CIVITAS LEARNING & JISC

Helping Every Student Achieve

February 22, 2018

How Many Data Points Are In The Models for the UK Innovation Partners?

5 Innovation Partners

- University of Edinburgh
- University of West London
- University of East London
- Northumbria University
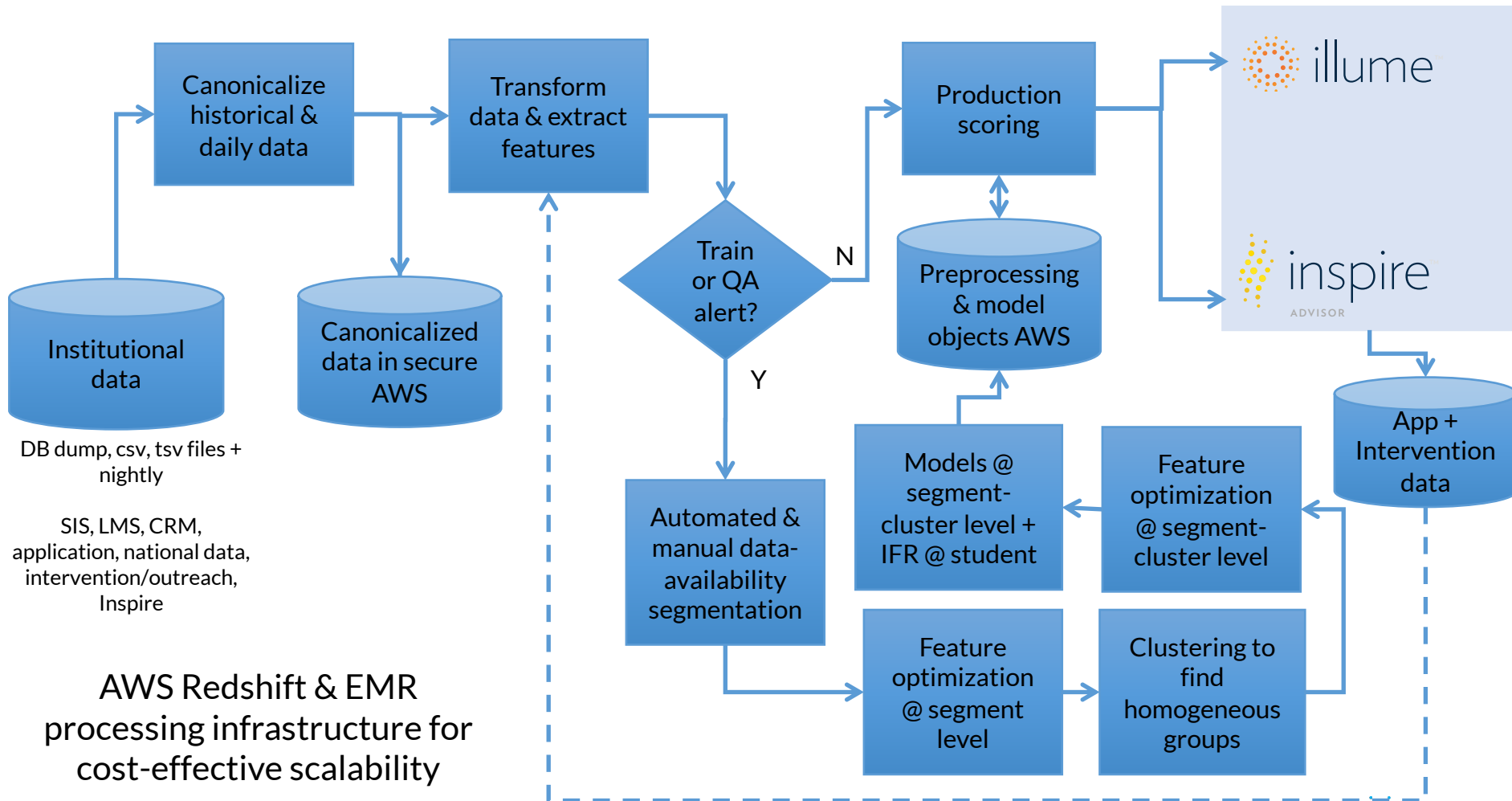- Bucks New University

