

**Process Evaluation
of an Oral Health Literacy Curriculum:
Digital Design Feedback
from Three Different Target Audiences**

James Coyle, PhD

Valerie A. Ubbes, PhD, MCHES

Miami University

Oxford, OH

Background Information

- Funding: Project is part of interdisciplinary grant across 2 colleges and 2 centers
- Focus: Functional Health Literacy
- Innovation: Oral Health Literacy for emergent and low literacy audiences

Whereas

- The World Health Organization states that **health literacy** is the number one predictor of health status and life quality;
- *Healthy People 2020* (U.S. Department of Health and Human Services) shows **oral health** as one of the top 12 indicators of our nation's health with the concern that only 44.5% (age adjusted) of people age 2 and older had a dental visit in the past year [and evidence shows that heart disease and diabetes starts in the mouth].

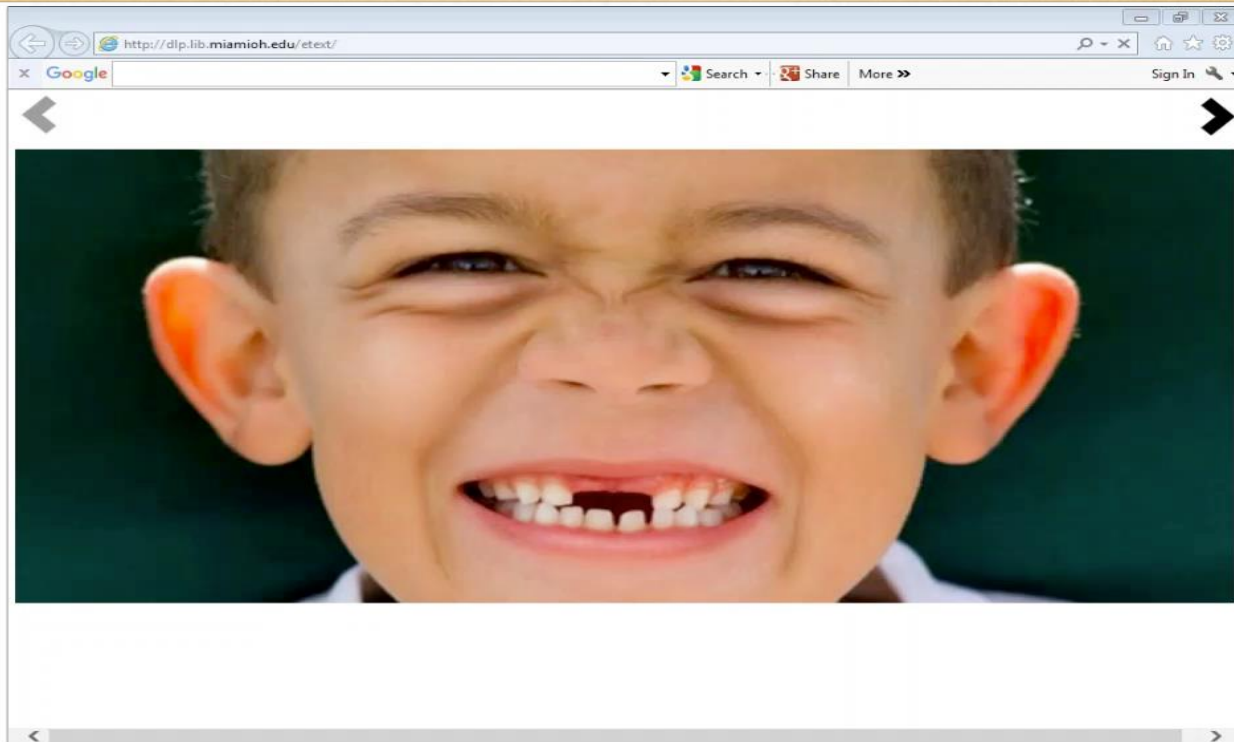
Design Solutions

Identified Problems with a Shift to Solutions

- Need for a skill-based curriculum for health, not only a fact-based approach;
- Need for health literacy to become the “new” health education because of the No Child Left Behind (2002) policy to teach children reading (and writing) skills. And now the revised ESSA policy (Every Student Succeeds Act, 2015) shifts regulatory power from the federal level to the states to regulate school performance with the potential “to put education policies into place that connect health and learning” (healthyschoolscampaign.org) and “focus on the whole child by acknowledging the importance of mental health and wellness”; and
- Need to focus on the “sine qua non” of healthy lifestyles - **daily patterns, health habits, and routines** - with the essential motivating beliefs, reasoned actions, and intentions “to do” those Habits of Health and Habits of Mind (Ubbes, 2008).

