

Piloting a new assessment tool for data science education researchers (4 min LT)

- Collaborative project with colleagues at Duke, UMN, UC London

Background and context

- Introductory Data Science is both growing and spreading quickly
- There is a need for quality research assessment tools developed and validated for general use across institutions and programs in order to compare and contrast curriculum interventions, pedagogical innovations, etc.

Objectives

- This project has set out to develop a research assessment to measure data science reasoning outcomes for IDS students before and after a first course

Method

- team examined syllabi and resources in use by experienced IDS instructors
- drafted and revised an assessment tool
 - (almost certainly too many items for the final assessment...)
 - 48 candidate items aligned with the core knowledge, skills, and abilities—e.g., interpreting data visualizations, algorithmic thinking, basic inference/prediction, model evaluation/interpretation, data prep, and more
- conducted structured interviews
 - experienced data science instructors with expertise in statistics education, computer science education, and/or educational measurement.
 - interviews invite both **holistic** feedback (e.g., essential topics for a data science assessment) as well as a **detailed critique** of each item and its contribution

Current state of the project

- we think the draft assessment has fared well in our interviews with experienced IDS instructors—i.e., who have taught an undergraduate IDS course multiple times
- interested in additional perspective from CS colleagues with experience teaching IDS courses
- Seeking participants to classroom test
 - assessment can be made available by request to those interested

Still some challenges

- core curriculum for IDS
 - a challenge to balance where to invest in depth vs breadth for a first course... particularly where there is not yet a consensus curriculum
 - everything can feel important
- seeking insight about best practices for language agnostic assessment of algorithmic thinking (i.e., for data preparation / analysis)
 - e.g., both Python & R are popular tools among data scientists
 - we're concerned that parallel assessment forms invites some psychometric issues
 - what to do about other languages in future?!
 - pseudo-code has thorny issues of its own

Connect if you're interested

- We'd love to benefit from additional perspectives on the work
- Also, if your institution has an undergraduate IDS course (whether you teach it or not), please get in touch with me—we're very much interested in colleagues to share input and/or field test