More than a Student Information System

Taking the Mystery Out of Early Warning

Campus Analytics Suite

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Product Owner, Infinite Campus

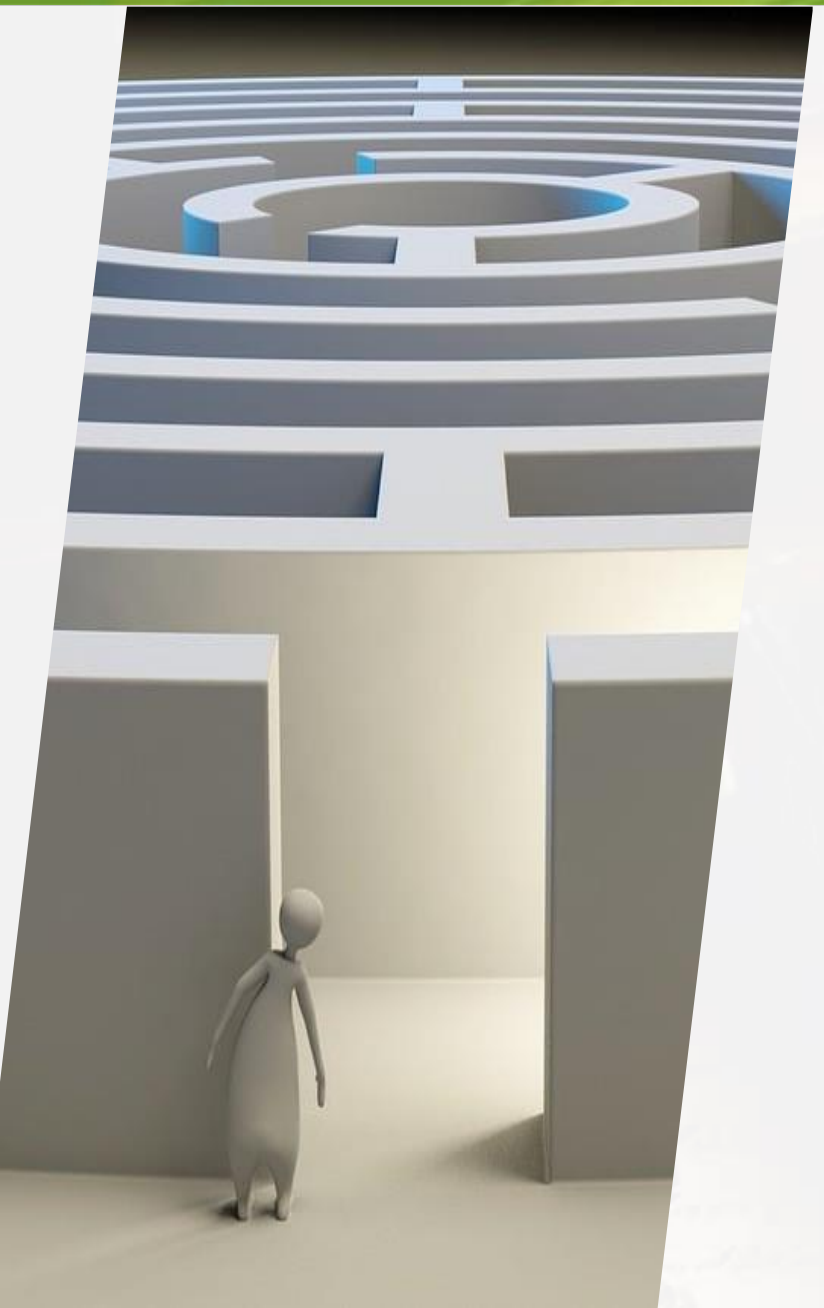
Taking the Mystery Out of Early Warning

- What is Early Warning?
- What is a GRAD Score?
- Is Early Warning AI?
- What is Machine Learning?
- How is a GRAD Score calculated for a student?
- What can I learn from the GRAD score?

What is Early Warning?

Early Warning

The Infinite Campus Early Warning tool is a data dashboard that helps inform stakeholders of each student's likelihood of completing high school and/or progressing to the next grade level.



Why did we build it?

The Early Warning system was built to address a problem with conventional Graduation Monitoring systems

Conventional Systems

Conventional systems utilize a set of thresholds to identify at risk students

- Typical examples of this would be:
  - Students with more than 5 concurrent absences
  - Students with a GPA below 2.0
  - Students with a specific FRL Status

Conventional Systems

The problem is that Threshold Systems lack the context to understand the data, which can result in over and under identifying students

"While it is true that many students who qualify for FRL face additional challenges that may impact their ability to graduate, it is not true that ALL students who qualify for FRL will struggle to graduate"

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Robert Balfanz, PhD

Distinguished Professor at the Johns Hopkins University School of Education, Center for Social Organization of Schools, and Director of the Everyone Graduates Center.

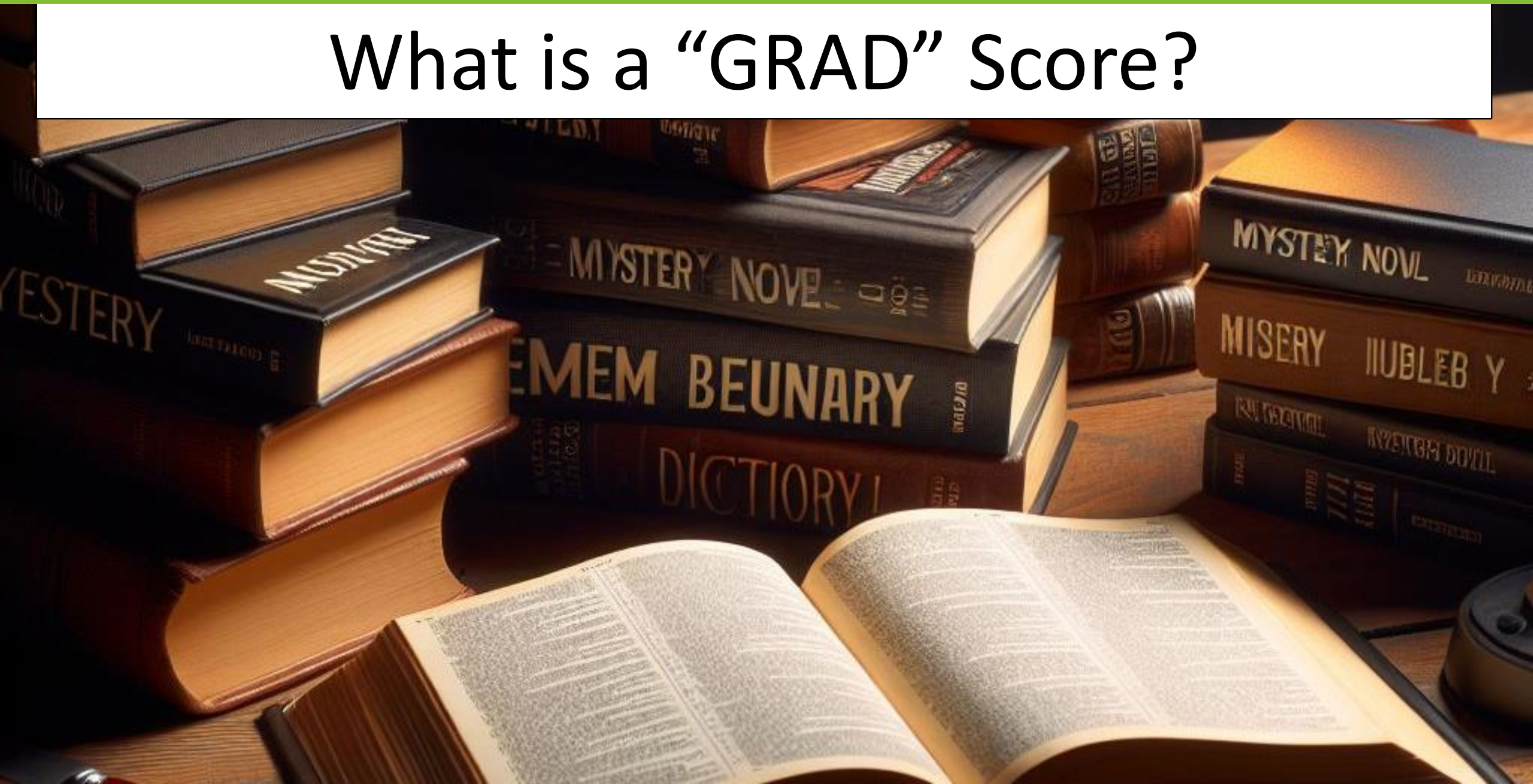
His work focuses on translating research findings into effective school improvement strategies and educational reforms. He conducts research on improving high school graduation and college readiness rates, student success systems, chronic absenteeism, and instructional improvements in schools.

