

Task Design for Statistical Habits of Mind

NCCTM

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Who are you?

- A. Math or Statistics Educator
- B. Math or Statistics Teacher Educator
- C. Educational Support (e.g. instructional coach, administration)
- D. Other

ASA-NCTM Joint Position Statement (2013)

“To successfully develop students’ statistical thinking, **teachers must have deep knowledge and understanding of statistics and the way that students learn statistics.** Consequently, the need is critical for high-quality preservice and in-service preparation and professional development that supports pre-K–12 teachers of mathematics, new and experienced, in developing their own statistical proficiency as well as their students’ understanding of and skill in working with statistics.”

<http://www.nctm.org/Standards-and-Positions/Position-Statements/Preparing-Pre-K-12-Teachers-of-Statistics/>



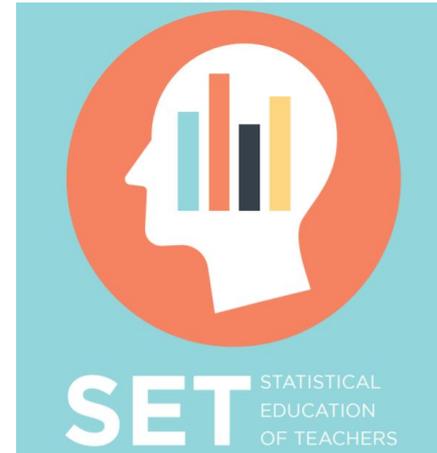
Statistical Education of Teachers Report (2015)

Teachers need courses/professional development to build strong statistical understandings, engage in the statistical investigation process, and build statistical habits of mind.

Report contains specific recommendations for courses and experiences

Calls for collaboration among statisticians, statistics educators, mathematics educators, and mathematicians.

<http://www.amstat.org/asa/files/pdfs/EDU-SET.pdf>



Are preservice mathematics teachers prepared to teach statistics?

Snapshot from cross-institutional study: 18 universities, 236 PSMTs

- On a HS content assessment (LOCUS)
 - Overall mean score of 68.61% (with high variability - st dev 14.06)
 - Some well prepared, many NOT!
- On a Confidence to Teach Statistics survey
 - Mean total score of 4.08 (scale of 1-6 - st dev 0.8)
 - Only “somewhat confident”
 - Many felt that they did NOT have experiences in methods courses to understand how to teach statistics - though they did get those for algebra and geometry!
 - Statistics courses were procedural and often did not use technology

Lovett & Lee, 2017

<http://journals.sagepub.com/doi/abs/10.1177/0022487117697918>



Materials Shared Today

- ESTEEM: Enhancing Statistics Teacher Education through E-Modules
 - Funded by NSF (DUE1625713)
 - hirise.fi.ncsu.edu/projects/esteem
- Materials for today's session
 - <https://tinyurl.com/ncctm18>

Website to Access Our Materials

hirise.fi.ncsu.edu

Mathematics vs. Statistics

How is statistics different from mathematics?

Think: 2 minutes

Pair: 2 minutes

Share!

Mathematics vs. Statistics

- Critical Role of **Context**
- Issues of **Measurement**
- **Variability and Uncertainty** of Conclusions

What makes a good task?

Considerations for Design and Implementation of Statistics Task (CDIST Framework)

<https://tinyurl.com/cdistframework>

Task Analysis

- ❖ Engage in one of the following task sets with a partner
- ❖ Discuss the following questions using the CDIST framework as a reference:
 - Discuss what it was like to engage in each task and the opportunities for statistical thinking for both tasks.
 - How do these tasks compare?
 - Does one of them offer more or better opportunities?

tinyurl.com/TAset1

tinyurl.com/TAset2

tinyurl.com/TAset3

tinyurl.com/TAset4

tinyurl.com/TAset5

Discussion

- Share your experience with engaging in your task set
- What are some common features of the tasks that offered nice opportunities for students to engage in statistical thinking?
- How did you find the CDIST framework to be helpful in analyzing the task sets?
- What ideas do you have for using materials you learned about today?
- As teacher educators, do you design task analyses or task sorts? What's important in designing them?