PARSS

PREDICTIVE ANALYTICS AND RESEARCH FOR STUDENT SUCCESS

Modified January 2023

UNIVERSITY of
SOUTH FLORIDA

What is PARSS?

- PARSS is a group of researchers at the University of South Florida that supports Student Success professionals by developing analytical models that identify students with potential need for additional support.

Why is PARSS at USF?

- PARSS is here to provide student success professionals with additional tools to help identify students who may benefit from support.

- PARSS was developed to aid in achieving Florida State Performance Based Funding (PBF) metrics.

- Towards that end, PARSS attributes directly align with PBF metrics.

- The Performance Based Funding Model was approved at the January 2014 Board of Governors Meeting. The development of the model included university presidents, provosts, boards of trustees, and other stakeholders starting in the fall of 2012. The model includes 10 metrics that evaluate Florida institutions on a range of issues. These metrics were chosen after reviewing over 40 metrics identified in the University Work Plans.

How does PARSS work?

- PARSS gathers large amounts of student data and uses machine learning and statistical modeling techniques to identify students with potential need for additional interventions.
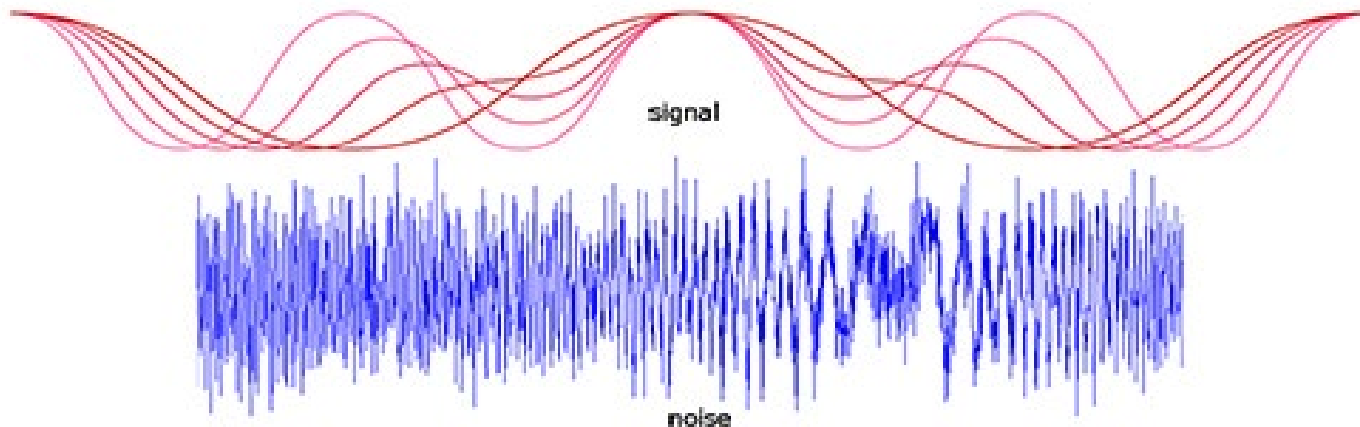
Machine Learning

- Machine Learning sifts through large amounts of data to find patterns and predict outcomes.