An Innovative Approach

Early Warning was built upon the initial indicators identified in the work of Dr Robert Balfanz and further enhanced through Machine Learning to create a pattern-matching algorithm capable of predicting student risk

The result of this prediction is called a "GRAD Score"

What is a “GRAD” Score?



GRAD Score Defined

Graduation Related Analytic Data

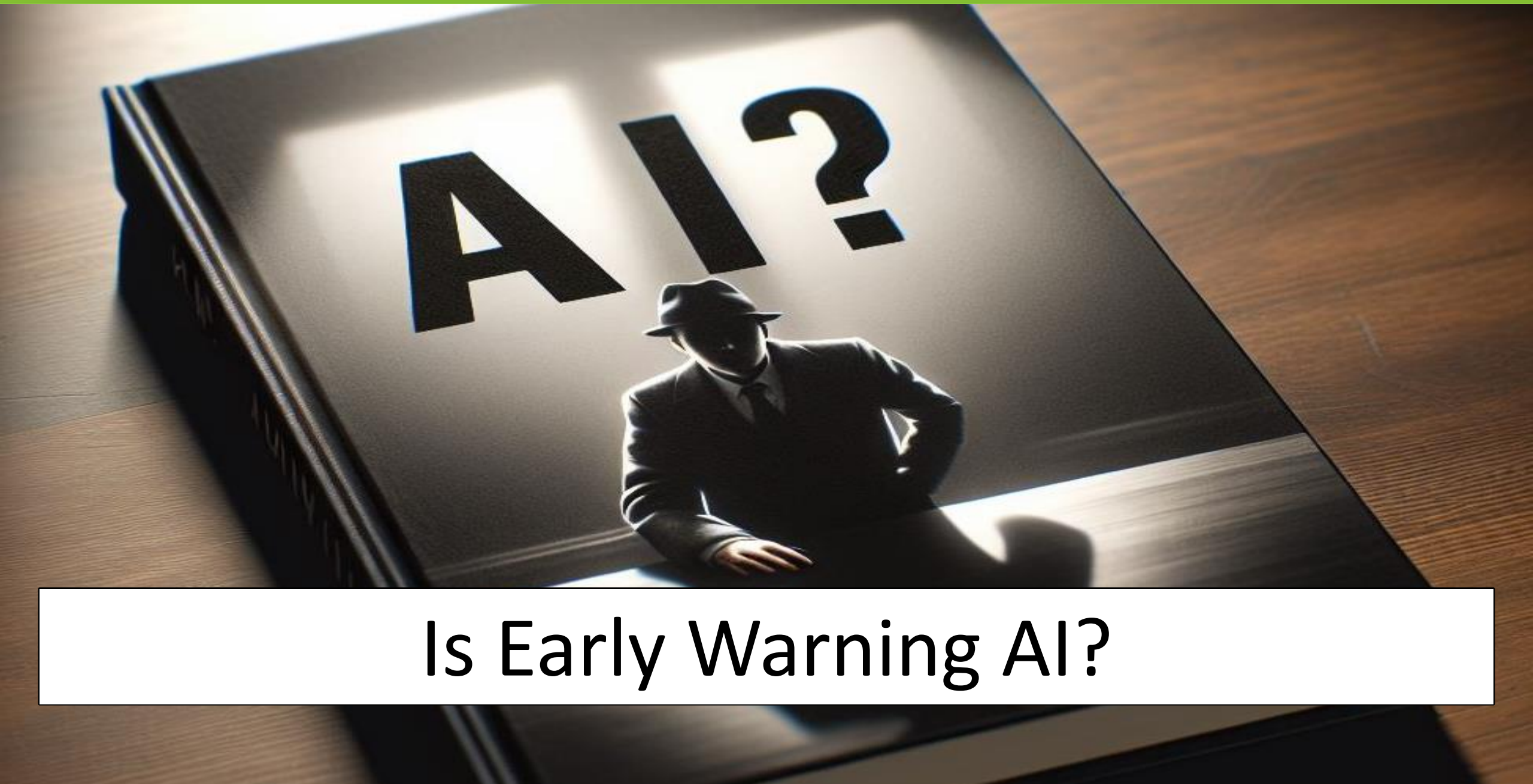
Summarizes a student's educational record with a single number indicating a student's likelihood of graduating or being promoted to next grade level

GRAD Score Defined

Scores range from 50 – 150

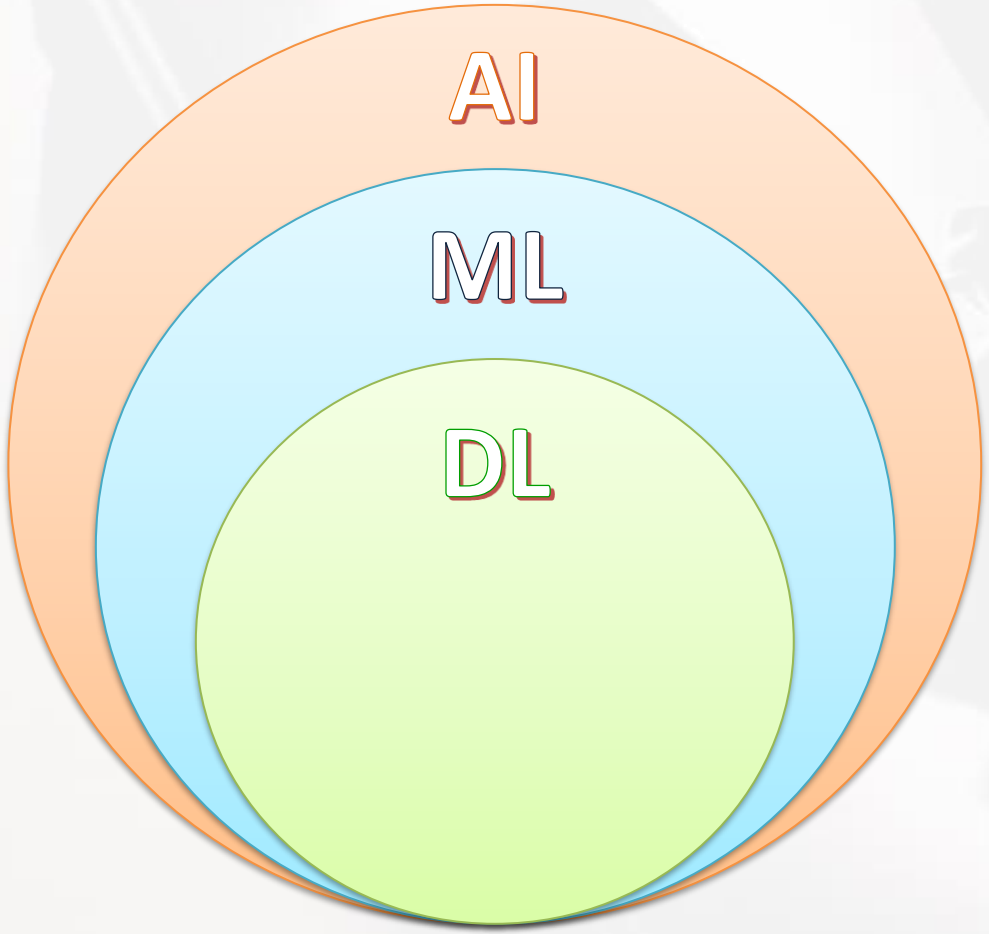
The lower the score, the higher the risk

