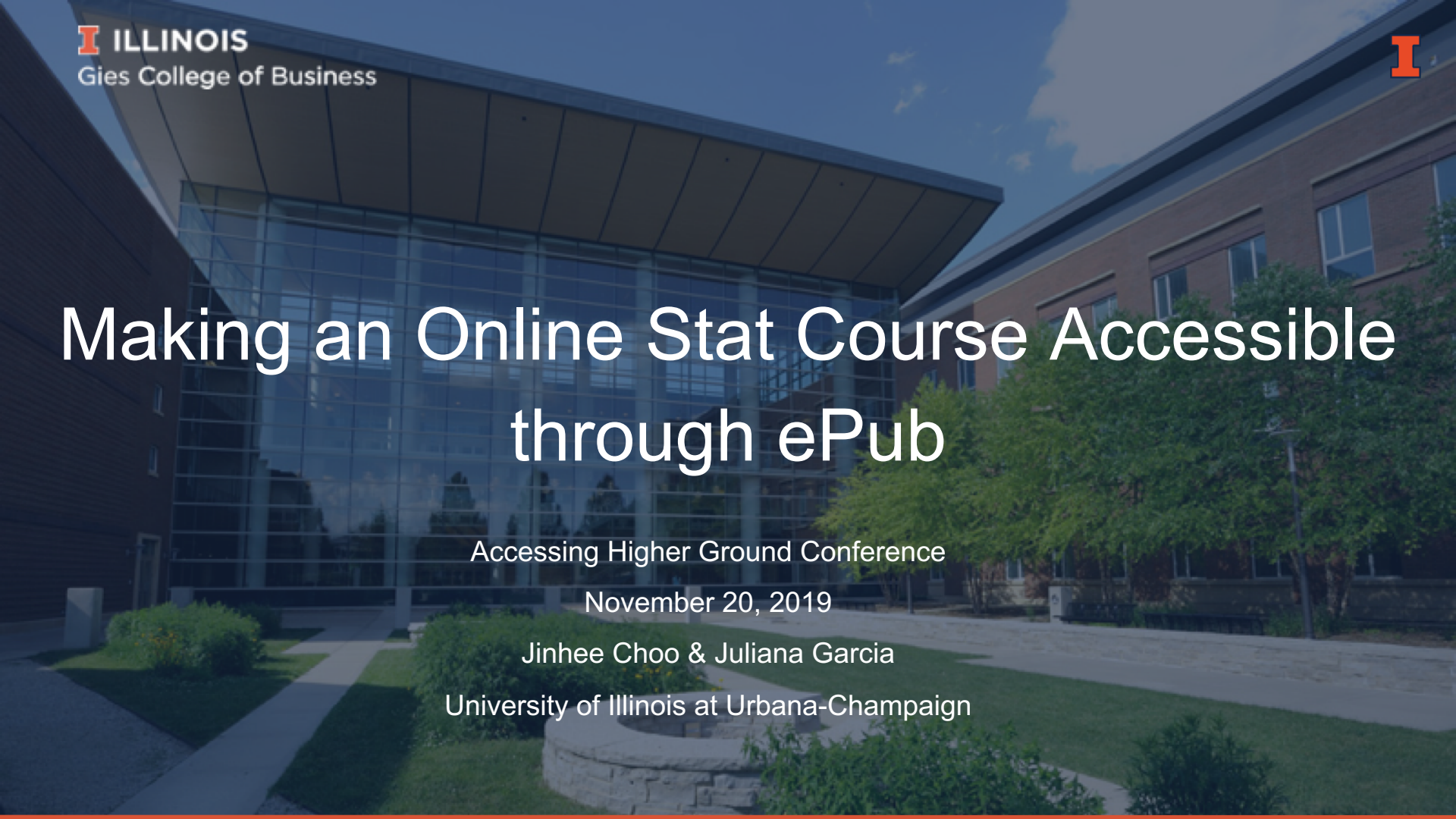


Making an Online Stat Course Accessible through ePub

Accessing Higher Ground Conference

November 20, 2019

Jinhee Choo & Juliana Garcia

University of Illinois at Urbana-Champaign

Presentation Outline

Background Context
MOOC Scale Accommodations
Extended Transcript
Challenges
Q&A

iMBA & iMSA at Univ of Illinois

eLearning Office in the Gies College of Business, the University of Illinois at Urbana-Champaign

Support for online & blended courses

Fully online graduate degree program: iMBA and iMSA

LMS: Blackboard and Coursera (~60 MOOC)

Online Student Support (½)

On-Campus Students with disabilities

- Disability Resources & Educational Services

Online students with disabilities?