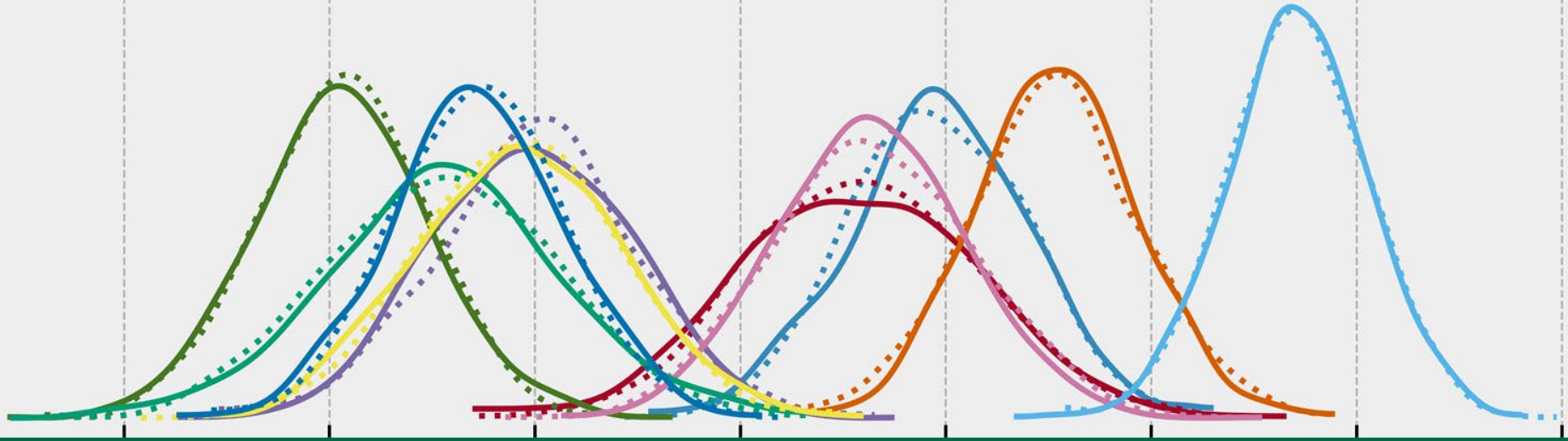Input Data → Analyze Data → Find Patterns → Predictions → Stores the Feedback

Statistical Modeling

Statistical Modeling uses known distribution properties to quantify data. A statistical model is a mathematical model that embodies a set of statistical assumptions concerning the generation of sample data and similar data from a larger population.

PARSS: Data

PARSS collects academic and demographic data from platforms like Banner as well as student behavior and attitudes from assessments.

Demographic	Academic	Behaviors	Attitudes towards
Major	GPA	Campus Engagement	Perseverance
College	Earned Credit Hours	Collaboration	Diversity
Campus	#DWF	Faculty Engagement	Difficulty
Education History	Degree Progress	Engagement with Diversity	Challenge
Age	Honors		Preparedness
	GPA Stability		

PARSS Students & Attributes

STUDENTS

PARSS has developed attributes for two undergraduate student populations:

1. First Time in College (FTIC)
2. Transfer students

CONCERNS

PARSS focuses on the following:

1. First year retention
2. Graduating on time
3. Maintaining a stable GPA

FTIC Students

There are four FTIC attributes:

1. First Year Retention (FYR)
2. First Semester GPA Differential (DIF)
3. Finish in Four (SF4)
4. Finish in Six (SF6)

First Year Retention (FYR)

ATTRIBUTE

- The FYR attribute will indicate that a student has a low probability of returning for their sophomore year.

- The FYR model is run at the start of the first year and leverages pre-matriculation data such as high school GPA and data from New Bulls Intake Survey (NBIS).

PBF METRIC

- **Metric 5** - Academic Progress Rate (second year retention with GPA above 2.0)

First Semester GPA Differential (GPA DIF)

ATTRIBUTE

- GPA DIF indicates that a student's first semester in college GPA is significantly lower than their cumulative high school GPA.

- GPA DIF is run at the end of a student's first Fall semester.

- GPA DIF *excludes* any students that achieve below a 2.0 GPA in their first semester as they would already be identified.

PBF METRIC

- **Metric 5** - Academic Progress Rate (second year retention with GPA above 2.0)

Finish in Four (SF4)

ATTRIBUTE

- SF4 will indicate that the student is not on pace to graduate in their fourth Fall semester or fifth Summer based on their progress at the start of the second and third Spring semester.

- To ensure timely student graduation in alignment with the Finish-in-Four metric, this attribute gives Care Team members early insights into which students are on the fringe of that achievement. Additional support could aid the student in graduating earlier than otherwise.

PBF METRIC

- **Metric 4** - Four Year Graduation Rates (full-time FTIC)

Finish in Six (SF6)

ATTRIBUTE

- SF6 will indicate that a student has a low probability of graduating by their sixth Summer.

- This attribute is run in a student's fourth Summer.

PBF METRIC

- **Metric 9b** - Six-Year Graduation Rate for students who are awarded a Pell Grant in their first year

Transfer Attributes

There are four transfer student attributes:

- Transfer First Year Persistence (TRP)
- First Semester GPA Differential (GPA DIF)
- Finish in Two (FIT2)
- Finish in Three (FIT3)

Transfer First Year Persistence (TRP)

- The TRP model predicts whether or not a student will persist into their second fall semester.