76,930 Active Students
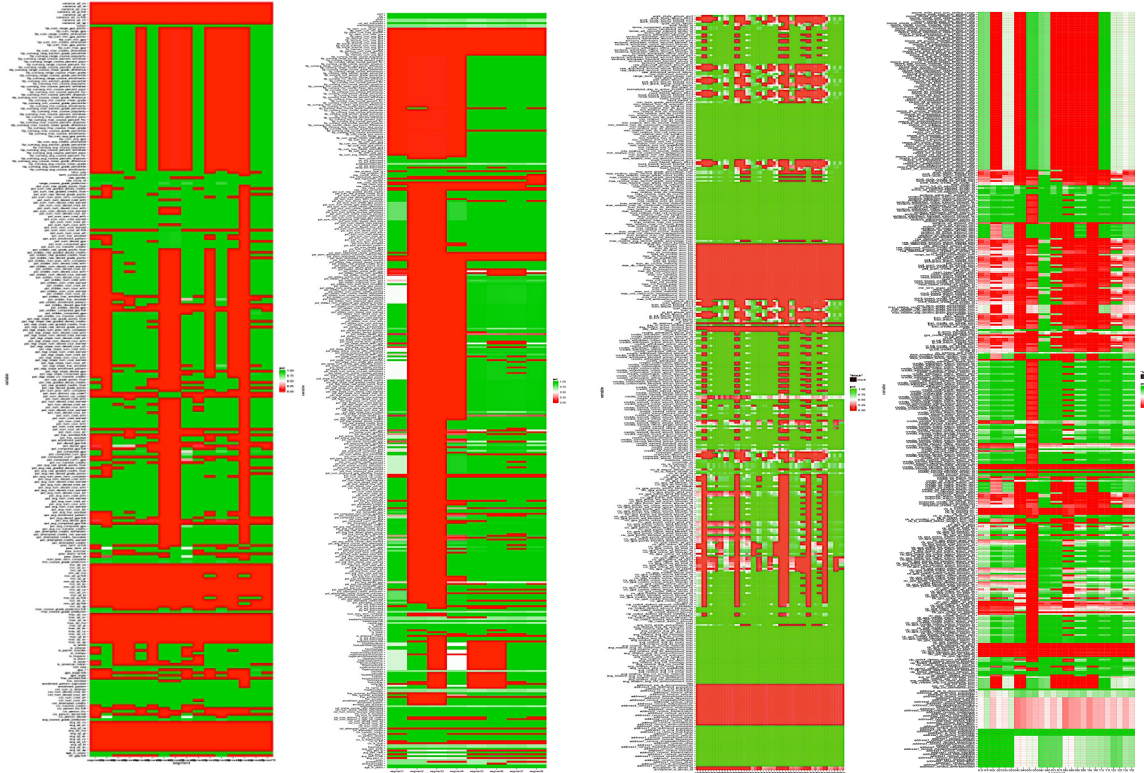
168,476,700,000 total data points are available to the model

PUTTING IT ALL TOGETHER

Raw data → Derived Features → Models & personalized insights

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DATA AVAILABILITY SEGMENTATION

Data adaptive model building to account for student diversity and variability in data footprint

Data availability segmentation
- Maximizes potential of available data - Improves model accuracy and robustness as well as providing greater insights

- Typically 5-20 segments per institution - Efficiently evaluates patterns of data availability to identify segments

