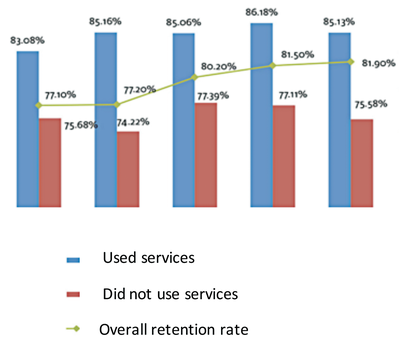
TOOLS TO HELP US PREDICT STUDENT SUCCESS

- We will pilot the use of Civitas Illume in Spring 2017. This tool helps us identify at-risk students, challenging courses, and the impact of academic interventions
- How can it help?
  - Measuring the impact of intervention often involves "selection bias"
  - For example, would students visiting the writing center succeed, regardless?
  - If so, how do we isolate the impact to at-risk students?
- Examples are from two different public four-year institutions

A common problem with measuring the impact of interventions is "selection bias." For example, if students who voluntarily go to the writing center persist at higher rates or earn higher grades , is it because they are high effort students or because the writing center improves outcomes?

WRITING CENTER IMPACT

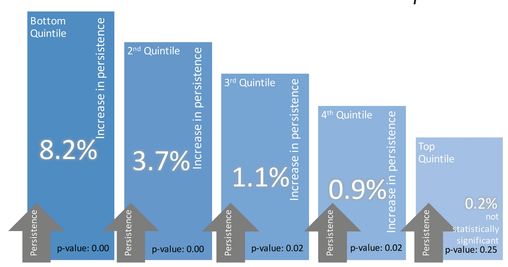
"Aren't the types of students who voluntarily go to tutoring services more likely to persist? Isn't there selection bias?"



PPSM models give us the ability to more precisely measure the impact of interventions like the writing center. In the example below, PPSM models from a public four-year university showed the biggest impact of the writing center was felt by student in the bottom quintile of performance.

WRITING CENTER IMPACT

The lift in persistence increases for students with lower persistence predictions.



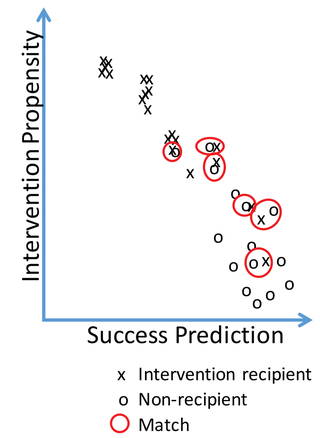
Approximately 2300 matched students measured in each quintile.

One common workaround for selection bias is "random assignment." That doesn't work in higher education for reasons of policy and principle (we wouldn't want to randomly restrict access to the writing center). A statistical technique becoming commonly used to mimic random assignment is prediction based propensity score matching. Civitas takes advantage of PPSM methods to create a control group and minimize selection bias.

CREATING A CONTROL GROUP WHEN THERE WASN'T ONE

Prediction-based Propensity Score Matching (PPSM)

- Each pilot student is assigned a propensity score based on their features/ covariates and success predictions scores, and a control student is found by finding a non-pilot student with the best match score
- Facilitates apples-to-apples comparison (we're comparing students that both have similar characteristics as well as persistence probability)
- Improves statistical power by lowering the minimum detectable effect size
- Improves targeting through subpopulation drill-down analysis



Using this technique, Civitas gives us the ability to assess the impact of a wide range of academic interventions on both an individual and relative basis. This allows us to improve student outcomes and improve interventions where needed.