



Make a statistically significant difference in education.

# Putting Student Success Initiatives on the Map: A framework to inform effectiveness and efficiency

*Greenville Technical College*

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- One of the largest public, two-year institutions in SC
- One of 16 State Technical Colleges
- Fall 2020 Headcount = 10,533
- 61% Female                      39% Male
- 58% Part-Time                  42% Full-Time
- Average Age = 24 years old
- Graduation Rate: approximate 3 year grad rate: 12%
  - about 2x that of African American/Black Males. (Psst! I think we might have an equity issue.)

# We all love a good success initiative, but...

- What's the Problem?
  - How effective is my program and for whom? (equity gaps)
  - How efficient is my program? (\$)
  - Where is there room for improvement in each measure?
  - How is my program improving over time?

# What we wanted to do

- Measure Effectiveness: How many more students are persisting than would have without participating in the initiative?
- AND...
- Measure Efficiency: How much are we spending per student served?
- Plot them on an X-Y axis = ROI MAP

# Data Sources

- Success Initiative participant lists
  - Success Initiative eligibility criteria
  - Student Information System (Colleague)
  - Blackboard (LMS)
  - Operationally focused budget data
- } Feeds Predictive Analytics tool

# Analysis

- Civitas Illume Impact tool
  - Prediction-based Propensity Score Matching (PPSM)

# PPSM (Prediction-based Propensity Score Matching)



*Persistence Prediction*



*Propensity Score*

Matching a student who participated in an initiative with a similar student who did not participate in the same initiative. This matching occurs on two dimensions:

1. Similar persistence probabilities of the students (persistence prediction) and
2. Similar probability of taking part in the initiative in question (propensity score)



# Illume Impact: PPSM Model

Prediction-based,  
Propensity Score  
Matching



## MOST PREDICTIVE VARIABLES

- Terms completed
- Average credits attempted per term
- STEM
- Student type: Transfer, first time, etc.
- Modality: Credits online/offline/blended
- High school info

- Participants
- Comparison Group
- Match

PROBABILITY  
INTERVENTION

SUCCESS PREDICTION



MATH COURSE REDESIGN

0%  
LIFT



MATH TUTORING

3%  
LIFT



WRITING CENTER

8%  
LIFT

1

IDENTIFYING ELIGIBLE STUDENTS

2

SELECTING THE RIGHT DATA VARIABLES

3

DEVELOPING PERSISTENCE & PROPENSITY SCORES  
(BEHIND THE SCENES)

4

GETTING TO APPLES-TO-APPLES COMPARISON  
(PARTICIPANT & COMPARISON GROUPS)

