

IOWA STATE UNIVERSITY

Department of Statistics

Outreach Opportunities for Statistics and Data Science Programs

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Outline

- Outreach activities at Iowa State University
Department of Statistics
- Outreach activities at your institution
- Discussion



Purpose

- Making connections in the community
- Helping local educators and students
- Raising awareness and growing our program



Outreach at Iowa State University

- Our recent activities include:
 - Hosting eCOTS Regional Conference (Spring 2022)
 - Lead an activity at an ISU Go Further Conference for young girls (Fall 2022, Spring 2023)
 - Hosting AP[®] Statistics Mock Exam (Spring 2023)



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Outreach at Iowa State University

- Upcoming activities include:
 - Creating Research Experience for Undergraduate (REU) Students: Summer research program geared towards students at minority-serving institutions (Summer 2023)



eCOTS Regional Conference 2022

- Hosted May 2022 in-person at ISU
- 48 attendees, predominately:
 - community college instructors (18),
 - liberal arts institutions (12), and
 - high school teachers (9)



eCOTS Regional Conference: Activities

- Keynote speaker: Barb Barnett (AP[®] Statistics Chief Reader)
- Organized group discussions
 - E.g., high school statistics, online teaching
- Breakout sessions
 - E.g., DEI in data science and statistics, Statistical significance and p-value controversy
- Jeff Witmer's "What might we do differently in Stat 101" virtual session live

eCOTS Regional Conference: Feedback

- “I enjoyed getting together with individuals who are all looking to improve their teaching! It was great to exchange ideas and just meet people again.”

- “I don't have any opportunities to talk to high school teachers about Data Science. This allowed for that experience. Additionally, hearing real, normal faculty, talking about their struggles with DEI was... comforting?”

- “I also enjoyed the discussion on DEI. I had not really previously thought about how data sets could have the social and cultural implications that they may, so now I feel I will be better aware of the message the data sets I choose to use may communicate.”

Go Further Conference

- Six 45-minute sessions
 - Two sessions in fall 2022
 - Four sessions in spring 2023
- 25-30 8th-grade female students per session
- 2-6 ISU instructors and student helpers per session



Go Further Conference: Activity

- Original Activity by Doug Tyson¹, modified for this audience.
- Joy Milne claims she can smell if someone has Parkinson's disease.
 - Joy smelled 12 shirts (six with and six without).
 - Joy identified which shirts were worn by someone with Parkinson's (11 of 12 correct).
- Students replicate Joy's study.
 - Students experience a hands-on simulation.
 - Students also see results from a larger computer simulation.
 - Students make conclusions based on the results of these simulations.¹⁰



Go Further Conference: Feedback

- "I think that discussing whether we believed the woman that could smell Parkinsons was a fun thing. That topic also lead us to think of other possibilities of people being able to smell other diseases."

- "I think they did a good job explaining something that I have never heard of before and the activity was very fun and interesting."

- "It was really fun and interesting, and I never got bored."

- "Something I wasn't expecting but I definitely enjoyed"

AP[®] Statistics Mock Exam

- Partnership with Clemson University
- April 22, 2023
- 29 Attendees
 - 5 ISU faculty and staff
 - 2 ISU graduate students
 - 5 members of the AP[®] Leadership
 - 4 high school teachers
 - 13 high school students



AP[®] Statistics Mock Exam: Student Activities

- Experienced a realistic AP[®] Statistics Exam (including both free-response and multiple-choice questions)
- Received scores and relevant feedback on their answers for the exam
- Experience statistics in action in “solving a murder mystery.”



AP[®] Statistics Mock Exam: Teacher Activities

- Experienced reading of a Mock AP[®] Statistics Exam
 - Received training on how to score free-response questions based on a scoring rubric
 - Scored student responses
- Held discussions with members of the AP[®] Statistics leadership



AP[®] Statistics Mock Exam: Student Feedback

- “it really showed me where I was struggling...”

- “The mock exam was highly representative of what the actual test looked like, and the testing atmosphere was similar, though slightly more relaxed than an actual AP exam. The immediate feedback was super helpful for studying, and the activities, while we waited, were fun and engaging.”



AP[®] Statistics Mock Exam: Teacher Feedback

- “As a teacher, I found the interactions with the Chief Reader, Assistant Chief Reader, and the question leaders to be a valuable learning experience. The discussions of the development of the scoring rubrics with these individuals provided invaluable insight into how I can improve my student's approach to answering items on the exam.”