Accessibility Task Force in eLearning Office

- eLearning staff (ID & media director)
- Accessibility experts/consultants
- Academic advisor
- DRES correspondent

Online Student Support (2/2)

Documents and Files in Word, PDF, PPT

- Syllabus, assignment, and quiz/exam
- Alt-text for images
- Headings
- Tables

LMS check with screen readers (JAWS)

Video lectures

- Captions

Video Lectures

3~20 videos with about 45 ~90 minutes total per week
Cleaned captions in the video player
Transcript in word
Accessibility checked PPT with alt-text added
Accessibility checked word or pdf documents with alt-text added

Non-standard Accommodations

“Screen reader users may also prefer the transcript over listening to the audio of the web multimedia. Most proficient screen reader users set their assistive technology to read at a rate much faster than most humans speak. This allows the screen reader user to access the transcript of the video and get the same content in less time than listening to the actual audio content.”

MOOC Scale Accommodations

Targeted individual accommodations
At-scale accommodations in MOOC learning environments

Extended Transcript: Usability

Replaces the less than adequate transcript, and lecture support files with a single document

- **easily converted** to other formats
- not a **different “accessible” page**
- **modifiable** by learners to fit their **personal preferences**

Extended Transcript: Goals

Single document (module by module)

Downloadable

Combines all module content to meet accessibility and, more importantly, **usability** needs

Extended Transcript Specifics

TOC
Link to the video
Slide images from PPT/Important scenes
PPT/Important text
Visual description for images
Transcript
Tables, MathML, links to external files, citations, etc.
HTML - ePub

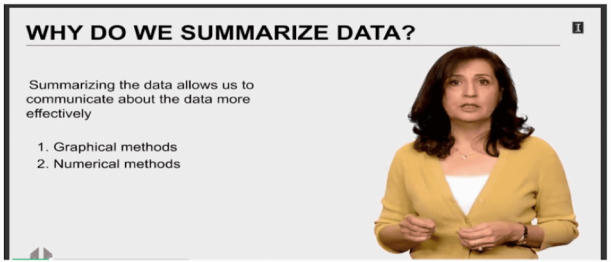
General Layout of a Lesson

Lesson 2-1 Measures of Central Tendencies

Lesson 2-1.1 Measures of Central Tendencies

Media Player for Video

Why do We Summarize Data? - Slide 1



Summarizing the data allows us to communicate about the data more effectively

1. Graphical methods
2. Numerical methods

Transcript

When you have a large data set, just looking at the data is not going to give you much insight. We can summarize a data so that we can quickly communicate some major characteristics about the data. There are two major ways to summarize a data, one is graphical method, some of which we discussed in the previous module. Another is using numerical methods. An example of this would be the average value, for instance. In this lecture, we will focus on numerical summarization.

Access Support Team

Media director (John Tubbs)
ID
A11Y consultants (Siri Bal, Knowbility)
HTML support
Copyedit/QC support

Extended Transcript Creation Process

1. Text/Image Extraction
2. Copy Editing
3. HTML Creation
4. HTML Review
5. ePub/PDF Conversion

Text Extraction

Extract text from PPT or scenes
Provide descriptions for images in the presentation

Copy Editing

Review video transcripts (verbatim) and presentations for clarity and grammatical accuracy
Edit supplemental materials following APA (i.e., citations, copyright check)

HTML Creation

Markup headings, tables, list, etc. with HTML
Add slides/ screenshots of videos with visual descriptions and transcripts

HTML Review

Inspect HTML with the Axe testing engine
Check HTML against a review checklist for accessibility and QC check
Test links to ensure that they lead to the correct local or external source
Use spell check to check for typos and spacing issues

ePub Conversion

Clean HTML to prepare for conversion
Convert HTML to ePub using an ePub editor (Sigil)
Create a PDF version (Calibre)

Tools

Axe: an accessibility testing engine from Deque Systems
Image compressor
MathML: a tool for scripting math expressions in XML from Wiris
Sigil: ePub editor
WebMAP: a tool used to help build HTML documents
Calibre: a tool to convert ePub to PDF

Stat for Management Decision Making

- Module 1: Introduction and Summarizing Data
- Module 2: Descriptive Statistics and Probability Distributions
- Module 3: Sampling and Central Limit Theorem
- Module 4: Inference
- Module 5: Hypothesis Testing
- Module 6: Statistical Inference Based on Two Samples
- Module 7: Simple Linear Regression
- Module 8: Multiple Linear Regression