- This TRP attribute indicates that a transfer student with an AA degree from a Florida community college will need some support or a "lift" in order to persist to the end of the next fall semester. In effect, it is the FYR attribute for transfer students.
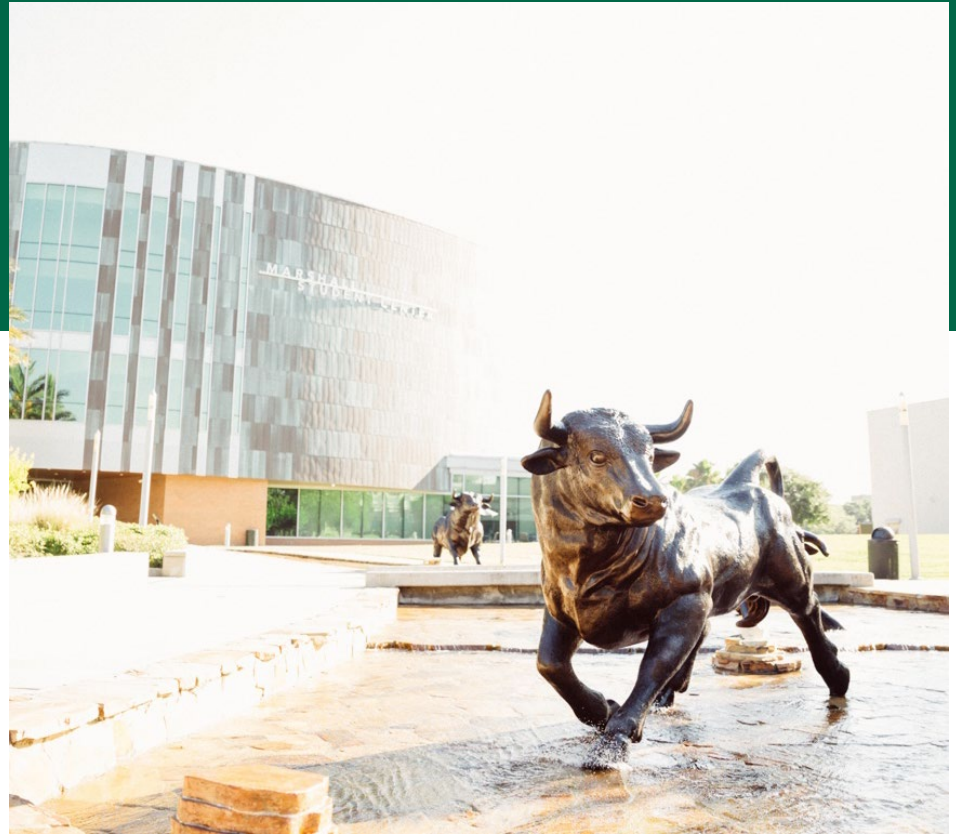
Transfer First Semester GPA Differential (GPA DIF)

- GPA DIF indicates that a student's first semester at USF GPA is significantly lower than their cumulative Transfer GPA.

- GPA DIF is run at the end of a transfer student's first Fall semester.

- GPA DIF *excludes* any students that achieve below a 2.0 GPA in their first semester as they would already be identified.

Finish in Two (FIT2)

ATTRIBUTE

- The FIT2 model predicts the likeliness of a transfer student will graduate by their second Summer.

- The FIT2 attribute indicates that a student may not graduate within two years.

PBF METRIC

- **Metric 9a**: Two-Year Graduation Rate for FCS Associate in Arts Transfer Student

Finish in 3 (FIT3)

- The FIT3 model predicts the likelihood of a transfer student graduating by their third summer.

- The FIT3 attribute indicates that a transfer student may not graduate within three years.

Models Summary

FTIC

- FYR - This attribute indicates that the student has a low probability of returning in their second year.

- GPA DIF - This attribute indicates that the student's GPA is far lower than expected.

- SF4 - This attribute indicates that the student has a low probability of graduating within four years.

- SF6 - This attribute indicates that the student has a low probability of graduating within six years.

TRANSFER

- TRP - This attribute indicates that the student has a low probability of returning in their second year.

- GPA DIF - This attribute indicates that the student's GPA is far lower than expected.

- FIT2 - This attribute indicates that the student has a low probability of graduating within two years.

