How to Teach an Introductory Statistics Course

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Let's Look at Some Data

- Non-politics introductory statistics courses in social sciences:
  - 5 year average: 2008/09–2013/14
  - ECO 302, PSY 251, SOC 301, WWS 200, WWS 332

	Lectures	Assignments	Readings	Precepts	Overall
Statistics	3.2	3.3	3.1	3.6	3.1
All PU courses	3.8	3.7	3.7	4.0	3.9

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- Politics introductory statistics courses:

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POL 245 (2014)	4.4	3.9	3.5	3.9	4.3
POL 245 (2015)	NA	4.0	3.4	NA	4.3
POL 345 (2011)	4.0	3.8	3.7	4.2	4.1

Why Teaching Introductory Statistics Courses is Hard

1 Students are not interested in statistics:

	Professor	Distribution Requirement	Departmental	Certificate Program	General Interest
Statistics	0%	20%	71%	3%	6%
All PU courses	6%	12%	32%	7%	42%

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"as a person not naturally inclined towards statistics and probability, I don't feel at all qualified to pass judgement on how the course might have been improved."

Two Strategies

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- Hands-on instruction in computer labs
- Outside-of-classroom assistance

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3. Bring these experiences back to the regular semester classes and have an impact beyond Princeton

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- Module format:
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- Assignments:
  - Weekly problem sets and one take-home midterm
  - Short non-graded pre-class assignments
  - One collaborative final project and group presentation
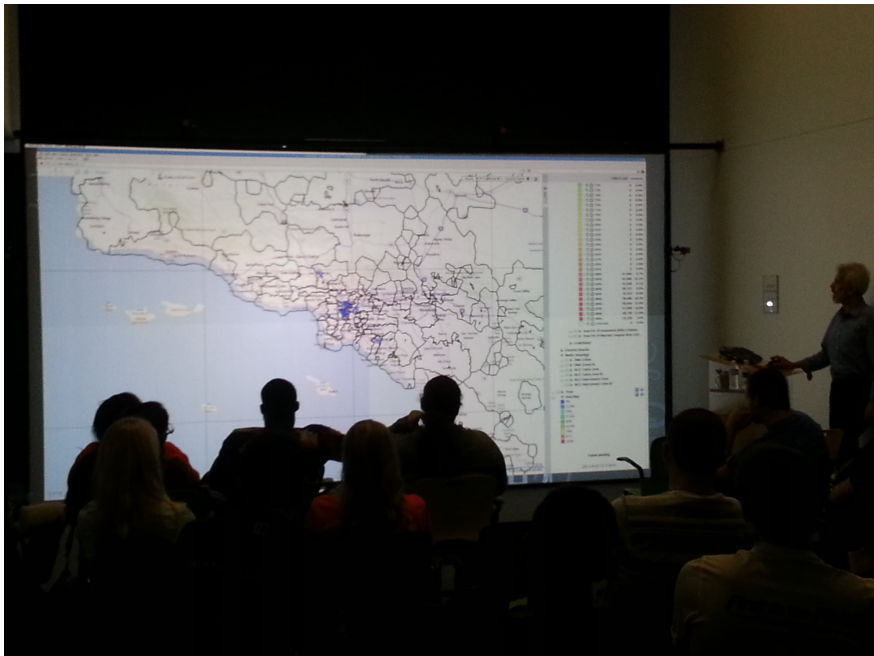
Results and Next Steps

- Students' feedback:

  "The course was a lot of fun and really interesting and I plan on taking the next level of the course."

  "I really enjoyed this course, and that is why I want to take POL345."

  "I felt it gave me a very true sense of what to expect at Princeton."

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- Increasing enrollment in POL 346: a single digit ⤳ 28

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- Diverse students in POL 345 this semester
- Increasing enrollment in POL 346: a single digit $\rightsquigarrow$ 28
- Next steps:
  1. Completely flip the course

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- Increasing enrollment in POL 346: a single digit ⤳ 28
- Next steps:
  1. Completely flip the course
  2. Offer the course during the regular semester

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- Next steps:
  1. Completely flip the course
  2. Offer the course during the regular semester
  3. Develop a curriculum for a sequence of statistics and machine learning courses as part of the SML certificate program