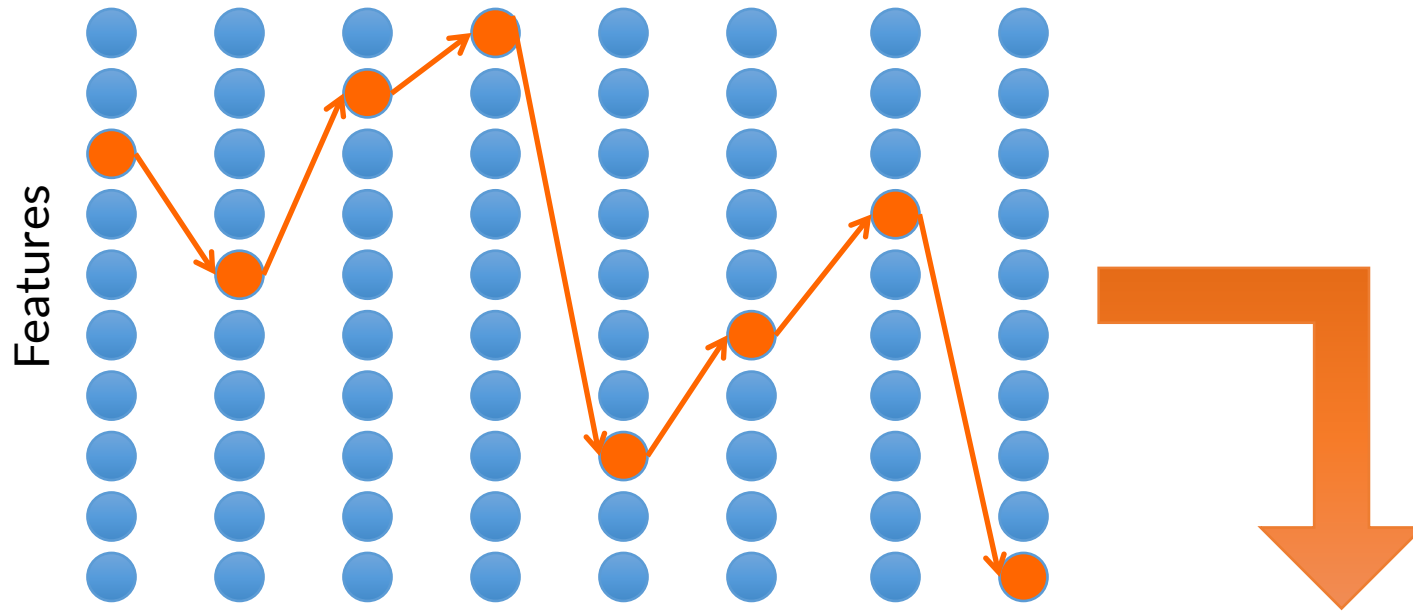- Handles missing data without imputation

Who are these students?
- We can typically look at DA segmentation and see which segments are new students (no grade and no prior terms completed) vs. experienced students (most data available)
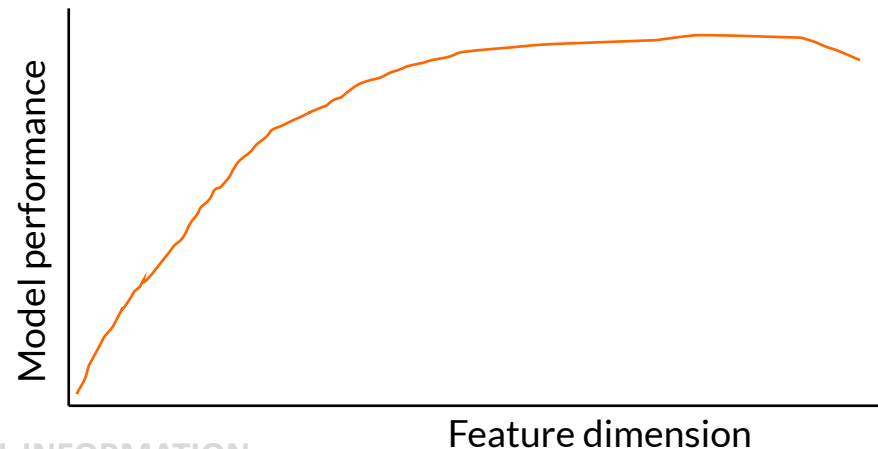
DATA SCIENCE: FEATURE COMPETITION