- FIT3 - This attribute indicates that a student has a low probability of graduating within 3 years.

Value Added

- PARSS supports Student Success professionals through the creation of student attributes which are intended to help identify why a student may need additional support.

- We process large amounts of raw data and aggregate it into principled data which is far more interpretable.

- Achieving or not achieving PBF Metrics may get down to helping 150 more students to graduate on time. PARSS tries to bolster the probability of achieving PBF Metrics.
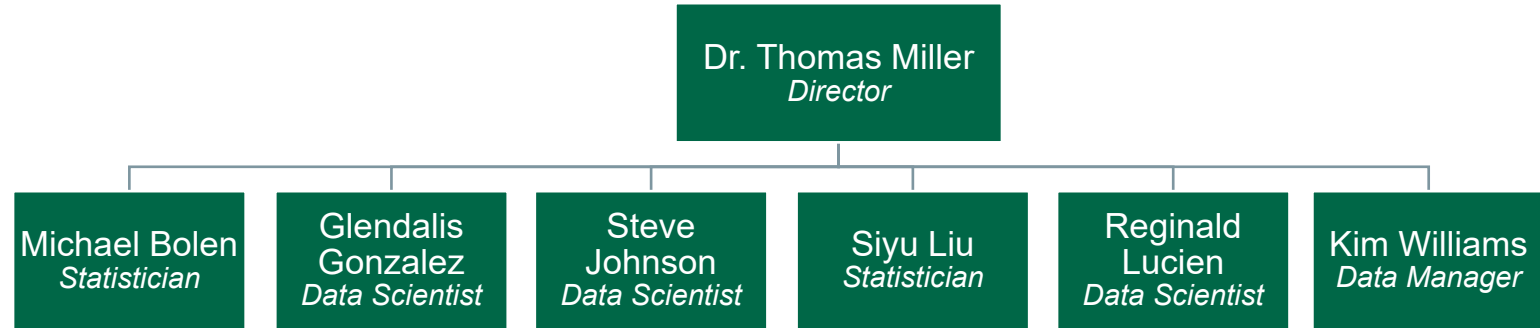
Signal vs. Noise

More noise

Less noise

Obscurity

Distraction

Mystery

Clarity

Less Signal

More Signal
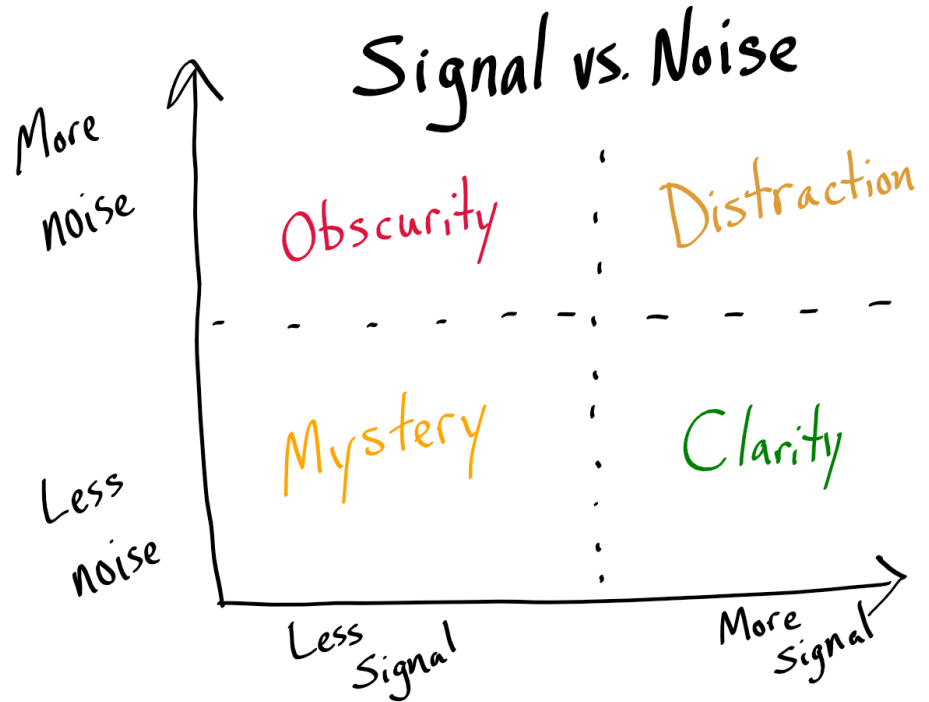
PARSS: Partners

- PARSS works with Undergraduate Studies (UGS) to develop and disseminate student data.

