

Newsletter

JUSTICE, EQUITY, DIVERSITY, AND INCLUSION

by Donna LaLonde

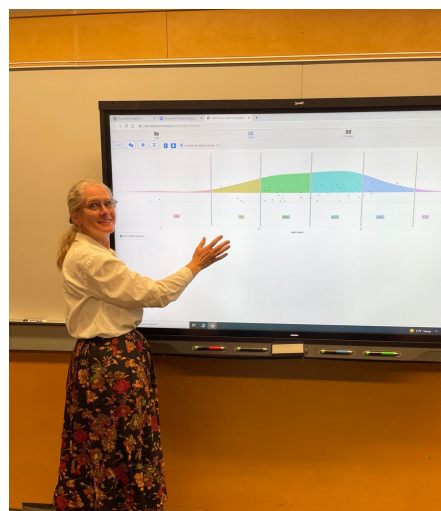
The University of Pittsburgh is celebrating 2021 - 2022 as the [Year of Data and Society](#). As a part of this initiative they are hosting a number of events including webinars which are available to the public.

Mimi Onuoha who is a Nigerian-American artist presented a webinar entitled - The Hair in the Cable ([recording available](#)). At the end of October, the [Justice, Equity, Diversity, and Inclusion \(JEDI\) Outreach Group](#) hosted its first webinar - [Incorporating Diversity Equity and Inclusion into Biostatistics Courses](#).

Although the focus of these two webinars was not on teaching Introductory Statistics, they made me think about the opportunities to encourage important discussions.

The [Social Justice & Big Data Repository](#) maintained by Grand Valley State University is a useful starting point. The repository includes links to articles, visualizations and datasets to explore social justice issues.

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**UPCOMING
ACTIVITIES**

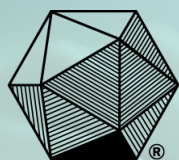
Be sure to check out our
upcoming webinar and
workshop plans on page 8.



Shannon Ellis who is an assistant teaching professor in cognitive science at the University of California San Diego wrote an informative blog - Incorporating Ethics into a Data Science course. In the blog she shares slides, favorite readings, and the course project. She also describes the course assignments including an assignment on data privacy which had students wrangle a dataset.

In the JEDI Outreach Group webinar mentioned in the opening paragraph, one of the suggestions for engaging students was to require short discussion posts. [In this article](#), Nathan Yau provides some pointers on spotting “lies” in visualizations. The recently published [Do No Harm Guide: Applying Equity Awareness in Data Visualizations](#). The guide was written by the Urban Institute’s Jon Schwabish and Alice Feng. In the introduction, the authors state, “In this guide, we explore ways to help data scientists, researchers, and data communicators take a more purposeful diversity, equity, and inclusion (DEI) approach to their work.” I think students could be added to the list of intended audiences. Although the weekly [ASA - NY Times Learning Network series - What’s Going on in this Graph?](#) is focused on middle and high school students, the visualizations are interesting and the activities could easily be adapted for older students.

I’ll look forward to reading your ideas on incorporating justice, equity, diversity, and inclusion into intro stats. Please share your activities, assignments, and projects on the MAA Connect StatPREP community.



MAA
CONNECT

Join the StatPREP Community

- Type connect.maa.org into your browser to get started
- Create an account
- Find and join the StatPREP Community

» [Getting Started Video](#)

» [Getting Started Guide](#)

» [StatPREP Connect Webinar](#)

STATPREP WEBINAR REFLECTIONS: CONFIDENCE INTERVALS

By Rona Axelrod

During a recent StatPREP webinar, we explored confidence intervals using the Confidence and T Little App. At the beginning of the session, participants were introduced to the Little App tabs (Data, Graph, Compare, and Stats), the available data sources, and the control options. We then discussed how to use the Confidence and T Little App to construct and visualize a confidence interval using one response variable and then to construct and compare two confidence intervals using one response variable and one categorical explanatory variable with two levels.