- Cluster level competition to identify best modeling approach and features
- Training/test datasets for validation
- Rank-order curve to identify the point of diminishing returns → Prevents over-fitting
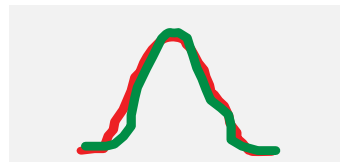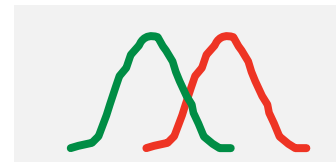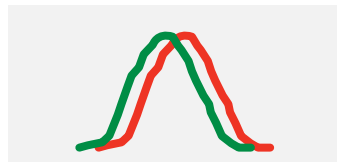
Predictive power is measured by the multi-modal overlap measure (MOM). MOM is the measure of the shared area in a feature graph between those who persisted and did not persist. Same idea when transitioning from categorical features to looking at continuous features. As in a t-test, powerful predictors have the most separation.
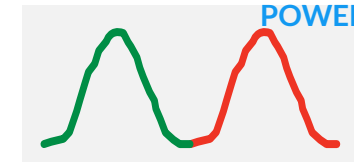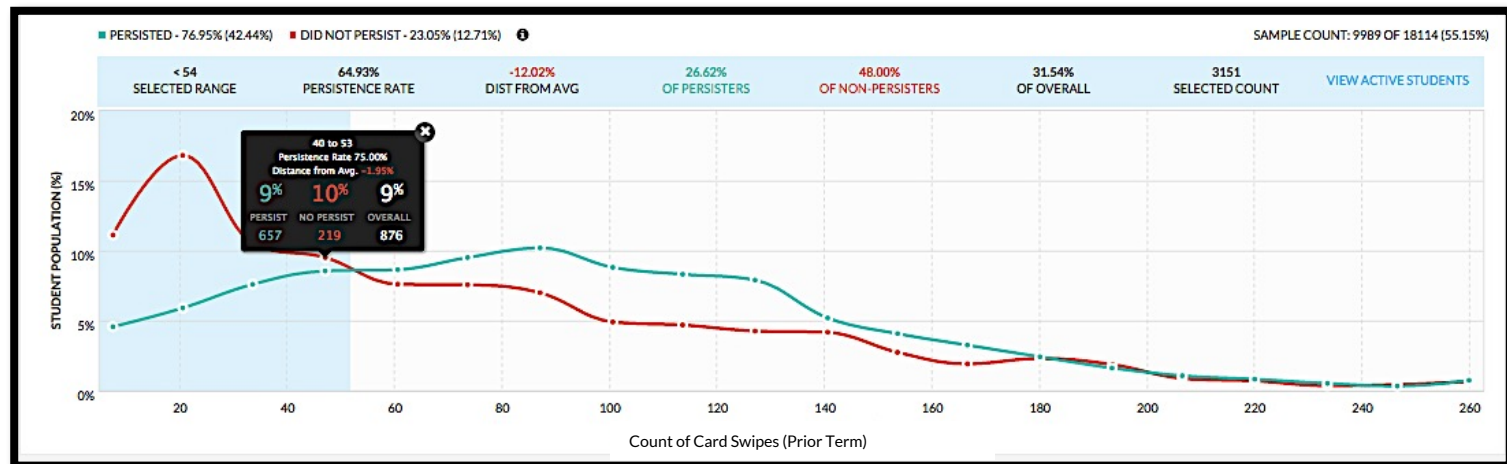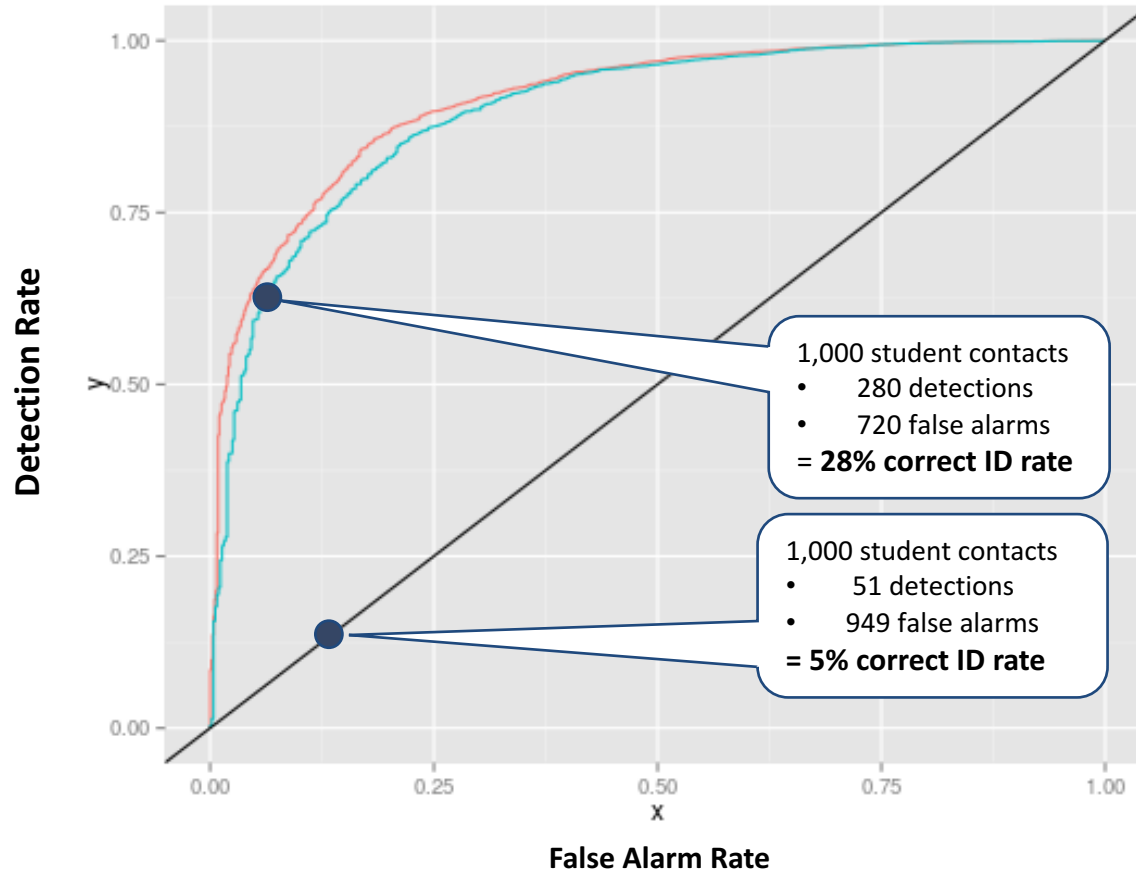
**HIGH MOM
LOWER PREDICTIVE POWER**

