

Bringing Data and Tools Into Classrooms Through Online Large-Scale Teacher Education

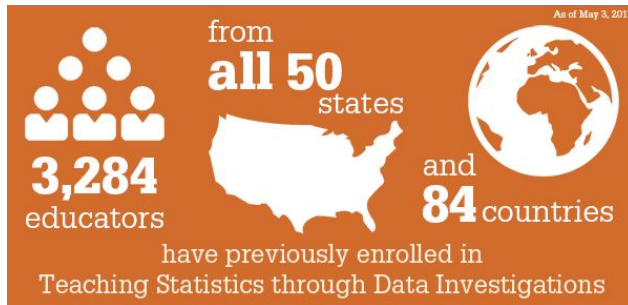
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Not with us today: Jennifer Lovett & Stephanie Casey

Online “Large” Scale Contexts



**Teaching Statistics
Through Data
Investigations**



Teaching Mathematics with Technology
MOOC-Ed--about 1000 enrollees thus far

--two different data tasks with CODAP in
this course

**Online Courses at Universities for Preservice
and Practicing Teachers** --- 10-30 participants

Teaching and Learning Statistical Thinking

Teaching and Learning Mathematics with
Technology

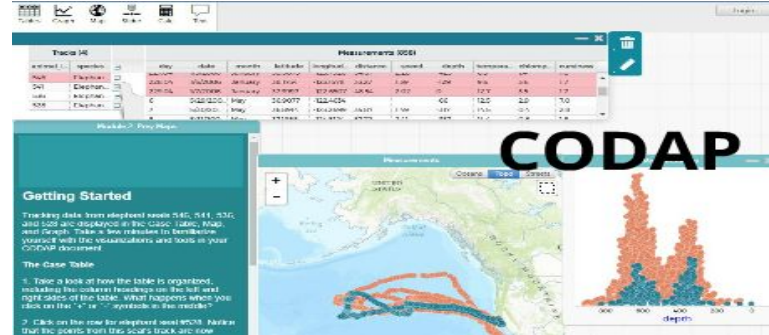
Teaching Mathematics with Technology

The logo for ESTEEM features the word "ESTEEM" in a stylized font. The letters "E", "S", "T", and "E" are red with grey horizontal bars. The letter "I" is a grey circle with a speech bubble above it containing a line graph. The letter "E" is a red smartphone icon. The letter "M" is a grey upward-pointing arrow. To the right of the logo, the text "ENHANCING STATISTICS TEACHER EDUCATION WITH E-MODULES" is written in a black, sans-serif font.

ESTEEM ENHANCING STATISTICS TEACHER EDUCATION WITH E-MODULES

1. Create online resources for statistics preservice teacher education
 - Expand CODAP functionality
 - Classroom video of statistics teaching
 - Rich multivariate data tasks
 - Video interviews with experts in statistics education
2. Design modules and approaches for using these resources
3. Implement resources and modules in undergraduate mathematics teacher education programs.

Experience with Open Tools and Resources



Core Design Principles for Data, Tools, and Tasks

- **Data** is multivariate, “large”, and sometimes messy
- **Data** contexts are engaging

- **Tools** facilitate transnumeration of data, in tabular and graphical form
- **Tools** promote visualization along with computations

- **Tasks** have multiple entry points for different levels of statistical sophistication
- **Tasks** provoke curiosity and help teachers envision different way of teaching

Today's Session:

Breakout Session 1: visit 2 stations (12 min each)

- Census at School data with TUVA
- Vehicle data with CODAP

Breakout Session 2: Choose 1 (12 min)

- World indicators with Gapminder
- Roller Coaster data with your favorite tool (or CODAP)

Discussion of tools and tasks

Examining Data of how participants engage with Vehicle data in CODAP

Wrap-up and discussion

Breakout 1

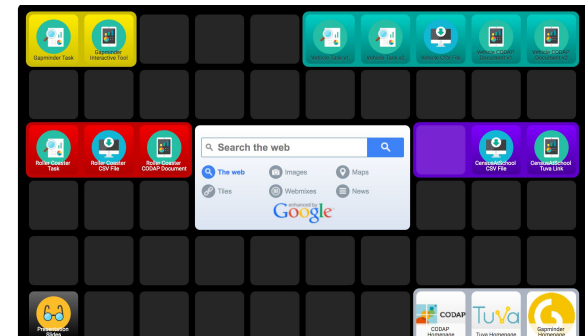
Visit two stations

- Census at School data with TUVA
- Vehicle data with CODAP

As you use the different tools, consider the pros/cons of using each tool and consider the way teachers might interact with these tools as both learners and teachers.

Link to Materials for Stations

<http://tinyurl.com/esteem-uscots2017>



Discussion of Data and Tools

What are the pros & cons of using different tools?

What do you anticipate might be learning **successes and struggles** related to teachers' development as data engagers and teachers?

Examine Participants' Engagement and Discussion of Vehicle Data in CODAP

Different discussion forum data

1. “Teaching Statistics” MOOC participants engaged with open version of task
2. Graduate students in Teaching and Learning Statistical Thinking course asked to engage and discuss EDA
3. “Teaching Math with Tech” MOOC participants discussion of “two graph” version of task---two different discussion threads with different foci

Dig into Forum Data

Each table gets a different sample of forum data

15 minutes to examine and discuss in small groups

Discussion of Forum Data--What did you notice?

What do teacher participants learn when they are shown the data?

How do those experiences impact their perspectives on teaching with bigger data, and what self-reported changes in practices are evident?

Wrap-up

What have we learned from TSDI MOOC classroom teacher participants?

Shift in perspective:

Computing and graphing ----> investigating and contextual connections

Major trigger for change in perspective is **explorations with real messy data!**

Impact in Teaching:

Use more real “messy” data with technology

Wrap-up

How can you integrate more data experiences in teacher preparation courses or workshops?