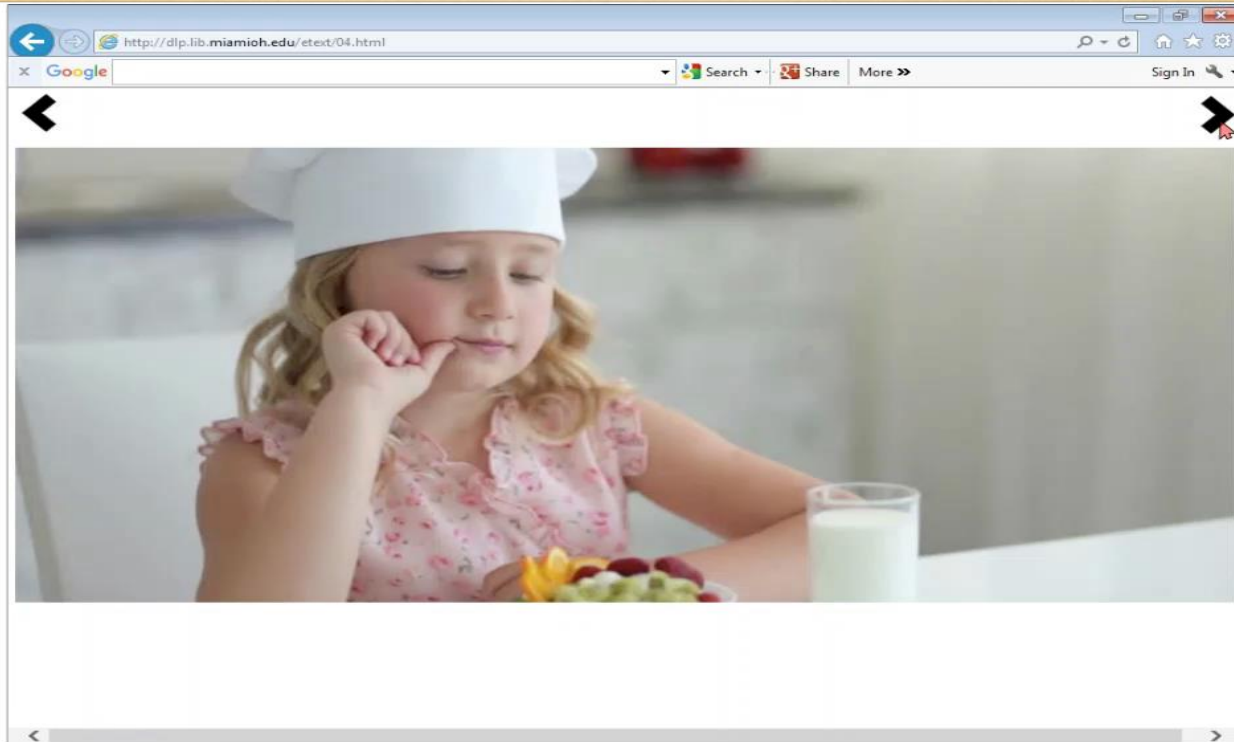
Other Design Solutions

- Need for social modeling of skills even the thinking and talking about health AND the doing of healthy habits in the form of behaviors. Hence, realistic action photographs and declarative skill-based scripts were integrated.
- Need for a positive-frame message design instead of a negative-frame message design which is prevalent in the daily media.
- How-to videos or DVDs go too fast when demonstrating the multiple “thinking and doing” plans that children will practice to do “just one” healthy habit, so self-paced learning of health skills and literacy skills becomes a key feature of the design. Hence, we wanted the developmental learner to control the learning pace.