Challenges

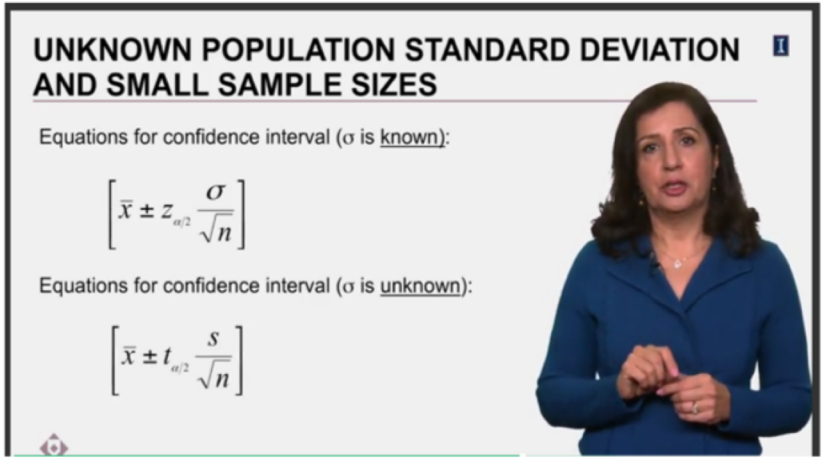
Math expressions in HTML
Visual description
Excel

Math Expressions in HTML

Simple math symbols in HTML
Math expressions in HTML
Math expressions on Coursera
Math expressions on Blackboard

MathML Example

Unknown Population Standard Deviation and Small Sample Sizes - Slide 13



Equations for confidence interval (σ is *known*):

$\left[\bar{x} \pm Z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}\right]$

Equations for confidence interval (σ is *unknown*):

$\left[\bar{x} \pm t_{\frac{\alpha}{2}} \frac{s}{\sqrt{n}}\right]$

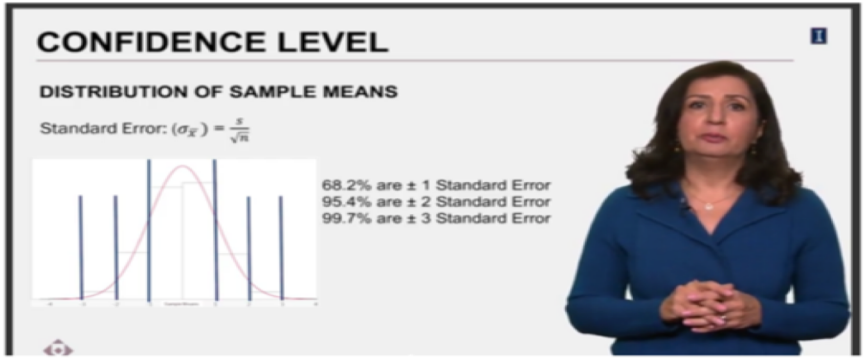
```
<math xmlns="http://www.w3.org/1998/Math/MathML">
    <mfenced open="[" close="]">
        <mrow>
            <mover>
                <mi>x</mi>
                <mo>&#xAF;</mo>
            </mover>
            <mo>&#xB1;</mo>
            <msub><mi>Z</mi>
                <mfrac>

<mi>&#x3B1;</mi>

<mn>2</mn>
                </mfrac>
            </msub>
            <mfrac>
                <mi>&#x3C3;</mi>

<msqrt><mi>n</mi></msqrt>
            </mfrac>
```

Visual Description

No Alt-Text
Balancing details and general ideas
Instructors, TAs, student workers, paid service
Training
- Diagramcenter.org
- eLearning training
  - Integrated Description for video recording
  - What and how to describe
  - Languages