50.....60.....70.....80.....90....100....110....120....130....140....150



Is Early Warning AI?

Is Early Warning AI? No



Artificial Intelligence

Any software that uses complex methods and algorithms to imitate human intelligence and decision making

Machine Learning

The use of statistical methods to allow a piece of code or model to improve over time with experience

Deep Learning

The use of vast amounts of data, complex algorithms and deep neural nets to train a model

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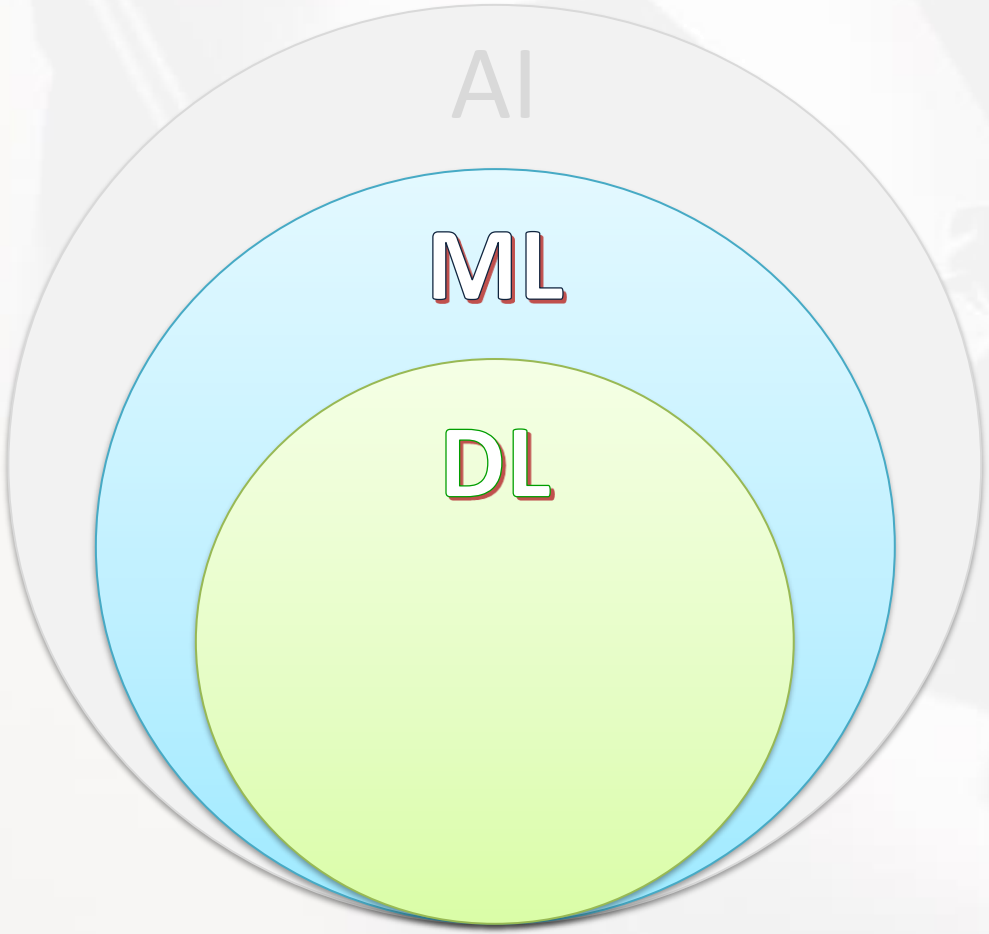
Is Early Warning AI? No



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Is Early Warning AI? No

The Early Warning system utilizes a Machine Learned model to make its predictions. Machine Learning is a building block of AI, but the model is not artificially intelligent

What is Machine Learning?

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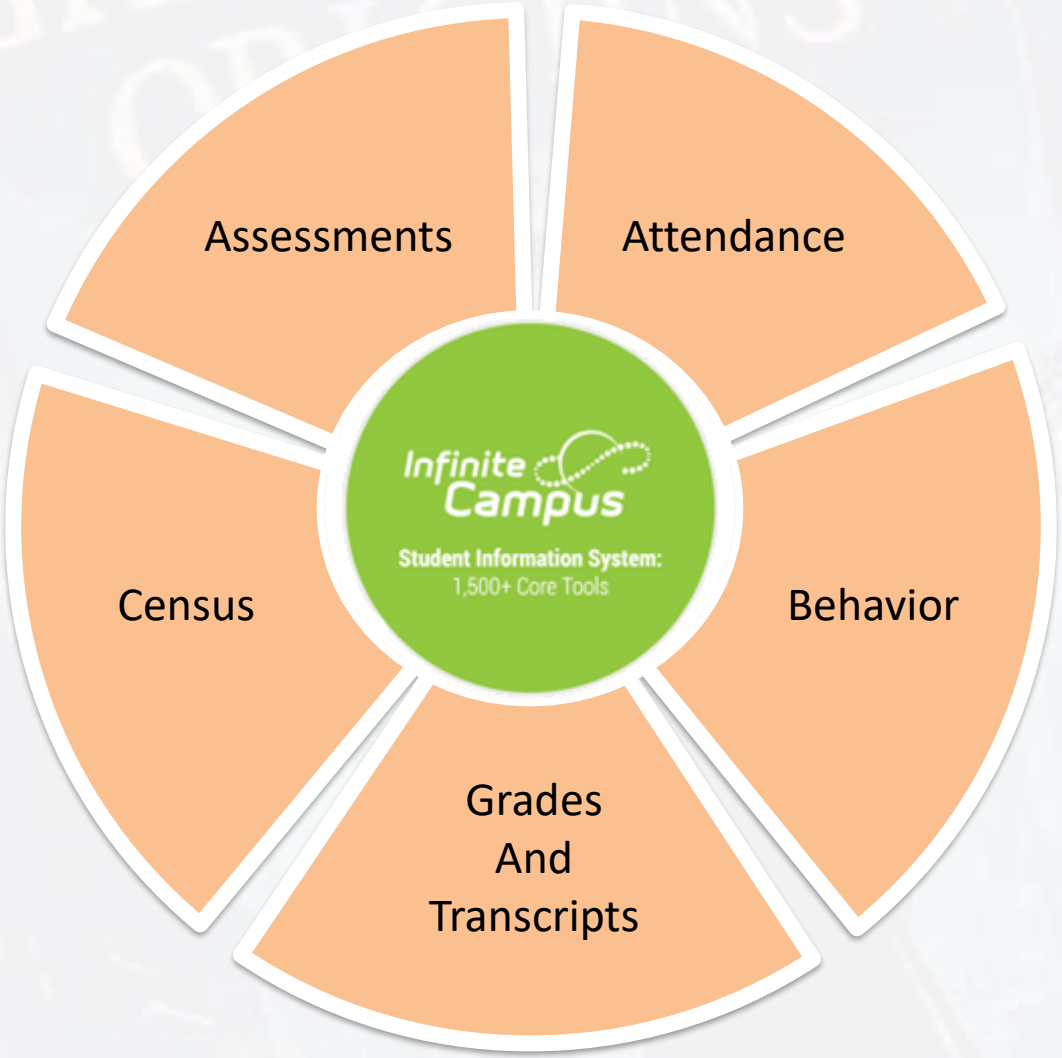
Starts with the SIS