**LOW MOM
HIGHER PREDICTIVE
POWER**

SIMILAR

DIFFERENT

SAMPLE COUNT: 9989 OF 18114 (55.15%)

- PERSISTED - 76.95% (42.44%) ■ DID NOT PERSIST - 23.05% (12.71%)

| < 54 SELECTED RANGE | 64.93% PERSISTENCE RATE | -12.02% DIST FROM AVG | 26.62% OF PERSISTERS | 48.00% OF NON-PERSISTERS | 31.54% OF OVERALL | 3151 SELECTED COUNT | VIEW ACTIVE STUDENTS |

40 to 53
Persistence Rate 75.00%
Distance from Avg. -1.95%

9%	10%	9%
PERSIST	NO PERSIST	OVERALL
657	219	876

Count of Card Swipes (Prior Term)

STUDENT POPULATION (%)

A MEASURE OF PERFORMANCE: ROC CURVE

The horizontal axis measures the amount of incorrect predictions--how many students the model predicts are at risk of failure, but in fact succeed. This is the "false alarm rate."

Vertical axis measures the amount of correct predictions--how many students the model predicts are at risk of failure, and do fail. This is the "detection rate."

Detection Rate (vertical axis)

False Alarm Rate (horizontal axis)

1,000 student contacts
- 280 detections
- 720 false alarms
= **28% correct ID rate**

1,000 student contacts
- 51 detections
- 949 false alarms
= **5% correct ID rate**

Test Population:
- 10,334 students
- 9,812 continued
- 522 did not continue

Civitas Model (Test)

Civitas Model (Train)