Visual Description Example 1

Confidence Level - Slide 10



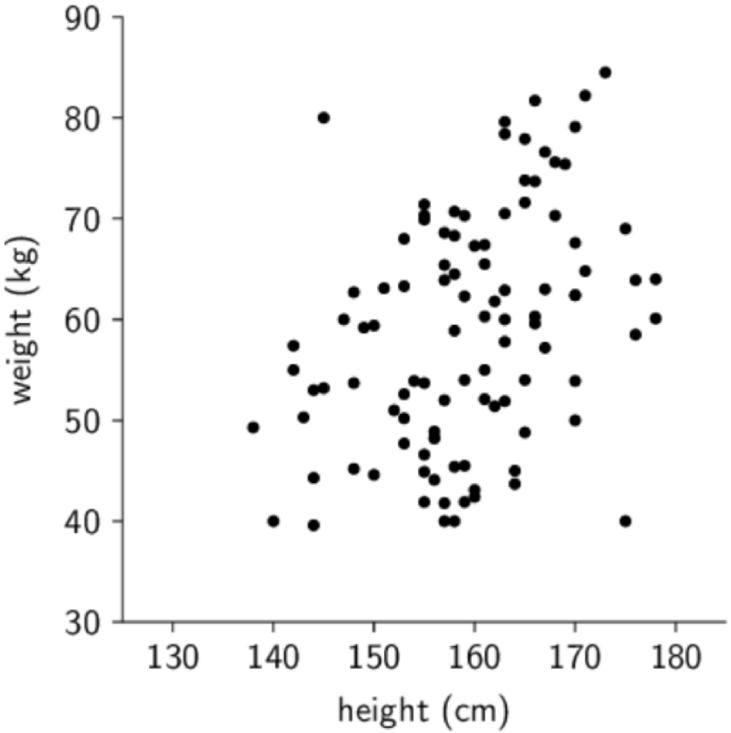
Distribution of Sample Means
Standard Error: $\sigma_{\bar{x}} = \frac{s}{\sqrt{n}}$

- 68.2% are ± 1 Standard Error
- 95.4% are ± 2 Standard Error
- 99.7% are ± 3 Standard Error

The slide shows how to understand the margin of error in a normal distribution histogram. In the graph, there is a red line, which is the bell-shaped curve of a normal distribution with mean 0 and standard deviation 1. There are two blue vertical lines at one standard error away from the mean. It stands the confidence interval of 68.2%. Then, the vertical blue lines are changed to 2 standard errors away from the mean. This range is the confidence interval of 95.4%. Finally, the vertical blue lines are changed to 3 standard error away from the mean. This represents the confidence interval of 99.7%.

Visual Description Example 2

4. What can you infer from this scatter plot?



The graph is a scatter plot with no title listed. The horizontal x-axis shows height in centimeters ranging from 130 to 180 in increments of ten. The vertical y-axis shows weight in kilograms ranging from 30 to 90 in increments of ten. The graph contains approximately 100 points that seem to be evenly spread along a linear trend that goes from the lower left corner, where weight and height are small, to the upper right corner, where both quantities are large.

Accessible Excel (1/2)

Courses handling a lot of data in Excel in the Gies College of Business

Accessible Excel tutorial (Presentation at CSUN 2019)

- Test with screen reader (JAWS)
- Easy navigation, identification of data, & clear instruction on any related activities for screen reader users
- No multiple versions

Accessible Excel (2/2)

- The more confident we want to be, the larger the margin of error must be. ***LESS PRECISE***
- Every confidence interval is a balance between certainty and precision.
- Fortunately, we can usually be both sufficiently certain and sufficiently precise to make useful statements.

Transcript

Two of the examples we have gone through we see a few things that are unfolding and they all have to do with the margin of error. First, the more confident we want to be, the larger the margin of error must be. Remember, in an earlier example when we switched the confidence level from 95% to 99%, the estimate interval became wider. Just imagine, I give you a quiz which has ten points. You're nervous and want to know, how hard are my quizzes? So, I tell you I have given this quiz to students like you and I am 100% confident that your class average will be between 0 and 10. This statement is absolutely true but it also doesn't give you any useful information. Why? Because it's too wide. Confidence without precision is not very useful. Thus, every confidence level is a balance between certainty and precision. Fortunately, we can usually be both sufficiently certain and sufficiently precise to make useful statements. From a statistical study design perspective, we can do this by paying attention to sample size. We will learn how to select the sample size on a later lesson here.

Lesson 4-2.2 Confidence Interval for Mean in Excel

Fully Accessible Media Player

Daily Temperature NY Sample Excel Sheet (1 of 22) - Slide 32

The slide shows the Average Daily Temperature data set of New York LaGuardia airport for the last 25 years. The data consists of a table with three columns: Day number, Date, and New York (La Guardia). This last column is highlighted in yellow. To the right of this table, are two cells called "Average" and "Standard deviation", which are vertically listed with their respective values. Here, the Average is 55.3 and the Standard deviation is 17.379.

Download the Daily Temperature excel file (Refer to Complete Data - First worksheet)

Final Notes

Extended transcript in ePub

- Meeting accessibility standards but “usable” wins
- The most flexible format to allow adaptability
- Best offline access

Faster creation – early in the course creation process

Questions?

jchoo@illinois.edu

Gies eLearning Office - Access Training Blog