

The ASA Section on Teaching of Statistics in the Health Sciences (TSHS) welcomes you!

**The Spring 2023 Webinar will start
in a moment**

“Successful approaches to teaching
statistical consulting”

A panel discussion led by Julia Sharp

**For more information about TSHS,
please visit our**

Website:

<https://community.amstat.org/tshs/home>

Blog:

<https://tshsblog.wixsite.com/main>

Resources Portal:

<https://www.causeweb.org/tshs/>

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Department of Biostatistics

University of Kentucky



Format of this Webinar

- Panelists will consider pre-planned questions
- Participants will have the opportunity to ask questions through the Q & A function

Tell us about the structure of a formal statistical consulting course that you have taught or would like to teach, including how many students you might be advising at one time.



What informal statistical training do students get at your institution?

Ryan P. response:

- Graduate research assistantships, very heterogeneous, some broad, “consulting”-based
- Consulting clinics: Medical students can receive one-on-one design and analysis consultation from our students

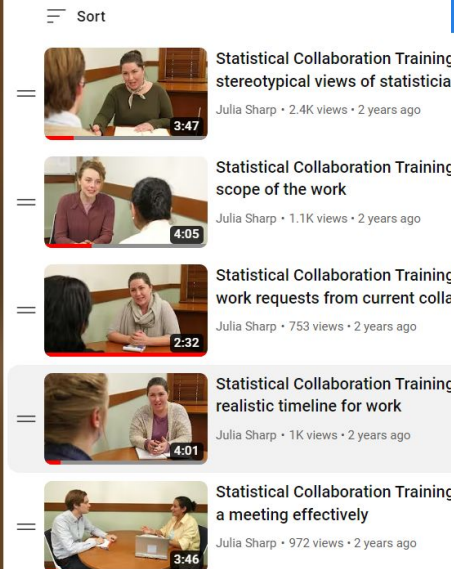
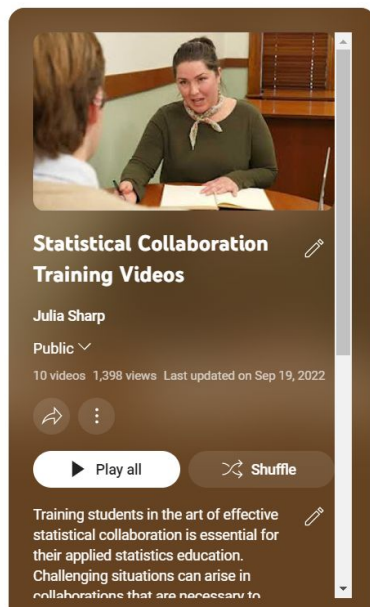
Alex H. response:

- Students intern with CBHDS to gain experience working on real world projects
- Walk-in hours
- SOM advising on research domain projects
- Committee work

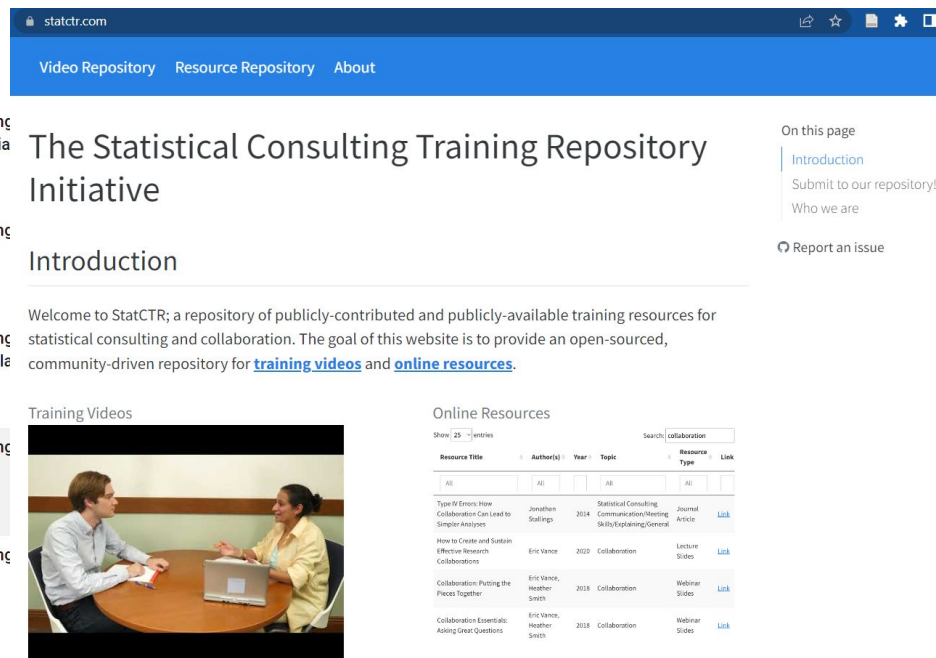


What are your favorite resources to share with students? How are these resources shared?

Emily G. response:



Ryan P:



What are your favorite resources to share with students? How are these resources shared?