After the webinar concluded, participants reached out with the following questions:

- When comparing two groups, how do I generate a simple random sample vs. a stratified sample?
 - If the stratify option is unchecked then a simple random is generated with subjects assigned to one of two groups based on the value of the explanatory variable.
 - If the stratify option is checked then a stratified sample is generated with an equal number of subjects assigned to each group based on the value of the explanatory variable.
- If I stratify the sample, why did the sample size change?
 - If the stratify option is checked then the sample size selected (e.g., $n=50$) will be selected for each group. The sample size display will then read $n=100$ to reflect the total sample size.
- When I use the t-interval option, why didn't it behave as you described?
 - I'm still researching/learning how the t-interval option works. For now, it was recommended to turn off the t-interval option and look for an overlap between the two confidence intervals.

Many of the learning objectives that we cover in the introductory statistics course for confidence intervals were discussed during this webinar. To learn more about the Confidence and T Little App, check out the webinar recording.

A promotional banner for a webinar recording. The left side has an orange background with the text "Confidence Intervals Webinar" in blue and "View the Recording" in white. A blue circular button with a white right-pointing arrow is positioned to the right of the text. The right side of the banner features a photograph of a white coffee cup on a saucer next to a laptop keyboard on a light blue desk.

Confidence Intervals Webinar

View the Recording 

TEXTBOOK COMPANION SITE

By Kathryn Kozak

There are multiple activities written for the Little Apps that can be used in a classroom. But when should each one be utilized with students? To help answer this question, on the [StatPREP's website](#), under the For Instructor tab, there is the [Textbook companions link](#).

Textbook Companions

Textbook companions help instructors link their *textbook* to the StatPREP materials. Currently, we have companion materials for several textbooks. Follow the links below to get to the curriculum companion for each book.

- [OpenIntro Statistics \(e/4\)](#) by David Diez, Mine Çetinkaya-Rundel, and Christopher Barr. There are some extended comments [here](#).
- [Statistics with Technology \(e/3\)](#) by Kathryn Kozak
- [Elementary Statistics \(e/13\)](#) by Mario F. Triola
- [Statistics: Informed Decisions Using Data \(e/6\)](#) by Michael Sullivan III

[This site](#) contains links to the table of contents of four different books, OpenIntro Statistics by Diez, et al; Statistics Using Technology by Kathryn Kozak, Elementary Statistics by Mario Triola, and Statistics: Informed Decisions Using Data by Michael Sullivan III. Each link takes you to a listing of the textbook's table of contents, which also lists a different Little App activity that can be used to help explain the topics of that chapter. Here are portions of those table of contents:

Curricular Guide: OpenIntro Statistics, Diez et al., 4th edition

The book is online and available [here](#).

This document is keyed to the table of contents of the book.

1 Introduction to data

- 1.1 Case study: using stents to prevent strokes
- 1.2 Data basics
 - Activity: [Response and Explanatory Variables](#)
- 1.3 Sampling principles and strategies
- 1.4 Experiments
 - Activity: [Sampling Bias and the Confidence Interval](#)
 - Activity: [Intervention and Prediction](#)

[Extended comments](#)

2 Summarizing data

- 2.1 Examining numerical data
 - Activity: [Data and Point Plots](#)
 - Activity: [Shapes of distributions](#)
- 2.2 Considering categorical data
 - Activity: [Data and Point Plots](#)
- 2.3 Case study: malaria vaccine

[Extended comments](#)

Curricular Guide: Statistics Using Technology, Kozak, 3rd Edition

The book is online and available [here](#).

This document is keyed to the table of contents of the book.

Chapter 1: Statistical Basics

The `sugar` data frame is available in the Little Apps.

- Activity: [Response and Explanatory Variables](#)

§1.1: Sampling Methods

Each Little App can take a simple random sample from any of the datasets. Choose a large dataset—use "All" for the sample size—and say that for the purpose of demonstration, we'll consider this to be the population. Then show the process of selecting a simple random sample.