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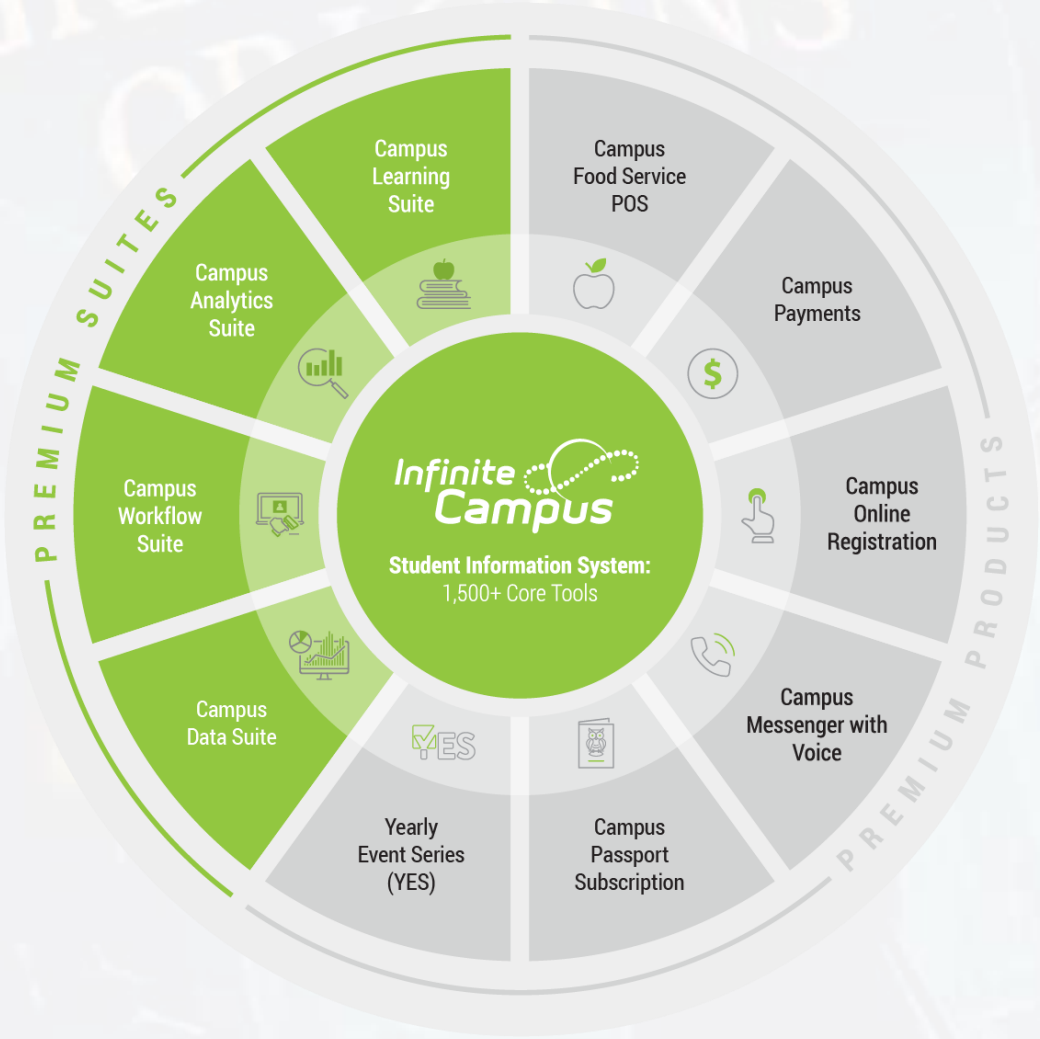
Starts with the SIS



Data Points

Data Combines to Features

One Data Point may be, and likely is, used in Multiple Features

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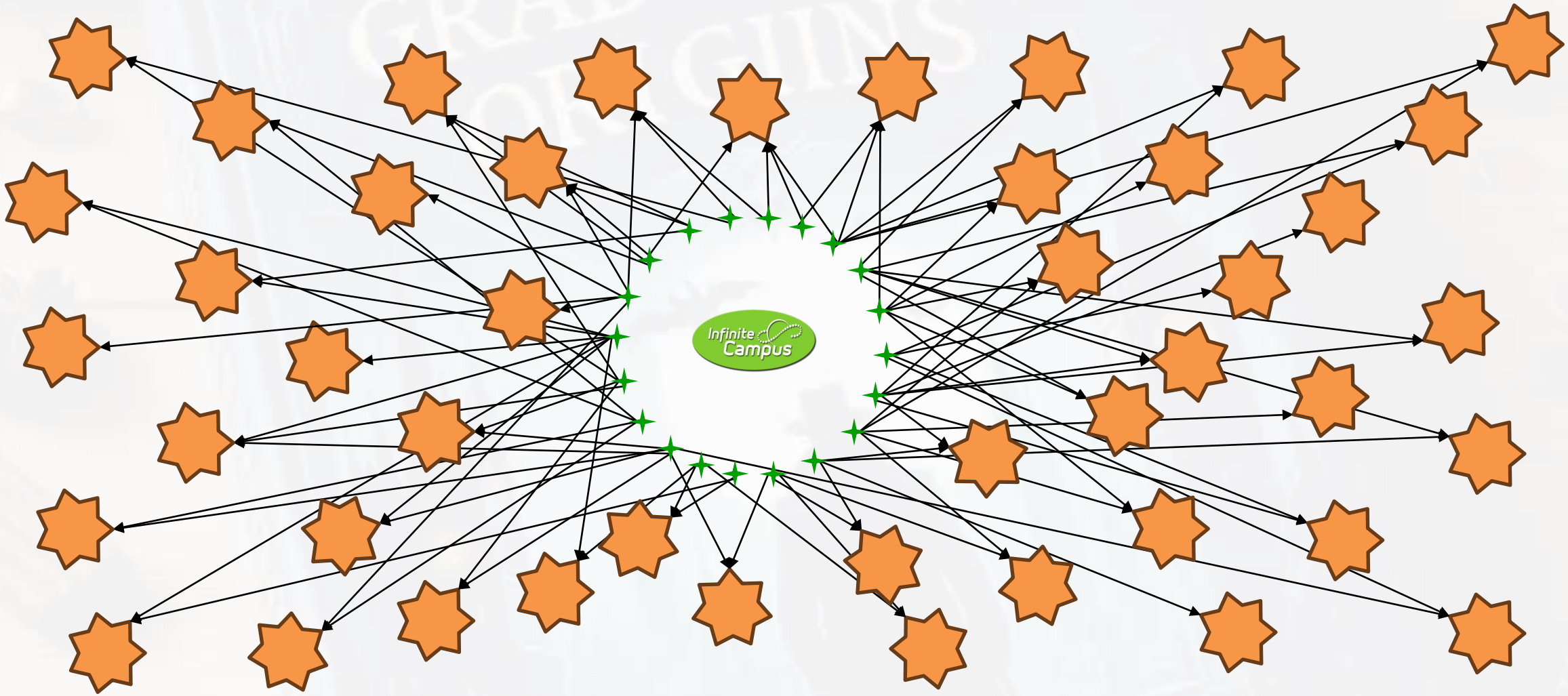
Data Combines to Features