Emily S. response:

- Derr's Statistical Consulting: A Guide to Effective Communication book, especially Chapter 3 (Nonverbal Communication) and Chapter 8 (Dealing with Difficult Situations)
- VanBelle's Statistical Rules of Thumb book (available free online)
- Wilson et al. (2017) "Good enough practices in scientific computing"

Alex H. response:

- Statistical Practice resources (Sharp, Griffith, Higgs 2021; Cressman and Sharp 2022; Peterson et al 2022; Broman and Woo 2018; Kotz et al 2005; Kass et al 2016; Azad 2015)
- ASA Ethical Guidelines for Statistical Practice (2022)
- Nature Methods Points of Significance column

When we think about our successes, it might also be helpful to think about “not-so-successful” teaching approaches or collaborations. What strategies have you tried that were not so successful?

Emily G. response:

- “Canned” projects with real questions and data, but no client
- Light scaffolding or structure through the semester (early mistake while revamping the course)

Alex H. response:

- Not vetting collaborative projects with outside clients prior to sharing with students
- Teaching remotely



What is a limiting factor for you in teaching statistical consulting?

Emily S. response:

- Multidisciplinary PhD program = students come to the consulting course from different backgrounds/levels of statistical knowledge
- The collaborative lab I run is a great source of consulting projects, but the funders of this lab generally don't want the work done by students

Emily G. response:

- Class size– it's easy to get overwhelmed with a large (>35) class or multiple sections and lose track of individual projects



What resources would you like to have to contribute to the success of training the next generation of collaborative statisticians?

Emily G. response:

- More! There is a lot of good stuff out there, but I would love more of it
 - Textbooks
 - Examples
 - Videos and scripts
 - Communication skills (written and oral)

Ryan P. Response:

- A bank of recorded “real” consultations (and discussion q’s)
- Next-gen tools for team science
 - Real-time data exploration
 - Communicating uncertainty
 - Interactive visualizations
- Balancing deadlines and scope
- Reproducibility



How can statistical consulting resources complement “on-the-job” training? How does this type of training benefit your students and your institution?

Ryan P. response:

- Students are used to talking with statistically-minded individuals, rather than non-statisticians.
- “On-the-job” lessons in such interactions are often learned the hard way. This creates friction.
- Coursework + training resources in consulting reduces this friction!

Emily S. response:

- In many Statistics programs, consulting experiences are students’ only opportunities to struggle with the realities of working with real data
- In our course, students work on projects alongside a full-time staff biostatistician. They perform analyses independently which acts as double programming – a win-win!

What is one key component that everyone should take away from this webinar to consider in their own statistical consulting teaching?

Alex H. response:

- Teach the students to listen, be thoughtful, plan prospectively, and practice good science: visualize data, generate Table 1, etc...do NOT jump right into a complex model.



Emily G. response:

- To quote a student, “Real data are so annoying!” meaning that real experience is vital
- Consulting skills are useful in situations beyond consulting, involving leadership communication, diplomacy, etc.



In Summary



Resources

- Derr's Statistical Consulting: A Guide to Effective Communication book, especially Chapter 3 (Nonverbal Communication) and Chapter 8 (Dealing with Difficult Situations)
- VanBelle's Statistical Rules of Thumb book (available free online)
- Wilson et al. (2017) "Good enough practices in scientific computing"
- Julia L. Sharp, Emily H. Griffith & Megan D. Higgs (2021) Setting the Stage: Statistical Collaboration Videos for Training the Next Generation of Applied Statisticians, Journal of Statistics and Data Science Education, 29:2, 165-170.
- Ethical Guidelines for Statistical Practice (2022). Prepared by the Committee on Professional Ethics of the ASA. Approved by ASA BOD February 1, 2022.
- Cressman, K. A., & Sharp, J. L. (2022). Crafting statistical analysis plans: A cross-discipline approach. *Stat*, 11(1), e528. <https://doi.org/10.1002/sta4.528>
- Peterson, R. A., Hochheimer, C. J., Grunwald, G. K., Johnson, R. L., Wood, C., & Sammel, M. D. (2022). Reaping what you SOW: Guidelines and strategies for writing scopes of work for statistical consulting. *Stat*, 11(1), e496. <https://doi.org/10.1002/sta4.496>

Resources

- Broman K, Woo K (2018). Data Organization in Spreadsheets. The American Statistician. Volume 72, 2018; Issue 1: Special Issue on Data Science.
- Kotz, S., B. Campbell, N. Read and B. V. Balakrishnan (2005), *Encyclopedia of statistical*
- Kass RE, Caffo BS, Davidian M, Meng X-L, Yu B, Reid N (2016) Ten Simple Rules for Effective Statistical Practice. PLoS Comput Biol 12(6): e1004961.
- Azad, K. (2015), Math, Better Explained: Learn to Unlock Your Math Intuition, CreateSpace Independent Publishing Platform.
- *Nature Methods'* Points of Significance column on statistics explains many key statistical and experimental design concepts.
<https://www.nature.com/collections/qghhqm/pointsofsignificance>
- List of great resources:
<https://data.library.virginia.edu/statlab/best-practices-for-statistical-data-analysis/>



Thank you for attending this TSHS webinar!

This webinar has been recorded and will be posted
<https://community.amstat.org/tshs/home>

For more information about TSHS, visit our blog
<https://tshsblog.wixsite.com/main>

Need real-world biomedical datasets for teaching?
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