When a categorical explanatory variable is selected, you can also do a stratified sample. Ask what different between a stratified sample and a simple random sample. (You can turn stratification on and off to see the difference. This will be most obvious when the explanatory variable has very different numbers of points at the different levels.)

NOTE: There's a StatPREP activity on sampling bias, but it is written in terms of the confidence interval, which has not yet been introduced in this book.

- Activity: [Sampling Bias and the Confidence Interval](#)
- Activity: [Intervention and Prediction](#)

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Curricular Guide: Elementary Statistics, Triola, 13th edition

This document is keyed to the table of contents of the book.

Chapter 1. Introduction to Statistics

- Activity: Intervention and Prediction

Chapter 2. Exploring Data with Tables and Graphs

- Activity: Data and Point Plots
- Activity: Shapes of distributions

Chapter 3. Describing, Exploring, and Comparing Data

- Activity: Comparing Two Groups

Chapter 4. Probability

Chapter 5. Discrete Probability Distributions

Chapter 6. Normal Probability Distributions

- Activity: Shapes of distributions
- Activity: Parameters and the Normal Distribution
- Activity: Common, Uncommon, and Rare

Curricular Guide: Statistics: Informed Decisions Using Data 6th edition, Sullivan, 6th edition

This document is keyed to the table of contents of the book.

Chapter 1 Data Collection

- Activity: Intervention and Prediction

Chapter 2 Organizing and Summarizing Data

- Activity: Data and Point Plots
- Activity: Shapes of distributions

Chapter 3 Numerically Summarizing Data

- Activity: Comparing Two Groups

Chapter 4 Describing the Relation between Two Variables

- Activity: Introducing Linear Regression
- Activity: Describing Relationship Patterns in Words and Numbers
- Activity: How much is explained?

Chapter 5 Probability

Chapter 6 Discrete Probability Distributions

The OpenIntro Statistics book also has [extended comments](#), in which an annotated table of contents offers suggestions for how to cover material in the textbook.

Chapter 1: Introduction to data .

Section 1.1: Using stents

The data sets referenced are `{openintro::stent30}` and `{openintro::stent365}`. The data in Figure 1.1 are `stent30` and `stent365` put together row-wise. There is no patient number in the data. 1. *Activity*: Center & Spread to show the individual cases. Use: [Data and Point Plots activity](#)

Section 1.2: Data basics

The data set in 1.2.1 is `loan50`. Remember to set `n = All`.

1. Use the [Points and Density](#) Little App to draw graphs of the variables pairwise. Emphasize the overall shapes of the four different possibilities:
 - a. quantitative vs quantitative: "a cloud"
 - b. quantitative vs categorical: "vertical bands"
 - c. categorical vs quantities: "horizontal bands"
 - d. categorical vs categorical: "boxes"
2. Add in a second explanatory variable, using color. Best to use variables with only a few levels, such as `homeownership`.

You can do much the same with the `county` data set. Again, set `n = All`.

The data in Exercise 1.12 (UN Votes) are from the `{un_votes}` package. Although not mentioned in the text, this is a good example of how data are stored as different files, each with its own unit of observation. - `un_votes`: a country voting on a resolution, a.k.a. `rcid` - `un_roll_call_issues`: a characterization of the issue relating to the vote. Unit of observation is an `rcid` - `un_roll_calls`: dates, sessions, amendments and other "details" of the vote. Unit of observation is an `rcid`.

Also on the companion site is a listing of different textbooks that can be used in an introduction to statistics course. Though we don't endorse any book, this gives a listing of some of the options that are available. Of course, it is not an exhaustive list.

As one can see, not every chapter has Little App activities. However, if you have activities that you do in your classes that you would like to share, please let the statPREP team know. These activities do not need to be tied to the Little Apps since not all of the topics fit in with the Little Apps. Sharing your activities can help to improve student learning.

Lastly, if you use a textbook other than one of the ones listed on the site, and would like to have a curriculum guide for that textbook, please let Kathryn Kozak know, (kathryn.kozak@coconino.edu). As long as the table of contents is accessible, a companion site can be created for that textbook.