Data Combines to Features

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Features are evaluated for predictive quality

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Examples of features with a high predictive value

- Guardian Portal Logins / Unexcused Absences
- Number of times students changed schools in the same District
- GPA / Sequential Unexcused Absences

Features are evaluated for predictive quality

Examples of features with a low predictive value

- Last Year's Enrollment Start Status
- FRAM Status
- SPED Status

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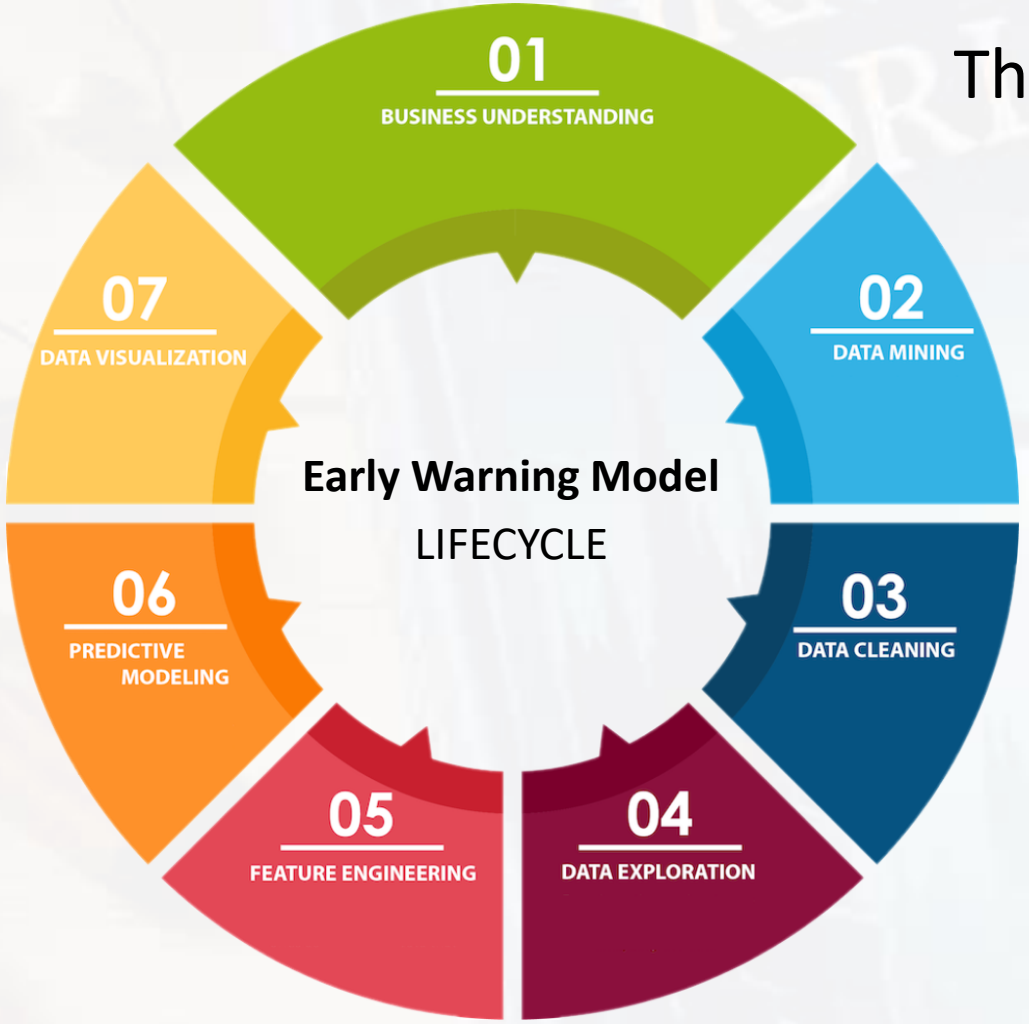
Continuous Improvements

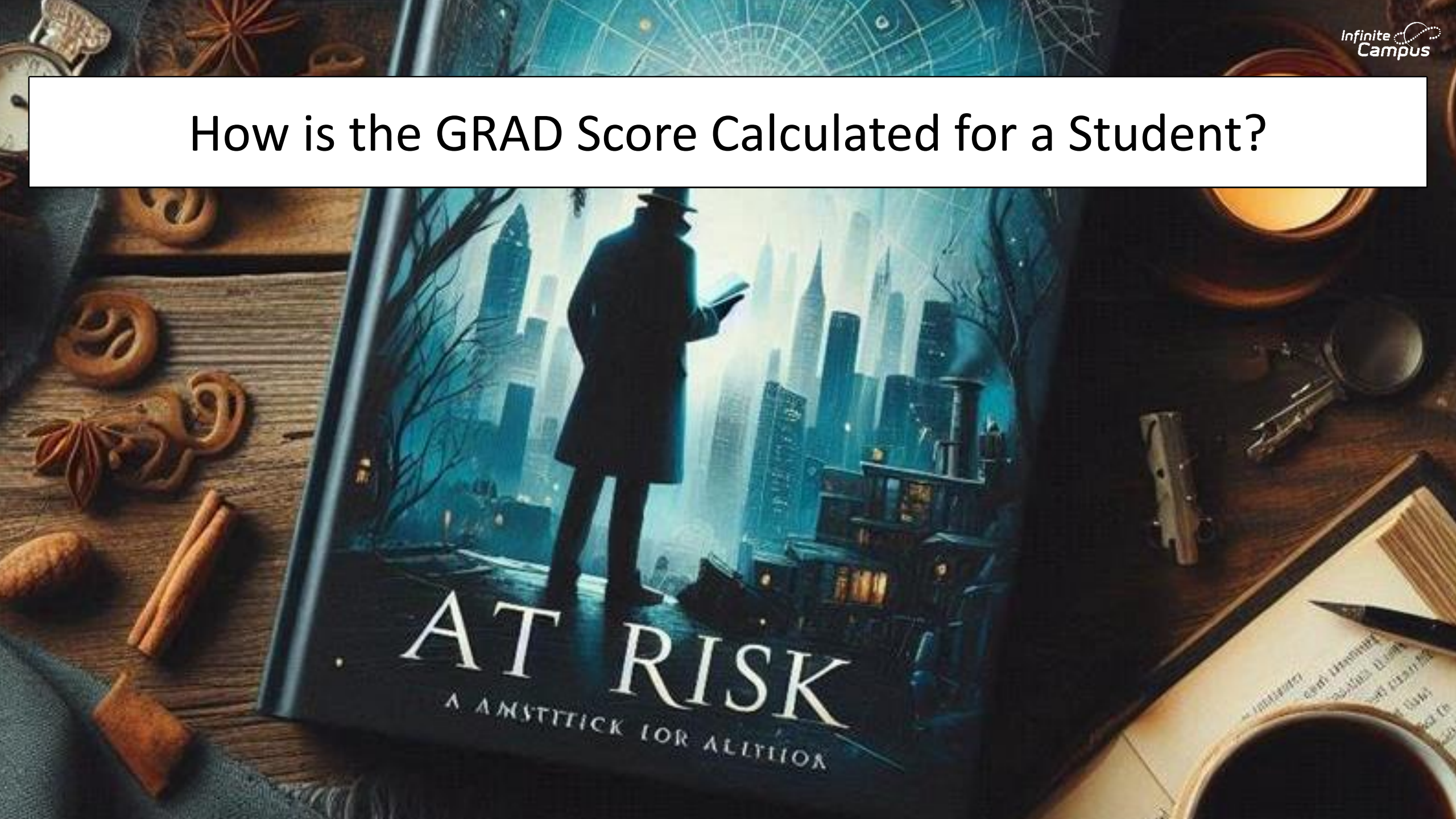


The Early Warning Model is updated Annually

This may include:

- Inclusion of additional years of Student Data
- Changes to specific data points being evaluated
- Addition or removal of Features
- Accommodations for Feature volitivity

How is the GRAD Score Calculated for a Student?