- “I have not been an AP grader, so I enjoyed the opportunity to emulate and participate in the grading discussions and experiences.”

- “I would welcome faculty, graduates, etc., to come to our classrooms and talk about your programs. It could even be a conversation that not only highlights your programs but also advertises for the upcoming Mock Exam.”

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Research Experience for Undergraduates (REU)

- Collaborative effort between the Department of Statistics and CSAFE (Center for Statistical Analysis of Forensic Evidence)
- 6 REU students (2 from ISU, 4 from outside), 3 ISU faculty, 2 ISU graduate students
- 3 distinct research projects over the summer
- Rely on existing ISU infrastructure for help with accommodating these students



Discussion

- Form small groups
 - Aim for distinct institutions within groups
- Introduce yourselves to your small group and identify someone to take notes and another to share with the larger group
- For the following slides:
 - Discuss for 3-5 minutes in your small group
 - Share with the larger group



1. Goals and Purpose of Outreach (Discuss 1-2)

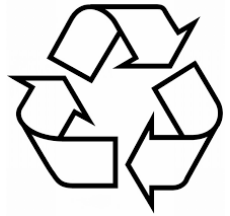
- 1a: What has your institution done related to outreach, or what you would like to do?
- 1b: What is your purpose or goal related to outreach?
- 1c: On a scale from 1 to 5, with 5 meaning very important, how important do you consider outreach as a means to grow participation and interest in our field? Why?



2. Outreach Activities (Discuss 2)

- 2a: What outreach activities have been most/least successful? Do you have an idea why?
- 2b: If you had to choose 1 outreach activity, which one would it be and why?
- 2c: What challenges have you experienced in your outreach efforts?
- 2d: What is an outreach experience that has translated into a continued relationship and what do you think allowed for this to happen?

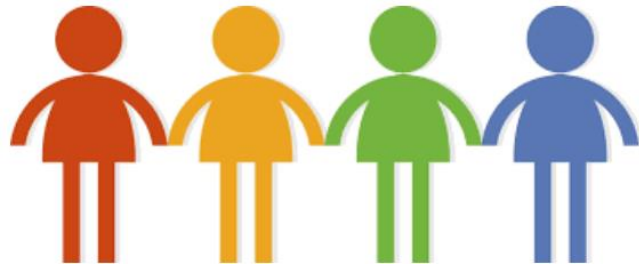
3. Feasibility and Sustainability (Discuss)



- 3a: What factors affect the feasibility of outreach at your institution?
- 3b: How are outreach activities sustained in times of adversity?

4. Collaborations (Discuss 1-2)

- 4a: What benefits could result from collaborations across institutions?
- 4b: What are the difficulties with collaborating across institutions?
- 4c: What would be an effective way of sharing resources across our community, that is, what infrastructure is needed?



5. Branding Statistics (Discuss)

- 5a: What do you think it takes to move away from us being a "found discipline?"
- 5b: Data Science experienced, and still is experiencing, considerable growth and popularity – why is or was this not possible in Statistics?



Go-round

- Share 1 of the following:
 - What is your most impactful takeaway from today's session?
 - What action are you going to take to implement outreach?
 - What is something you did not consider before today's discussion?



Questions?

Thoughts?

Collaborating

- Are you interested in collaborating on the AP[®] Statistics Mock Exam?
- Would you like to be added to a Google Folder to share outreach materials with others?
- If yes, fill out this short survey:



<https://go.iastate.edu/EE55HF>



Activity Information

- eCOTS (2022):
 - <https://www.stat.iastate.edu/event/2022/ecots-2022-regional-conference>
- WISE Conference:
 - ISU: <https://www.stat.iastate.edu/news/2022/dei-committee-participates-go-further-conference-8-10th-grade-girls>
 - ¹Doug Tyson's Smelling Parkinson's Activity: <http://mrtysonstats.com/apstats/apstats.html>
- AP[®] Statistics Mock Exam:
 - ISU: <https://www.stat.iastate.edu/event/2023/apr-statistics-mock-exam>
 - Clemson University:
<https://www.clemson.edu/science/academics/departments/mathstat/outreach/ap-stat.html>
- Summer REU:
 - <https://www.stat.iastate.edu/news/2023/statistics-research-experience-undergraduate-students>