EDUCATION AFTER THE PANDEMIC: PROMOTING FLIPPED CLASSROOMS

By Ambika Silva



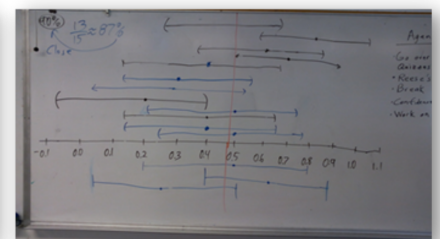
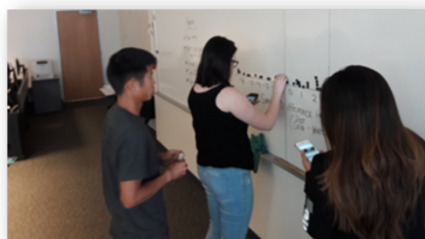
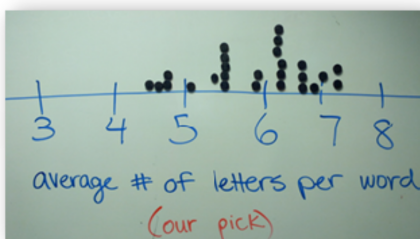
The recent pandemic turned education into a large-scale experiment. Education systems, colleges, and classrooms had to stop many old practices and invent new ones. Instructors started to create content online, meet students virtually, and find creative ways to engage learners. As we return to the classroom, many of us may be asking how this experience we've had teaching online will affect our in person

teaching. Many instructors have material that they've made for online instruction and are wondering what to do with all the content they have. I encourage all faculty to think about flipping their in-person statistics classroom as it truly changed my life as an educator. Making videos and having students fill in notes as homework and then coming to class and doing activities and homework assignments was more engaging, I believe, for both me and my students. We had time for activities we never had time for before, and students were able to work together on the material.

WHAT DOES IT MEAN TO FLIP A CLASSROOM?

The flipped classroom is a pedagogical model in which the typical lecture and homework elements of a course are reversed. Short video lectures are viewed by students at home before the class session, while in-class time is devoted to exercises, projects, or discussions. (Educause, 2012)

In a flipped classroom, the "lecture" is done prior to class. That way, when the students enter the classroom they have come in with some knowledge of the material. In class, we can then reinforce, practice, and do activities related to the material rather than a traditional class where students learn in class then do homework out of class.



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WHAT DO I DO TO GET STARTED?

During the pandemic, you may have already made lots of content or found content online. If not, ask yourself if you want to make your content or find already-made content.

Making Content:

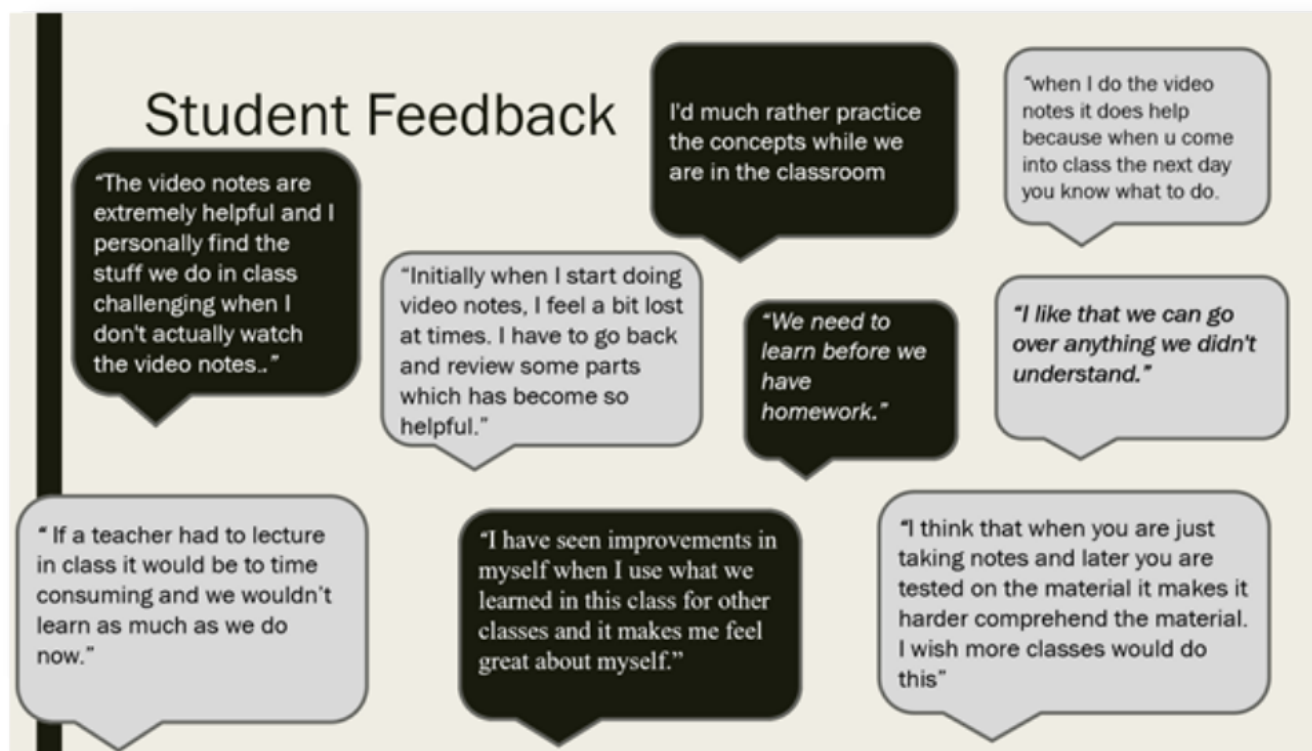
- First, create a document (doc, ppt) for students to fill in as they watch.
- Then you need to make a video to add the extra content!
- Put minimal work in the handout, make them write the essentials! Just like you would in class

Personally, when I first started recording videos I used [Screencast-O-Matic](#) but I've used my Zoom recording recently as it does closed-captioning automatically.

WHAT DID MY STUDENTS SAY PRE-PANDEMIC?

The short answer is.... They love it!!!! I usually had about 1 or 2 out of every 100 students say they don't like it. And usually, they've changed their mind by the end of the semester!

But don't take MY word for it, read a few quotes from them!



Save the Date

WEBINARS WILL RETURN IN JANUARY



StatPREP will resume monthly webinars beginning in January 2022. You look forward to topics such as: Little App activities for your classroom, RStudio training, and more.

Can't wait? Don't worry - all of our fall and previous webinars are posted on statprep.org.

[WATCH NOW](#)

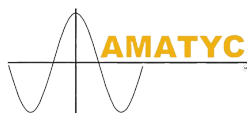
STATPREP SUMMER 2022 WORKSHOP



In-Person Workshop in Fort Myers, Florida, will be held on May 20-21, 2022.

Workshops are open to anyone teaching post-secondary introductory statistics during the 2022-2023 academic year. The workshop is free, and all materials and meals during the workshop are provided. There is an up-to \$100 stipend available to help cover travel expenses for workshop participants.

[APPLY NOW](#)



LEADERSHIP TEAM

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Danny Kaplan, Macalester College

Kathryn Kozak, Coconino Community College

Donna LaLonde, ASA

Ambika Silva, College of the Canyons

Deirdre Longacher Smeltzer, MAA

HUB LEADERS

Joe Roith, St. Olaf College, Northfield, MN (2017-18)

Ambika Silva, College of the Canyons, Santa Clarita, CA (2017-18)

Helen Burn, Highline College, Seattle, WA (2018-19)

Hwayeon Ryu, Elon University, Elon, NC (2018-19)

Carol Howald, Howard Community College, Columbia, MD (2019-2020)

Thomas Kinzeler, Tarrant County College, Fort Worth, TX (2019-2020)

Rona Axelrod, Florida SW State College, Fort Myers, FL (2020-2021)