- PARSS works with the Office of Decision Support (ODS) on model development, data sharing, and data compliance.

- The Care Team is the group of Student Success professionals who use the predictive analytics to give specific service to students identified as benefitting from extra support.

PARSS

ODS

Care Team

UGS
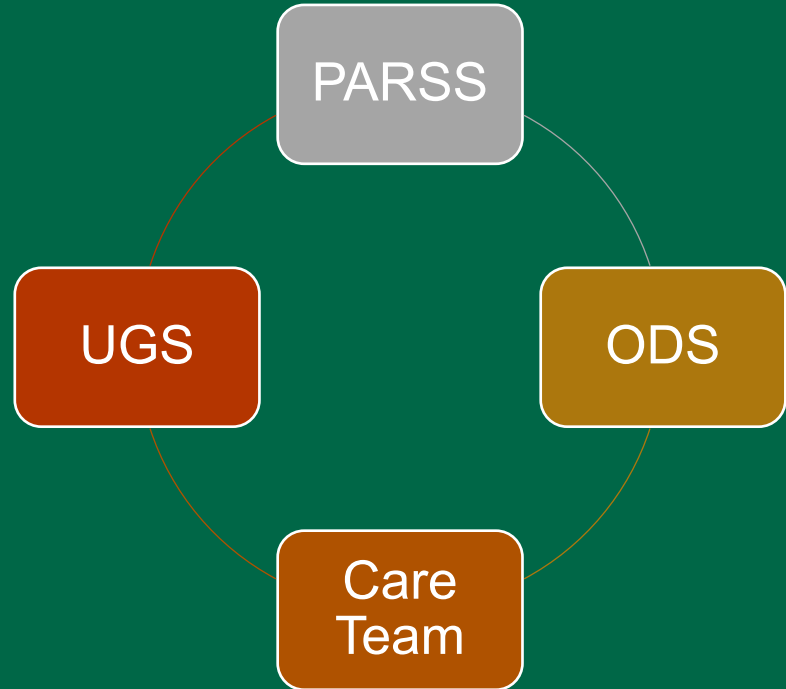
Who is on the PARSS team?

- Data scientists are big data wranglers, gathering and analyzing large sets of structured and unstructured data. They analyze, process, and model data then interpret the results to create student attributes.

- Statisticians practice the science of using data to make decisions. They decide what data they need and how to collect it, design experiments, collect data, analyze and interpret data, and report conclusions.

| Dr. Thomas Miller |
| *Director* |

| Michael Bolen | Glendalis Gonzalez | Steve Johnson | Siyu Liu | Reginald Lucien | Kim Williams |
| *Statistician* | *Data Scientist* | *Data Scientist* | *Statistician* | *Data Scientist* | *Data Manager* |

Quality Assurance

- No machine learning or statistical model is perfect.

- Error is inherent in all estimations. We monitor, evaluate, and improve our models at every iteration.

- We welcome your collaboration moving forward to enhance our methods.