**Random Selection**

INSIGHTS FROM THE UK INNOVATION COHORT
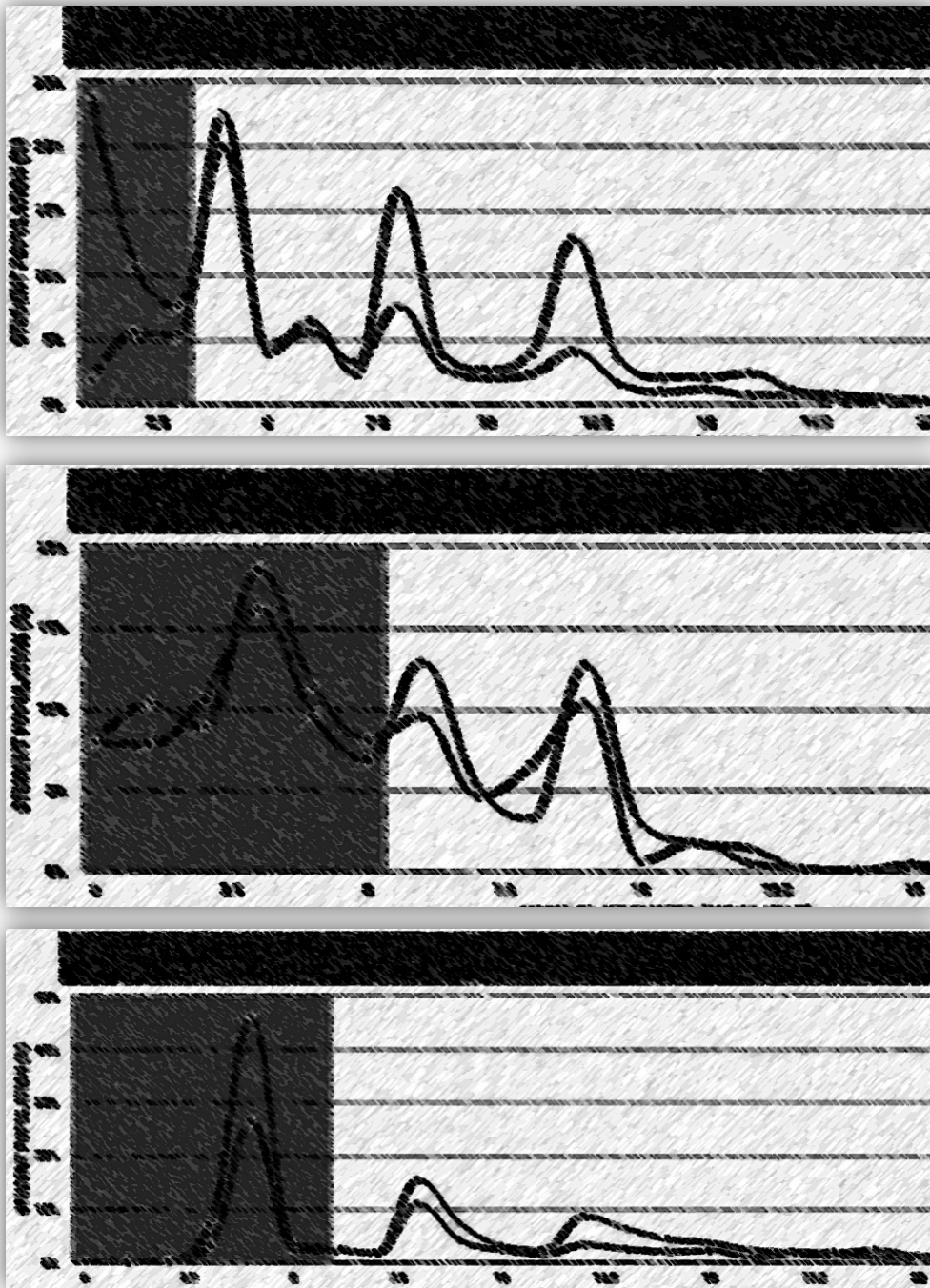
Different Universities Create Different Choice Architectures

- "Modules Attempted" is a good variable for understanding student choice relative to student performance.

- Looking at modules attempted (versus modules earned) can help us understand student burn-out and resiliency at different universities.

- All these universities have students who are leaving early in their program (first year) but the dynamics of those stop-outs is different.

MODULES ATTEMPTED CONTINUED
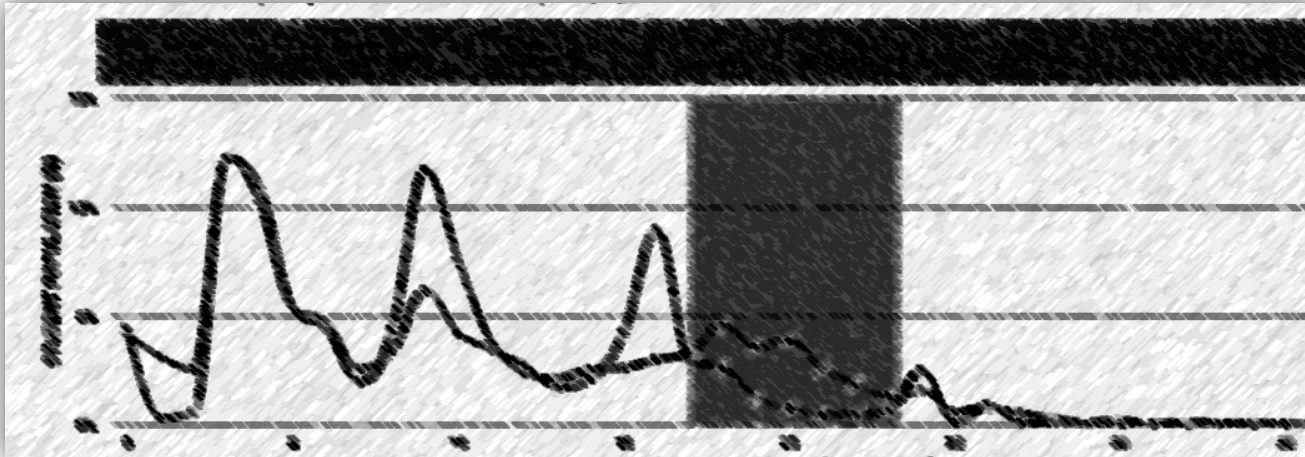
Institutions don't always lose students at the start of their journey.