5

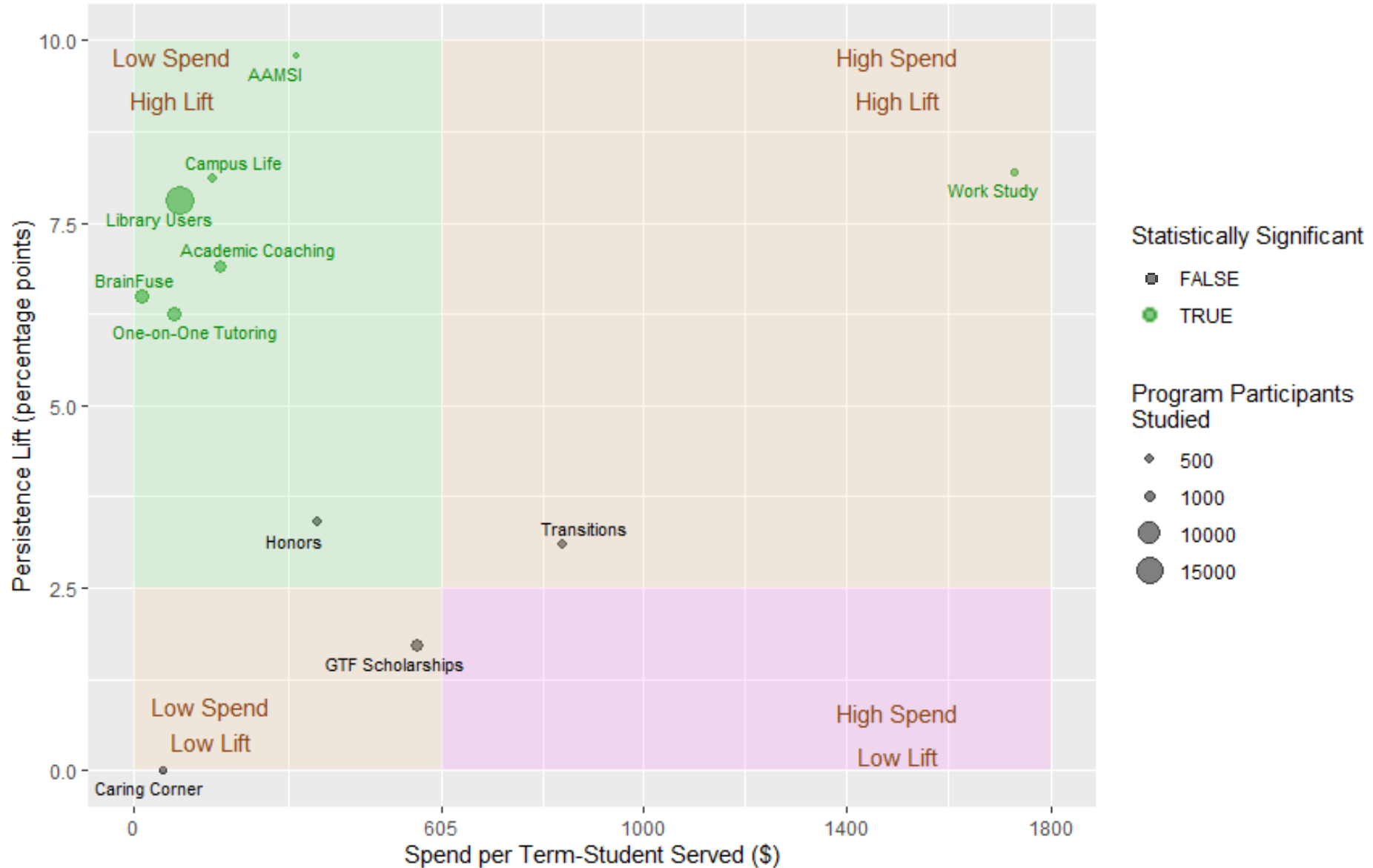
ASSESSING THE IMPACT



# Analysis

- Civitas Illume Impact tool
  - Prediction-based Propensity Score Matching (PPSM (pat pend))
- AND...
- Incorporate Budget/Expense data to get cost per student served

# Success Initiative ROI Map



# Results – Going Deeper

↑ 6.9%  
+/-3.0%

Lift in Persistence

< 0.01

P-Value

👤 1,791

Analyzed Participants

← Back

## Academic Coaching FY17-FY18

Does attending one or more Academic Coaching Sessions improve persistence?

Initiative Impact

Matching Details

Data Details

### Impact by Student Group

📄 Export Raw Data

Overall Summer 2017 Fall 2017 Spring 2018 Summer 2018 Fall 2018 Spring 2019 Summer 2019

STUDENT GROUP ▲	ANALYZED PARTICIPANTS	P-VALUE	PERSISTENCE LIFT
Overall	1,791	< 0.01	6.90% +/- 3.0%
Completed Terms: 0 Terms	342	0.03	7.02% +/- 6.3%
Completed Terms: 1-3 Terms	788	< 0.01	7.76% +/- 4.7%
Completed Terms: 4+ Terms	660	0.02	5.85% +/- 5.0%

STUDENT GROUP ▲	ANALYZED PARTICIPANTS	P-VALUE	PERSISTENCE LIFT
			0
Prediction Percentile: Bottom Quartile	481	< 0.01	10.86% +/- 6.2%
Prediction Percentile: Second Quartile	541	< 0.01	11.94% +/- 5.6%
<small>Not statistically significant</small> Prediction Percentile: Third Quartile	458	0.84	0.61% +/- 5.8%
<small>Not statistically significant</small> Prediction Percentile: Top Quartile	308	0.69	1.20% +/- 5.9%
Race: Black or African American	646	0.01	6.34% +/- 5.1%
Race: Unknown	214	0.03	9.75% +/- 8.8%
Race: White or Caucasian	840	< 0.01	6.91% +/- 4.3%

# Looking Forward

- Communicate results
  - College Leadership – overall results
  - Program Directors and Staff – details by program
  - College-wide – What Works style publication
- Write it all up
- Lather, rinse, repeat

# Let's See What We Can Do!

