

# United States Conference on Teaching Statistics 2013

## Breakout session 3C: "Preparing to Teach K-12 Statistics: Assessing Teachers' Readiness"

Leigh Harrell-Williams  
[Lwilliams146@gsu.edu](mailto:Lwilliams146@gsu.edu)

Rebecca Pierce  
[rpierce@bsu.edu](mailto:rpierce@bsu.edu)

Lawrence Lesser  
[Lesser@utep.edu](mailto:Lesser@utep.edu)

Randall Groth  
[regroth@salisbury.edu](mailto:regroth@salisbury.edu)

M. Alejandra Sorto  
[sorto@txstate.edu](mailto:sorto@txstate.edu)

T. J. Murphy  
[murphytj1@nku.edu](mailto:murphytj1@nku.edu)



### SKIT REFLECTION QUESTIONS:

- o What does it mean to "be ready to teach"?
- o What does a teacher really need to know to "be ready"?
  - o Content knowledge
  - o Pedagogical knowledge
  - o Mix of both
  - o Other knowledge
- o How can we measure teacher readiness?



### Assessing Content Knowledge

#### **CAOS: Comprehensive Assessment of Outcomes in Statistics**

- <https://apps3.cehd.umn.edu/artist/caos.html>
- delMas, R., Garfield, J., Ooms, A., & Chance, B. (2007). Assessing students' conceptual understanding after a first course in statistics. *Statistics Education Research Journal*, 6(2), 28-58. [http://www.stat.auckland.ac.nz/~iase/serj/SERJ6\(2\)\\_delMas.pdf](http://www.stat.auckland.ac.nz/~iase/serj/SERJ6(2)_delMas.pdf)

#### **SCI: Statistics Concept Inventory**

- <http://cihub.org/resources/statistics>
- K. Allen, T. Reed-Rhoads, R.A. Terry, T.J. Murphy, & A.D. Stone (2008). Coefficient alpha: an engineer's interpretation of test reliability, *Journal of Engineering Education*, 97(1), 87-94.

#### **LMT: Learning Mathematics for Teaching**

<http://sitemaker.umich.edu/lmt/home>

### Classroom Assessments

#### **Japanese Lesson Study**

- Curcio, F. R. A (2002). *User's Guide to Japanese Lesson Study: Ideas for Improving Mathematics Teaching*. Reston, VA: National Council of Teachers of Mathematics.
- Groth, R.E. (2011). Improving teaching through lesson study debriefing. *Mathematics Teacher*, 104(6), 446-451.

#### **Writing prompts**

Groth, R.E. (2012). The role of writing prompts in a statistical knowledge for teaching course. *Mathematics Teacher Educator*, 1, 23-40.

### Assessing Self-Efficacy

#### **SETS: Self-Efficacy to Teach Statistics (Middle Grades & High School versions)**

- <http://www.causeweb.org/webinar/teaching/2012-08/>
- Harrell-Williams, L.M., Sorto, M.A., Pierce, R.L., Lesser, L.M., & Murphy, T.J. (in press). Validation of scores from a measure of teachers' self-efficacy to teach middle grades statistics. *Journal of Psychoeducational Assessment*.

#### **SELS: Self-Efficacy to Learn Statistics**

#### **CSSE: Current Statistics Self-Efficacy**

Finney, S. J., & Schraw, G. (2003). Self-efficacy beliefs in college statistics courses. *Contemporary Educational Psychology*, 28(2), 161-186.

### Assessing Attitudes

#### ***Statistics Attitude Survey (SAS)\****

Roberts, D. M., & Bilderback, E. W. (1980). Reliability and Validity of a Statistics Attitude Survey. *Educational and Psychological Measurement*, 40(1), 235–238.

#### ***Attitude Towards Statistics (ATS)***

Wise, S. L. (1985). The development and validation of a scale measuring attitudes toward statistics. *Educational and Psychological Measurement*, 45(2), 401–405.

#### ***Students' Attitudes toward Statistics (STATS)***

Sutarso, T. (1992). Students' Attitudes toward Statistics (STATS) (pp. 1–19). Presented at the Annual Meeting of the Mid-South Educational Research Association, Knoxville, TN, USA.

#### ***Survey of Attitudes towards Statistics (SATS)***

- <http://www.evaluationandstatistics.com/>
- Schau, C., Stevens, J., Dauphinee, T., & Del Vecchio, A. (1995). The development and validation of the Survey of Attitudes toward Statistics. *Educational and Psychological Measurement*, 55(5), 868-875.

### Assessing Beliefs and Practices

#### ***STI: Statistics Teaching Inventory***

- <https://www.causeweb.org/webinar/teaching/2010-11/>
- Zieffler, A., Park, J., Garfield, J., delMas, R., Bjornsdottir, A. (2012). The Statistics Teaching Inventory: A survey on statistics teachers' classroom practices and beliefs. *Journal of Statistics Education*, 20(1).

### Assessing Anxiety

#### ***Statistics Anxiety Rating Scale (STARS)***

- Cruise, R.J. & Wilkins, E.M. (1980). STARS: Statistical Anxiety Rating Scale. Unpublished manuscript. Berrien Springs, MI: Andrews University.
- Cruise, R. J., Cash, R. W., & Bolton, D. L. (1985). Development and validation of an instrument to measure statistical anxiety. In *Proceedings of the Section on Statistical Education* (pp. 92–97). Alexandria, VA: American Statistical Association.

#### ***Statistics Anxiety Inventory (SAI)***

Zeidner, M. (1991). Statistics and mathematics anxiety in social science students: Some interesting parallels. *British Journal of Educational Psychology*, 61(3), 319-328.

#### ***Statistics Anxiety Scale (SAS)\****

Pretorius, T. B., & Norman, A. M. (1992). Psychometric data on the Statistics Anxiety Scale for a sample of South African students. *Educational and Psychological Measurement*, 52(4), 933–937.

#### ***Statistics Anxiety Measure (SAM)***

Earp, M. S. (2007). *Development and Validation of the Statistics Anxiety Measure* (Unpublished doctoral dissertation). University of Denver, Denver. <http://iase-web.org/documents/dissertations/07.Earp.Dissertation.pdf>

#### ***Statistical Anxiety Scale (SAS)\****

Vigil-Colet, A., Lorenzo-Seva, U., Condon, L. (2008). Development and validation of the Statistical Anxiety Scale. *Psicothema*, 20(1), 174-80.

\* Note that multiple instruments use the acronym SAS.