Data Points

Data Points

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Only the features that are linked to data that exists for the student are considered

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Features are evaluated in order based on how predictive they are in something called a "Decision Tree"

Category Scoring

In addition to the Composite Grad Score, individual GRAD scores are calculated for the following categories:

- Attendance
- Behavior
- Curriculum
- Stability

Category Scoring

- Attendance
- Behavior
- Curriculum
- Stability

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Category Scoring

- Attendance
- Behavior
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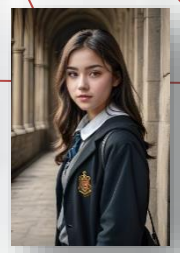

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Category Scoring

- Attendance
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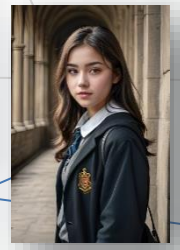
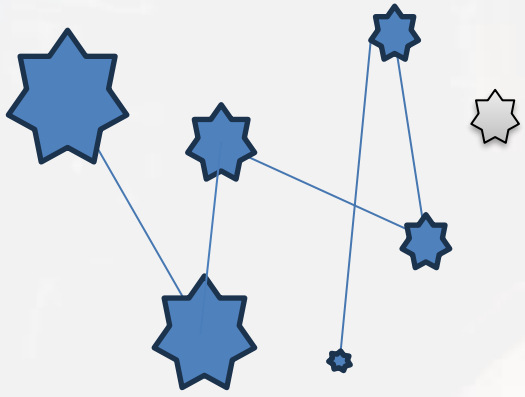


Student-Specific Evaluation

Because students have different data points, as well as different occurrences of these data points (count of behavior, attendance, etc) – and because the features are built from the combinations of multiple data points, the decision tree and feature importance will also be different from student to student.



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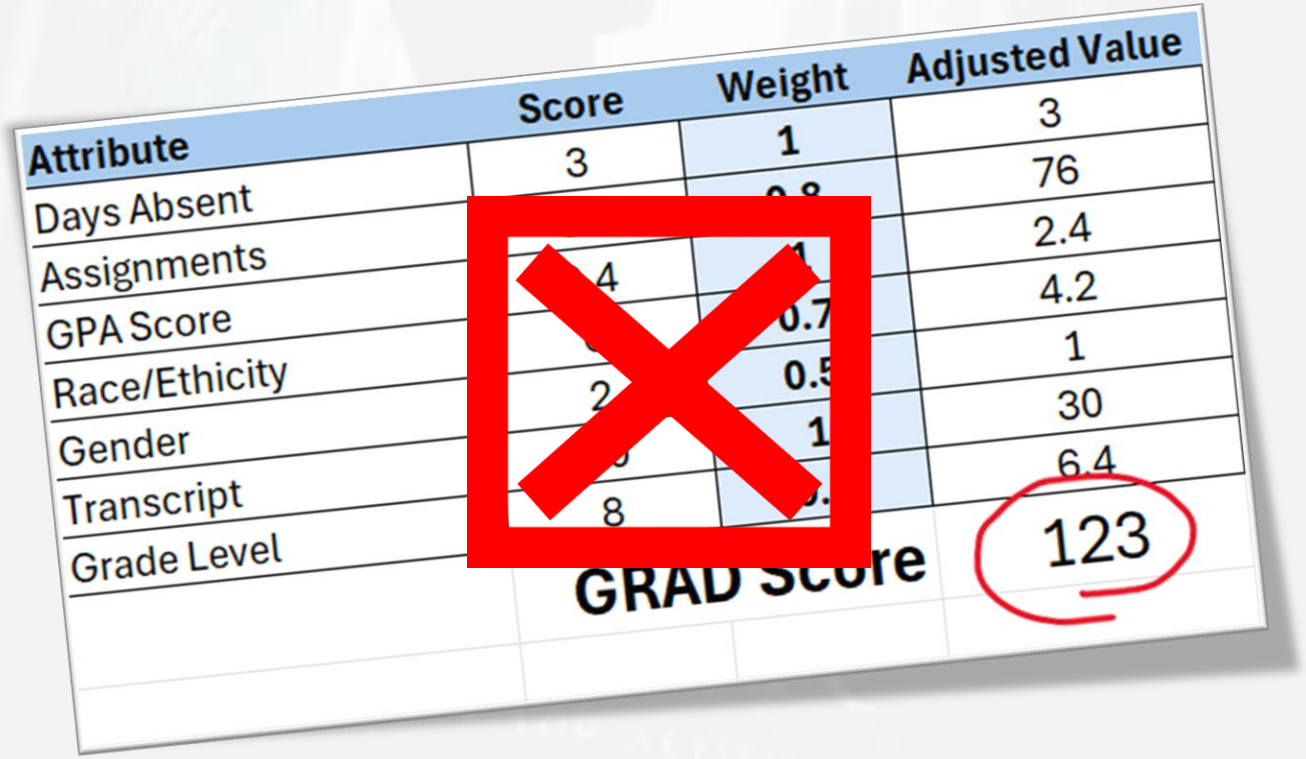
Missing 5 days of school in a row may be identified as an attendance risk factor for a student who also has a low GPA and a pattern of certain behaviors, but NOT a risk factor for a student with a High GPA and a different pattern of behavior

