professor in the Rhetoric, Composition, and the Teaching of English (RCTE); and Associate Writing Specialist (Continuing Status) in the Department of English.

- **Ben Wolfe, PhD**
  - Ben Wolfe is an Assistant Professor in Psychology at the University of Toronto Mississauga, where he is a Director of the Applied Perception and Psychophysics Laboratory (APP Lab). Prior to joining the faculty at the University of Toronto Mississauga, he was a postdoctoral fellow in the Department of Psychology.

- **Anna Kosovicheva, PhD**
  - Anna Kosovicheva is an assistant professor in the Department of Psychology at the University of Toronto Mississauga. She does research on visual perception, with a focus on spatial vision, eye movements,
Q&A and Wrap Up

- To better understand how format readability can optimize learning for students, we are currently seeking research partnerships with teachers and students in K-12.
  - For more details on how to get involved, please see Dr. Stephanie Day or email at stephanie.day@ucf.edu

- Any questions?