IDENTIFY

PLAN

Continuous Improvement Cycle

REVIEW

EXECUTE
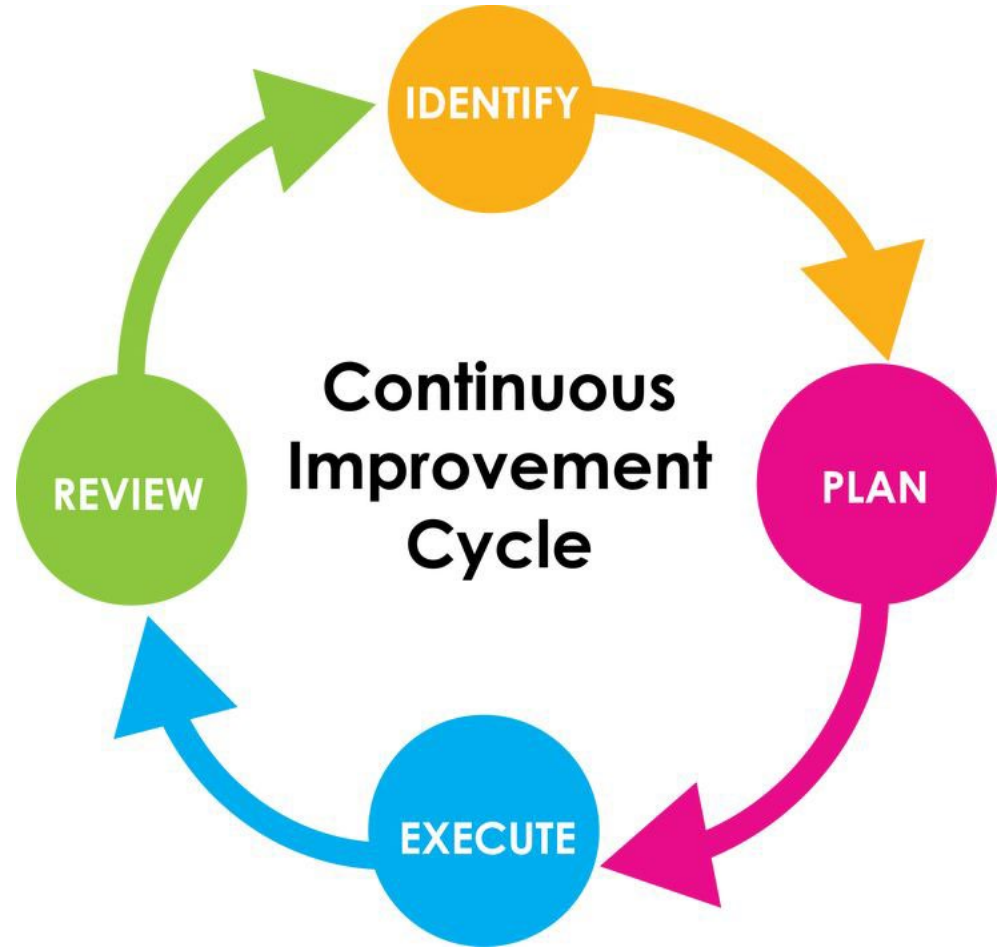
PARSS and Student Success Professionals

- PARSS uses many common variables like GPA and earned credit hours in our models.

- However, USF Care Team members have years of experience working closely with students and have a far more discerning understanding of factors that affect success.

- Working in collaboration with the Care Team and PARSS can determine new variables to include in the models thus improving their accuracy and utility.

Advising SMART

- PARSS student success attributes are part of the Advising SMART dashboard.

- You may need to request access.
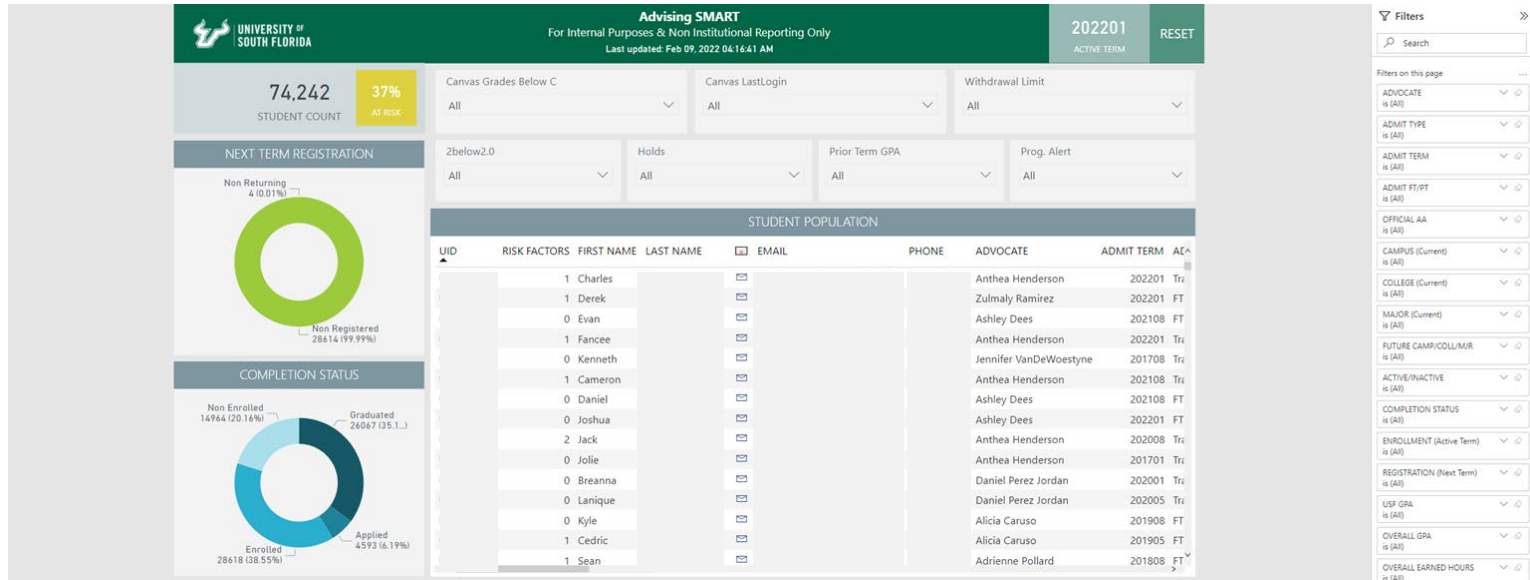
OAA SMART