What is the context at this university and what structures can they enable to help these students?

Some institutions lose students at a consistent rate for a longer time through their programmes.

How would this university provide consistent support? Or should they look at a different variable?
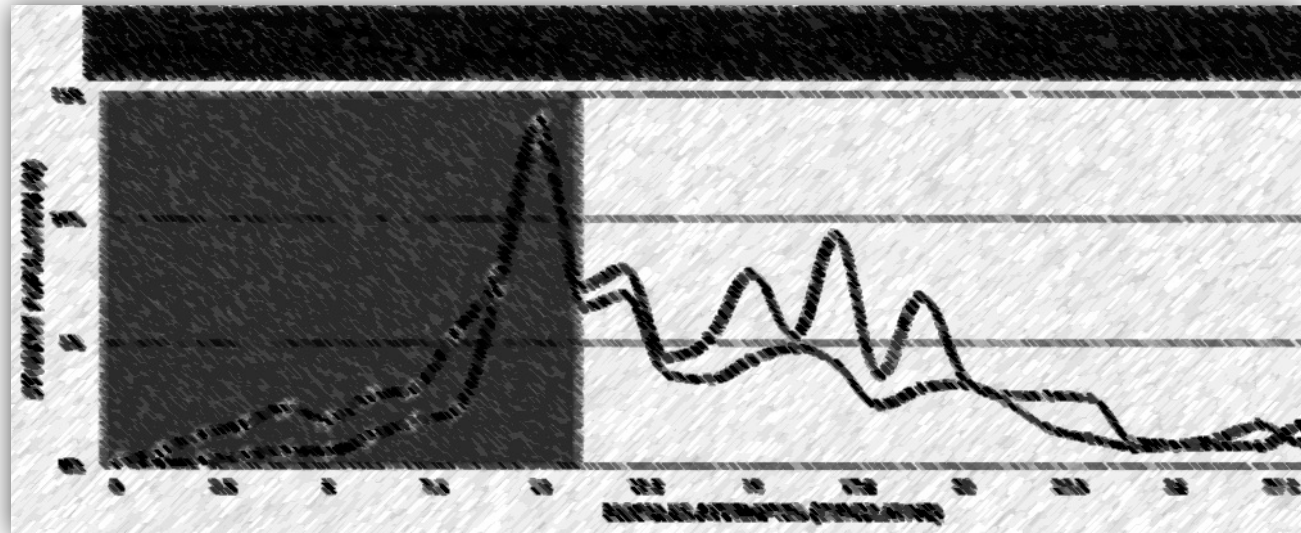
BELONGING

NORMALIZING

GOAL SETTING

How might we use mindset principles to help students persist and thrive?

EMPATHY

MATTERING

GROWTH MINDSET

"Nudges are **small pushes in the right direction** that do not require prescribed actions, but **encourage certain behaviors.** When students are presented with a nudge sent **from a trusted person** at your institution, they have the freedom to **make their own choices** with information **about behaviors** we know are more strongly **associated with positive persistence** and **graduation outcomes.**"

- Kuh, George D., et al. *Student success in college: Creating conditions that matter.* John Wiley & Sons, 2011.

CHANGING THE INSTITUTIONAL TONE

"A fundamental principle of our student success initiative is this: we believe all students can and will succeed if given the opportunity to do so.

Our students have demonstrated that. We are here to help students. We are here to help them earn a degree. Instead of data making students nameless, I actually know more students and know their stories."

-- Dr. Paul Dosal, Vice Provost for Student Affairs & Student Success

JISC & CIVITAS INSPIRE PILOT

CREATING AN INSTITUTION SPECIFIC PLATFORM

WORK WITH US!

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