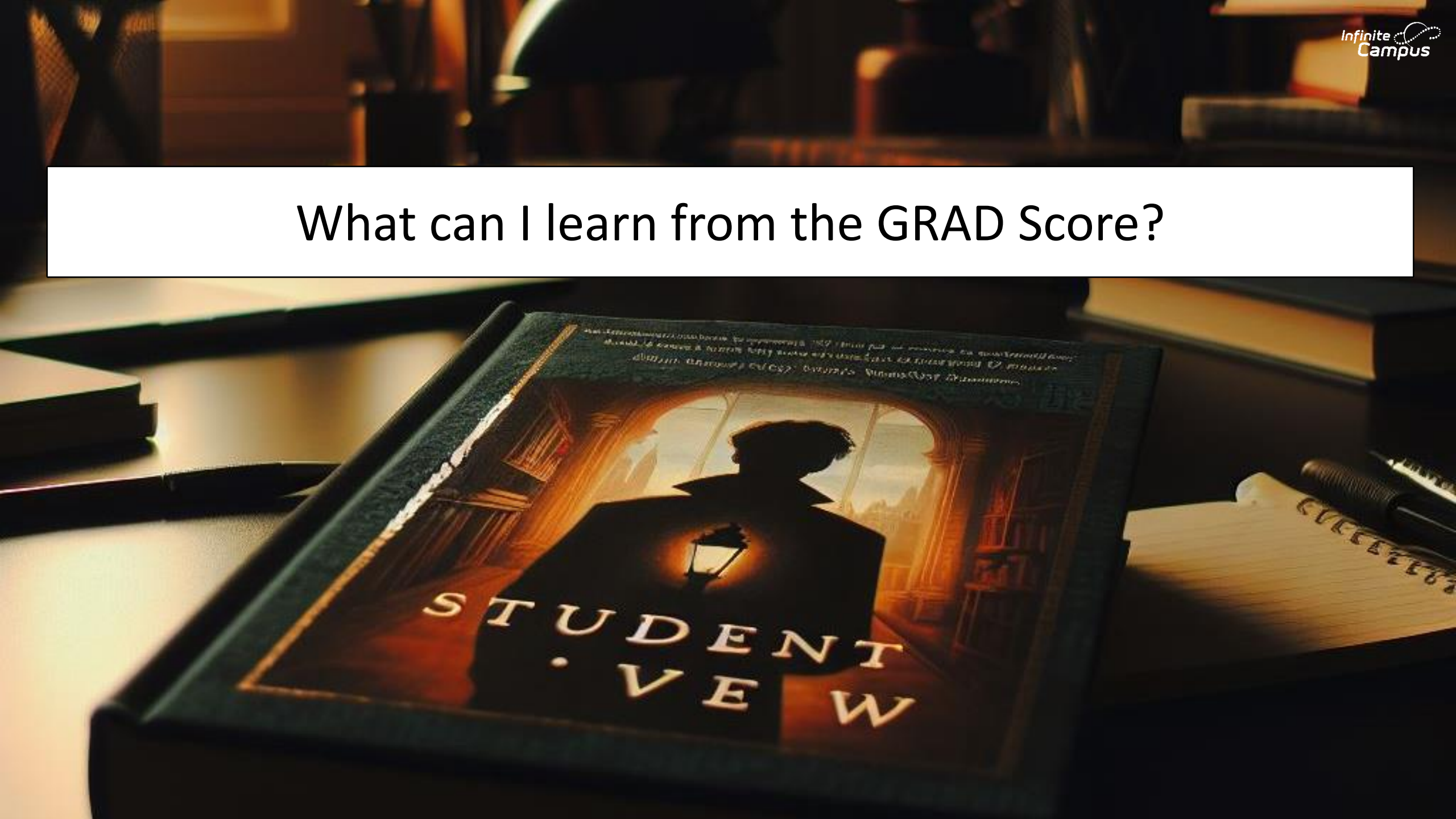
Most Important Thing to Remember

Early Warning GRAD Score IS NOT a Calculator/Spreadsheet



Attribute	Score	Weight	Adjusted Value
Days Absent	3	1	3
Assignments			76
GPA Score	4		2.4
Race/Ethicity		0.7	4.2
Gender	2	0.5	1
Transcript		1	30
Grade Level	8		6.4
		GRAD Score	123

What can I learn from the GRAD Score?



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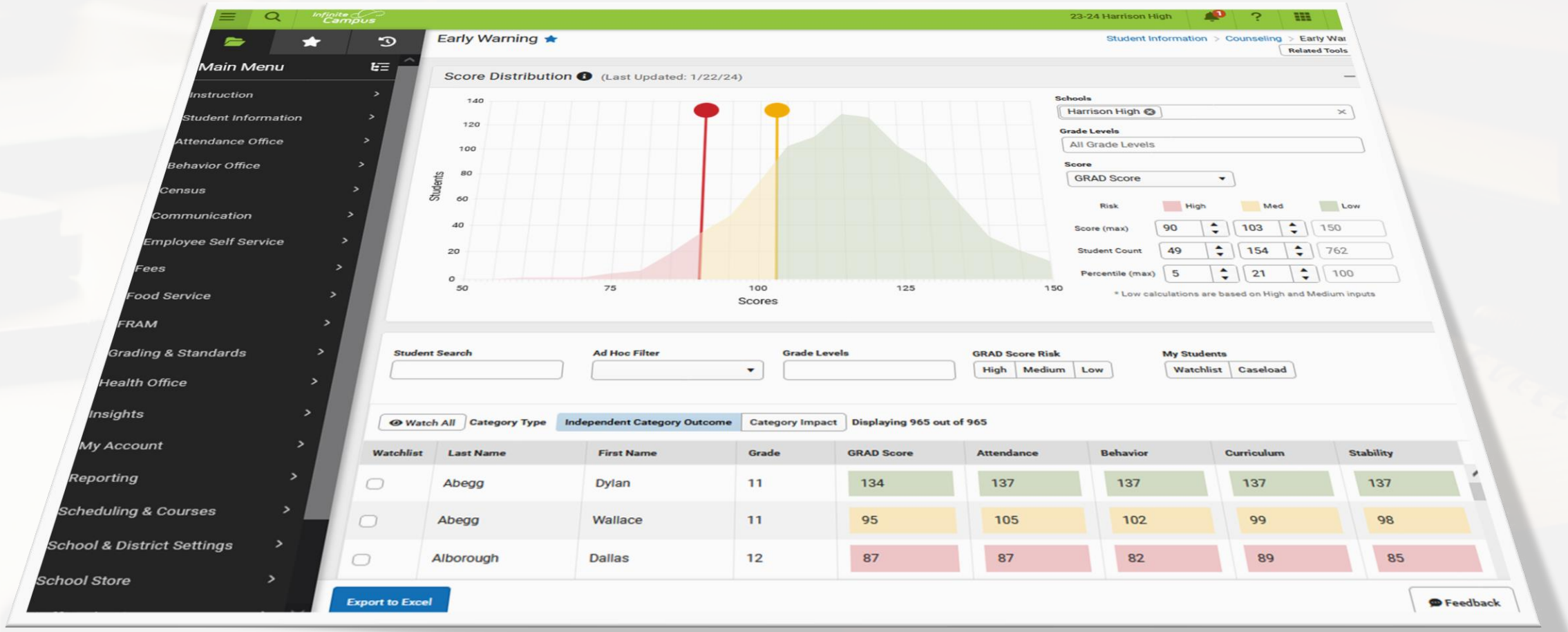
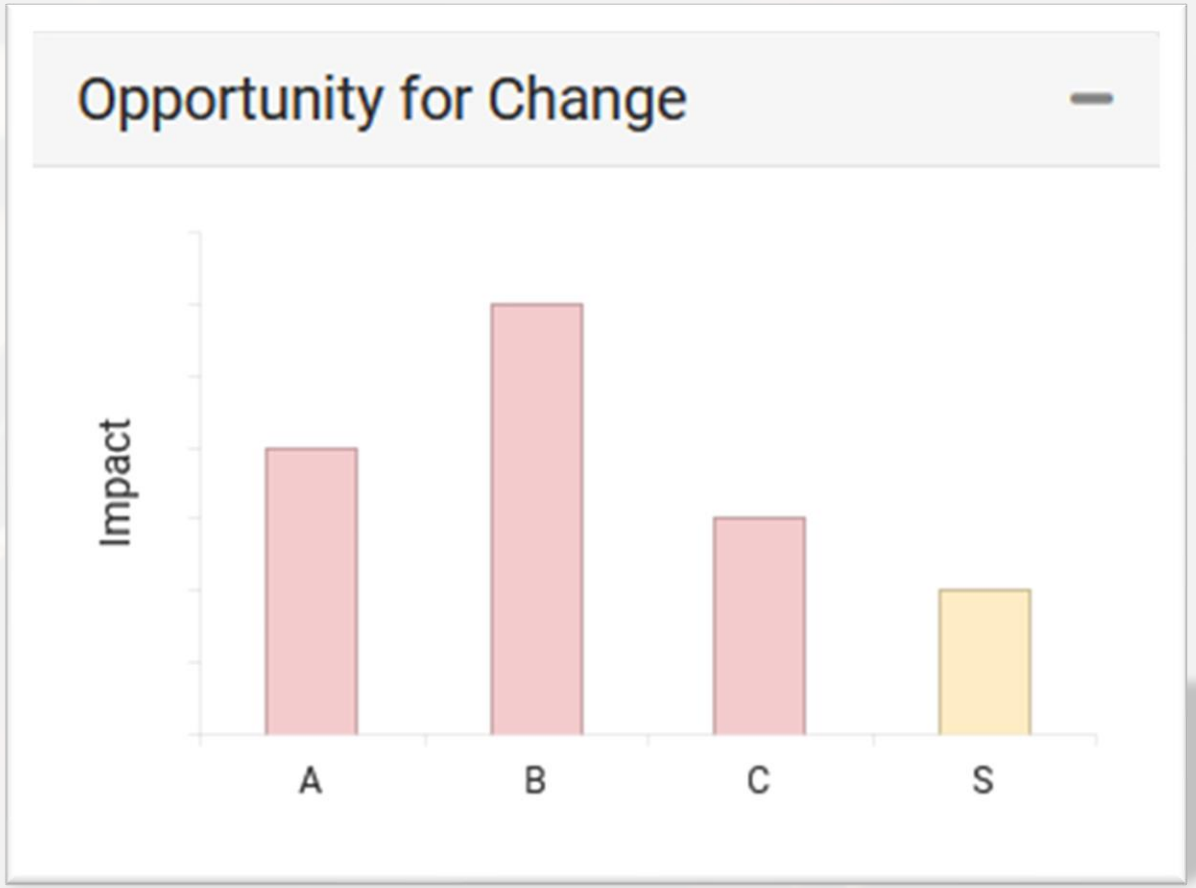
Near-Realtime Student Risk Data