20 40 01:00 01:20 01:40 02:00 02:20 02:40 03:00

Stimulus: Etext | Exposure time: 03:10 | parent 3 Anonymous 19-06-17 14h11m | 00:00:519 Speed 1x



20 40 01:00 01:20 01:40 02:00 02:20 02:40 03:00

Stimulus: Etext | Exposure time: 03:10 | parent 3 Anonymous 19-06-17 14h11m | 01:07:870 Speed 1x

eBook Evaluation Study

Phase 1

- Feedback led to design modifications
 - Larger photographs
 - Audio recording
 - Animation

Phase 2

- Usability Testing and Eye Tracking

Phase 1 and Phase 2 Slide Designs

I decide to chew sugar-free gum with my brothers because it is better for our teeth.



I decide to keep my teeth healthy by drinking milk every morning with my brother.

eBook Evaluation Study

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Phase 2

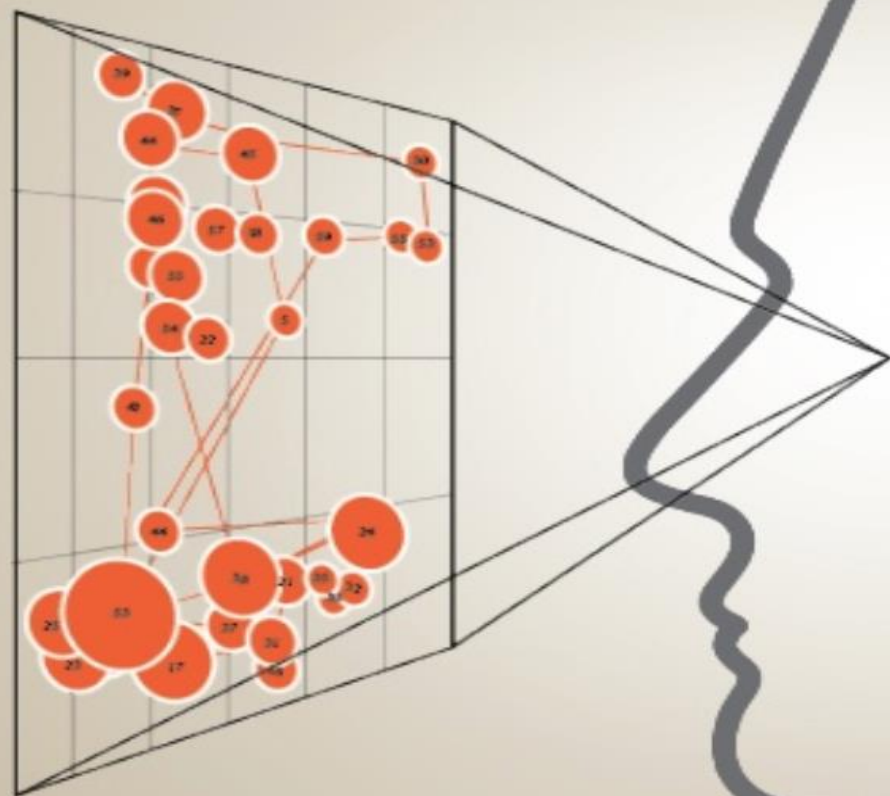
- Usability Testing and Eye Tracking

Eye-Mind Hypothesis

"there is no appreciable lag between what is fixated and what is processed" - *Just and Carpenter*



