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Teaching Tips: A Compendium of Conference Presentations on Teaching, 2020-21



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Division 2 Programming at the Annual

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Building Students Statistical Skills Using Passion-Driven Statistics “Boot Camp” Model

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Abstract

The COVID-19 pandemic has gifted us a pivot point, an opportunity, in which we can consider ways to do things differently than we have "always" done them. Traditionally, students view statistics as an obstacle to overcome, rather than an opportunity to pursue their own interests and passions. The Passion-Driven Statistics curriculum challenges this viewpoint by exposing students to a meaningful and powerful data analysis experience during a 3-day "boot camp" or as a short project over a few weeks. This provides major student outcomes (e.g., an empirical poster presentation) with minor faculty investment (e.g., time, technology). Our model can be quickly personalized to meet the needs of you and your students, which is especially important during moments of an unexpected pivot. In addition to face-to-face, the outcomes can be met in a fully online, remote, or hybrid environment, making this model suitable for use in a variety of contexts. The "boot camp" model could serve as a way for your student lab members to gain research experience, skill-building workshop for your psychology club students, or project for a content-based course.

This NSF-funded (DUE #1820766) model is a multidisciplinary, project-based curriculum that supports students in conducting original research, asking original questions, and communicating methods and results using the language of statistics. The course attracts higher rates of under-represented minority (URM) students compared to a traditional math statistics course (Dierker et al., 2015) and higher rates of female and URM students compared to an introductory programming course (Cooper & Dierker, 2017). Students reported the course more rewarding, were more likely to accomplish more than expected, found the course more useful than other courses, increased confidence in working with data, increased interest in pursuing advanced statistics courses, and received more individualized support than other courses (Dierker et al., 2018).

Workshop Resources

To access the recordings for this workshop, handouts and supplemental resources visit this [shared Google folder](#). Video Part 1 is an Overview of Passion-Driven Statistics, and Part 2 is the Boot Camp Workshop.

Software

Any software can be used for the short project. We have resources for SAS, R, SPSS, Stata, and Python. We recommend you use a software you are familiar with and the students can access for free.

If you are not familiar with a software, are interested in learning a new one, or what you know the students cannot access for free we recommend SAS. It is a free cloud-based software. For any of the code-based software, we have students copy the code from the digital handout and paste it into their code editor to then edit. To develop your software skills, we recommend watching the lecture videos linked in the [PDS eBook](#).

Real Data

Any real data that is clean, has a large number of variables and participants, and has a good code book can be used with the model. We do have a number of data sets we recommend on varying topics for use with Passion-Driven Statistics.

Time

You can approach this short project as an intensive 3-day workshop, a couple of hours over two weeks, or spread it out throughout the semester. We recommend 15 hours of student contact with the short project to allow time for understanding, developing their idea, analyzing their data, and developing their poster for presentation. With that amount of class time dedicated to the project, students will not need time outside of class to work on their project if they work during class.

If you are not doing an intensive workshop, we recommend you have students start working on their topic, accessing the software, loading the data, and other small components early in the semester or a few days before with due dates so they are ready to go when you start the project. Then as you gradually work on the project have students turn in the steps as they go to keep students on track.

During Class

We recommend you demonstrate to the class the steps in the handout with your chosen software using either the handout example or another of your liking. Give students time to complete that step with their project while you circulate around the room answering questions. Then demonstrate the next step and have students complete it working your way through the handout. We encourage students to help each other and to share with each other informally and to the class about their project throughout the process.

Poster

The culminating experience is the 5-to-10-minute poster presentation. We find without it the students do not come full circle in their understanding of the content or realize how much they have accomplished.

Instructor Resources

Email Kristin.flaming@gmail.com to request access to our instructor resources. We have many partners that have approached the short project in different ways. It is very flexible.

Workshops

We hold regular workshops intended for instructors at all levels, regardless of discipline-specific training (e.g. math, statistics, biology, political science, psychology, sociology, education, epidemiology, geology, etc.). Workshops include very brief demonstrations focused on the nuts and bolts of supporting project-based experiences. Presenters take an interactive approach by guiding attendees through condensed versions of key assignments in the Passion-Driven Statistics model to help provide the students perspective. Workshops include a discussion of resources and the instructor's role to allow for a more behind the scenes view. Feel free to contact either kristin.flaming@gmail.com or ldierker@wesleyan.edu for more information or visit [The Passion-Drive Statistics website](#).

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A complete list of publications, blogs, general audience articles, book chapters and press from partner schools please visit the [Passion Driven Statistics website's publication page](#).