

Supporting Undergraduate Research Skills

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Preparing to Teach Workshop, July 27, 2019

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<https://github.com/mine-cetinkaya-rundel/preparing-to-teach>

- Why are research skills important?
- Research opportunities
- Infrastructure for research

ASA Guidelines for Undergraduate Programs in Statistics (2014)

- Graduates should be expected to write clearly, speak fluently, and construct effective visual displays and compelling written summaries
- They should demonstrate ability to collaborate in teams and to organize and manage projects
- They should be able to communicate complex statistical methods in basic terms to managers and other audiences and visualize results in an accessible manner
- There is pedagogical value in having students practice communication to identify gaps in their understanding.
- Communication skills need to dovetail with students' technical and statistical knowledge: excellent communication of inappropriate or incorrect analyses is counterproductive.

Why are research skills important?

AAC&U High impact practices
(<https://www.aacu.org/leap/hips>)

Collaborative Assignments and Projects Collaborative learning combines two key goals: learning to work and solve problems in the company of others, and sharpening one's own understanding by listening seriously to the insights of others, especially those with different backgrounds and life experiences. Approaches range from study groups within a course, to team-based assignments and writing, to cooperative projects and research.

Why are research skills important?

AAC&U High impact practices
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Undergraduate Research Many colleges and universities are now providing research experiences for students in all disciplines. Undergraduate research, however, has been most prominently used in science disciplines. With strong support from the National Science Foundation and the research community, scientists are reshaping their courses to connect key concepts and questions with students' early and active involvement in systematic investigation and research.

Why are research skills important?

AAC&U High impact practices
(<https://www.aacu.org/leap/hips>)

Undergraduate Research (cont.) The goal is to involve students with actively contested questions, empirical observation, cutting-edge technologies, and the sense of excitement that comes from working to answer important questions.





National Science Foundation
WHERE DISCOVERIES BEGIN

NSB

Research Areas

Funding

Awards

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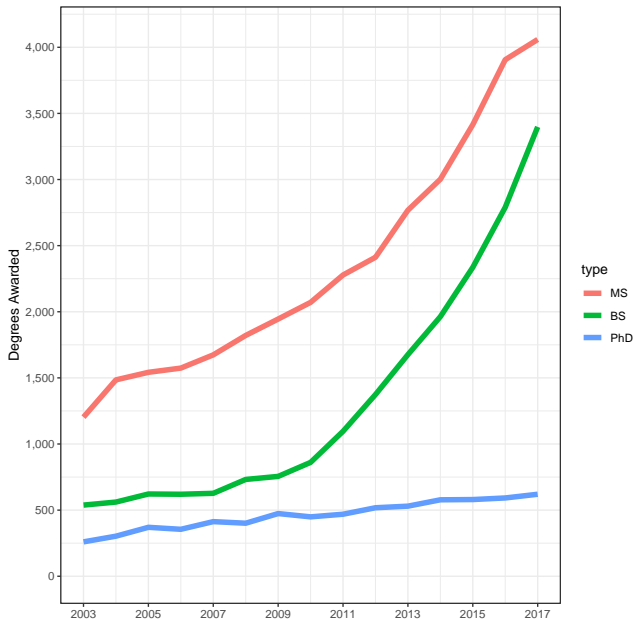
REU Sites

REU Sites: Mathematical Sciences

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Statistics Graduates: How do we Scale Up?



- USPROC (Undergraduate Statistics Project Competition)
<https://www.causeweb.org/usproc>
 - USCLAP Undergraduate Class Project Competition
 - USRESP Undergraduate Research Project Competition



What Is ASA
Datafest?

Hosting an Official
ASA DataFest

What Is ASA DataFest?

The American Statistical Association (ASA) DataFest is a competition where undergraduate students work around the clock to analyze a large data set.

DataFest was founded at UCLA in 2011. Each year, students from across the country are invited to participate. In 2012, over 100 students gathered for 48 intense hours to analyze a large data set.

Infrastructure for Research Projects (quick demos as time is available)

- RPubS.com
- github.com
- thesishdown



RPubs brought to you by RStudio

Easy web publishing from R

Write R Markdown documents in RStudio.

Share them here on RPubs. (It's free, and could be you.)

Get Started

Data

Analysis

References

Appendix

UN Votes

Mine Çetinkaya-Rundel

2018-07-28

Let's take a look at the voting history of countries i data from the **unvotes** package. Additionally, we w the analysis, and the **DT** package for interactive di

```
library(tidyverse)
library(unvotes)
library(lubridate)
library(DT)
```

Real-world tools, engaged students

GitHub Education helps students, teachers, and schools access the tools and events they need to shape the next generation of software development.



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← → ↺ GitHub, Inc. [US] | <https://github.com/ismayc/thesisdown>

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An updated R Markdown thesis template using the bookdown package

🕒 **63** commits 🌿 **1** branch 🏷️ **0** releases

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How to Sustain?

- Faculty development (eCOTS, USCOTS, CAUSE, JSM, DataCamp, webinars)
- Regional affiliations (for joint undergraduate conferences)
- Local acknowledgemnt (value of creating these opportunities for students)
- More support for REU's to address dramatic growth in undergraduate statistics and data science majors

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