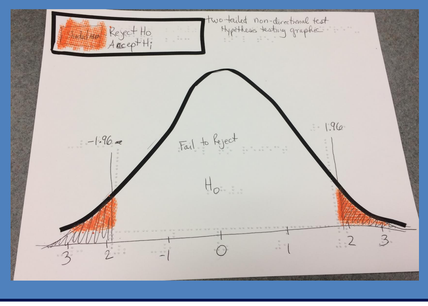

Adapting a Higher Education Statistics Course for a Braille Reader and Perspectives on Accessing Literacy in Higher Education

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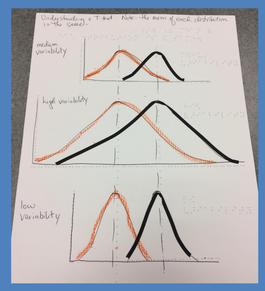

Introduction

Struggling to adapt a graduate level statistic course for Ali, a blind graduate student (for whom English was not his primary language), the administration within a School at the University of Pittsburgh hired me to adapt content and materials.

Instruction occurred via individual tutoring sessions. I periodically met with the instructor for guidance. I had full discretion to adapt course content and materials to fully tailor instruction to Ali's needs.

Literacy Access & Expanded Core Curriculum

Technology & Assistive Technology

Ali's lack of technology skills significantly impacted his ability to access the content. He needed to learn who he could ask to get training and support.

- Excel: outside resources & training (VR)
- Calculator: independent access
- BrailleNote: Humanware support

"My tutor guided me with many skills that I didn't know I need for statistics until she taught me, for instance how to use Excel. It took a lot of progress for me to understand and do the statistical assignments independently." -Ali

Self-Determination

Ali needed to know what he required and how to clearly communicate his needs to diverse stakeholders.

- Disability Services
- Director of Student Services
- Associate Dean & Professors
- Local VR Services

Language & Learning

Statistics are full of homonyms – words that sound the same but may be spelled differently as words we use in our everyday language. If you're only listening to lectures and textbooks, how can you tell the difference?

Some vs. Sum

Understanding "Sum of Squares" is critical for calculating standard deviation. It does not mean you select only <u>some</u> of the squared values.

Relative vs. Relative

(frequency distributions) Meaning "compared to" not "of blood relation."

"It's all Greek to me…"

Ali "made up symbols in [his] mind" for the math terms he did not know in braille. He was excited when he found out I knew braille and agreed that we should use existing braille codes in our work together.

⠍	μ	Greek mu
⠎	ς or σ	Greek sigma
⠠⠎	Σ	capital Greek sigma

Image Source: International Council on English Braille (2013) The Rules of Unified English Braille. Retrieved from http://www.iceb.org/Rules%20of%20Unified%20English%20Braille%202013.pdf

Statistics is challenging if you are only listening to instruction and creating your own math braille code.

By tailoring questions to his own experiences and introducing tactile graphics, statistics became engaging and accessible. Ali learned more than others expected.

Advice From Ali

→ "TVIs must teach students to assess themselves and help them to realize their strengths and weaknesses."

→ "Importantly, students need to know how to guide people who do not know how to assist them and know the best way for their future teachers to teach them."

→ "Researching and finding the essential information is most significant skill that I really wish having in my past."

*Some quotations corrected for English grammar and paraphrased with permission

Take a picture to download poster!

SCAN ME

Tactile Graphicacy

Graphics are vital to understand statistics, yet Ali had no experience with tactile graphics prior to our lessons.

Please explore some tactile graphics used during tutoring.

Lesson Progression

It was essential that gaps in foundational math and language skills were assessed and addressed during the introduction of each concept and before content was discussed.

Unit 1: Introduction & Pre-test
Unit 2: What is a Variable? and Scales of Measurement
Unit 3: Scales of Measurement & Introduction of Frequency Tables
Unit 4: Frequency Tables & Making Sense Out of Variability
Unit 5: Graphing Distributions & Measures of Central Tendency
Unit 6: Measures of Central Tendency & Percentile Rank
Unit 7: Beginning Variability & Normal Distributions
Unit 8: Measures of Position, Standard Deviations, & Standard Scores
Unit 9: Probability & Standard Scores, Standard Error
Unit 10: Beginning Inferential Statistics

Problem Sets (Homework)

Questions focused on language and comprehension before progressing to applying mathematical concepts.

> Defining terms
- 1st copy the definition from notes
- 2nd rewrite in words you're comfortable using

> Scenario questions were rewritten to be directly meaningful based on Ali's knowledge and experiences

Problem Sets were typically revised and resubmitted 2-3 times before we would move to the next concept.

- Once a problem set was submitted, I provided detailed feedback for revisions
  - Ali also had the opportunity to ask follow up questions during in-person tutoring sessions
- This process repeated until he scored ~80% & mastered key concepts

University of Pittsburgh

SCHOOL OF EDUCATION