Eye-Tracking Metrics



ENGAGEMENT

Number of fixations
Total dwell time
Percentage of time on an area



PROCESSING

Fixation durations



FINDABILITY

Time to first fixation
Number of fixations prior to first fixation



PROCESSING ORDER

Gaze path



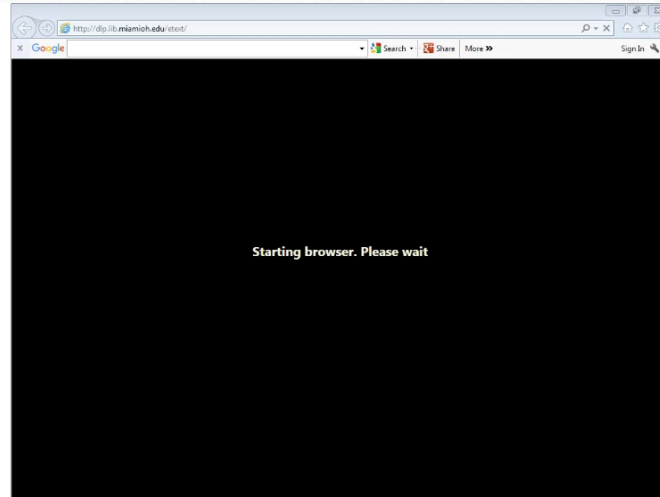
COMPREHENSION

Repeat fixations



WORKLOAD/EXCITEMENT

Pupil dilation



01:00 02:00 03:00

Stimulus: Etext | Exposure time: 03:45 | parent 1 Anonymous 20-06-17 15h58m | 00:00:00 Speed 1x

eBook Evaluation Study

Phase 2

- Usability Testing and Eye Tracking
 - **Visual interaction with design elements occurred as expected.**
 - Differences in visual processing between teachers and parents after audio icon clicked.

eBook Evaluation Study

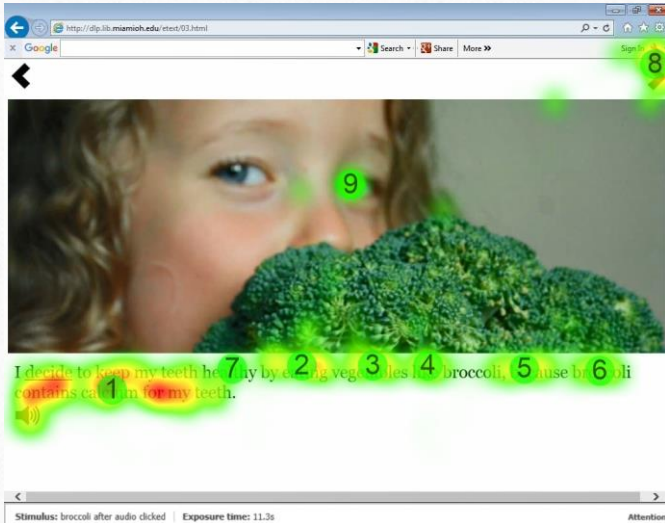
Phase 2

- Usability Testing and Eye Tracking
 - Visual interaction with design elements occurred as expected.
 - **Differences in visual processing between teachers and parents after audio icon clicked.**

Visual Processing Differences

	Overall	
	Time on text	Time on picture
Teachers	63%	13%
Parents	57%	21%
	After clicking on audio icon	
	Time on text	Time on picture
Teachers	62%	15%
Parents	55%	26%

Visual Processing Differences



Discussion

Design Principles at Play

- Multidisciplinary
- Multigenre
- Multisensory

Research Reflection

Questions that Emerged

- What are the cumulative effects of reading 10 pages of an E-Text for Health Literacy (one chapter of an eBook) when the child “reads” the words, pictures, and body language of the human role model in the photographs *without listening to a narrator read the words*?
- How does paired reading (2 people side-by-side in unison) influence reading fluency, comprehension, & health behavior versus technology-assisted reading (sound narration)?
- What do children remember about the images, words, and sounds associated with one page of an E-Text when they control the tempo of the learning episode by mouse clicks?
- How do scores on a VARK Inventory [Visual-Auditory-ReadWrite-Kinesthetic] help us understand how people interact with an eBook for Oral Health Literacy? Do children with higher kinesthetic scores report more intentions to do an oral health behavior?

References

Digital Literacy Partnership Website with 3 Databases to promote literacy, health, & technology.

<http://dlp.lib.miamioh.edu>

Tzoc, E. & Ubbes, V.A. (2017). The Digital Literacy Partnership Website: Promoting interdisciplinary scholarship between faculty, students, and librarians. *New Review of Academic Librarianship*, <https://doi.org/10.1080/13614533.2017.1333013>

Ubbes, V.A., Coyle, J., & Tzoc, E. (2017). Evaluation of the Digital Literacy Partnership and eBook for Health. EHS Interdisciplinary Research Seed Grant. Miami University, Oxford, OH.

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