- The Office of Academic Advocacy SMART dashboard incorporates the student success attributes.

- You may need to request access.

Transfer Student Success Dashboard

- PARSS student success attributes are also located in the Transfer Student Success Dashboard.

- You may need to request access.
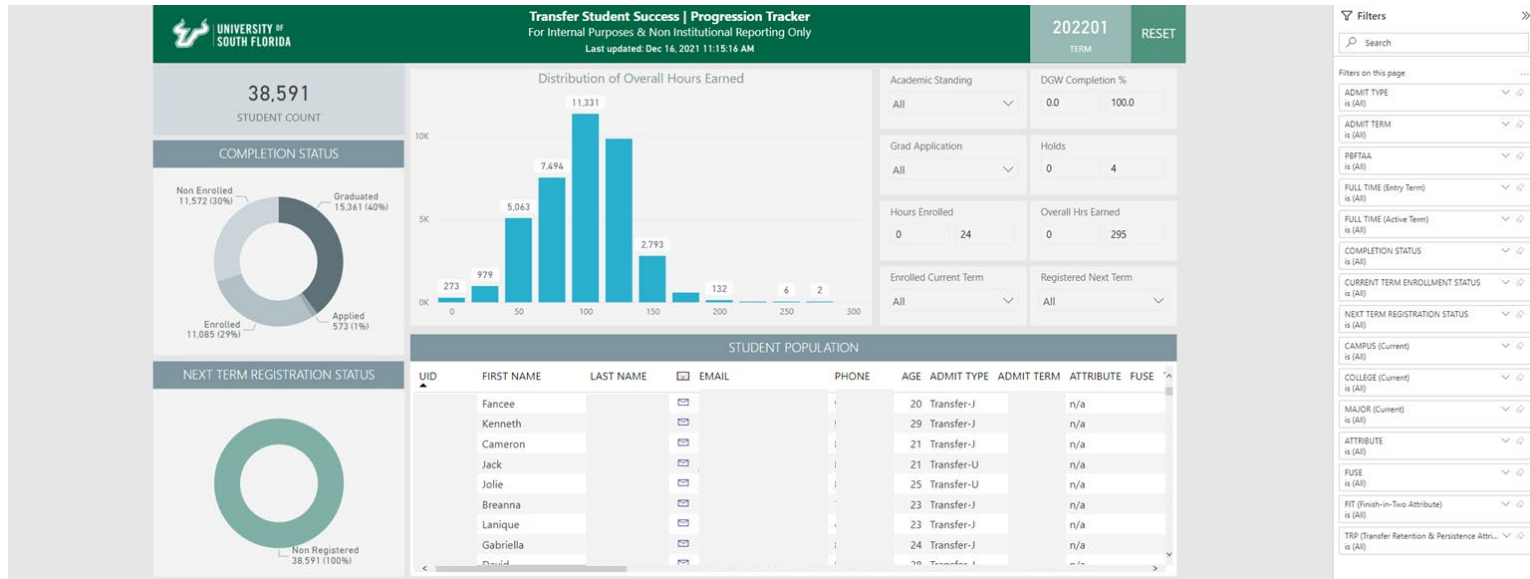
Thank you!

- PARSS appreciates your support and collaboration.

- Please distribute this widely.

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