Areas for Impact



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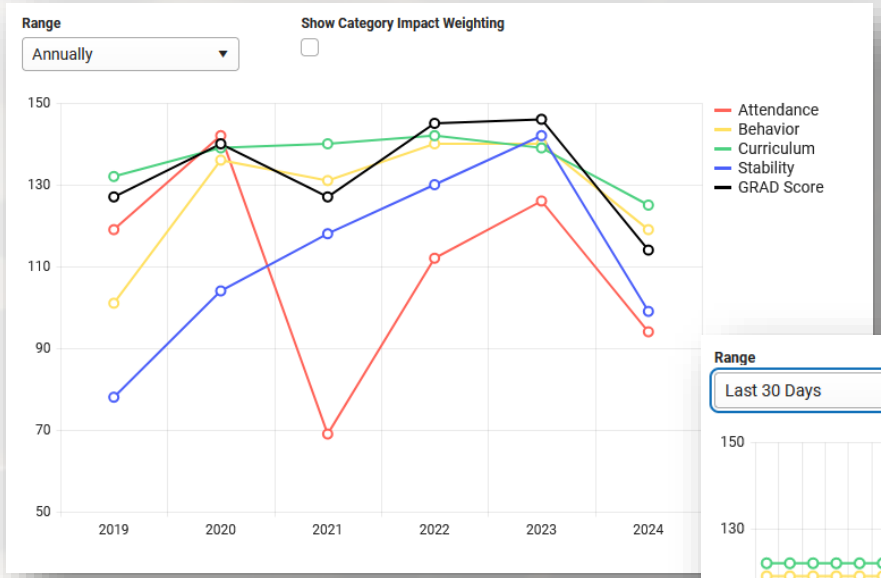
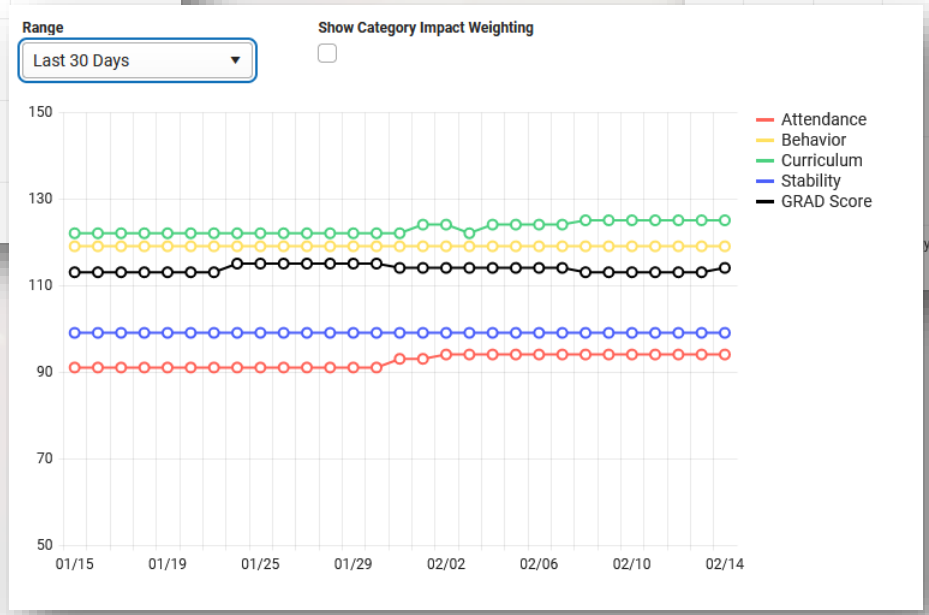
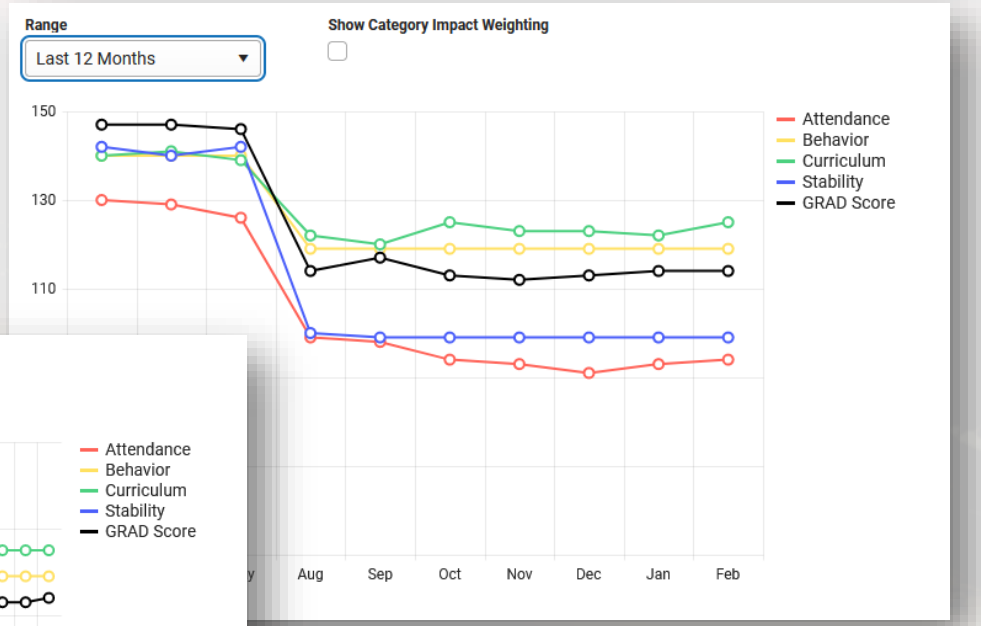
Student Risk Changes Over Time







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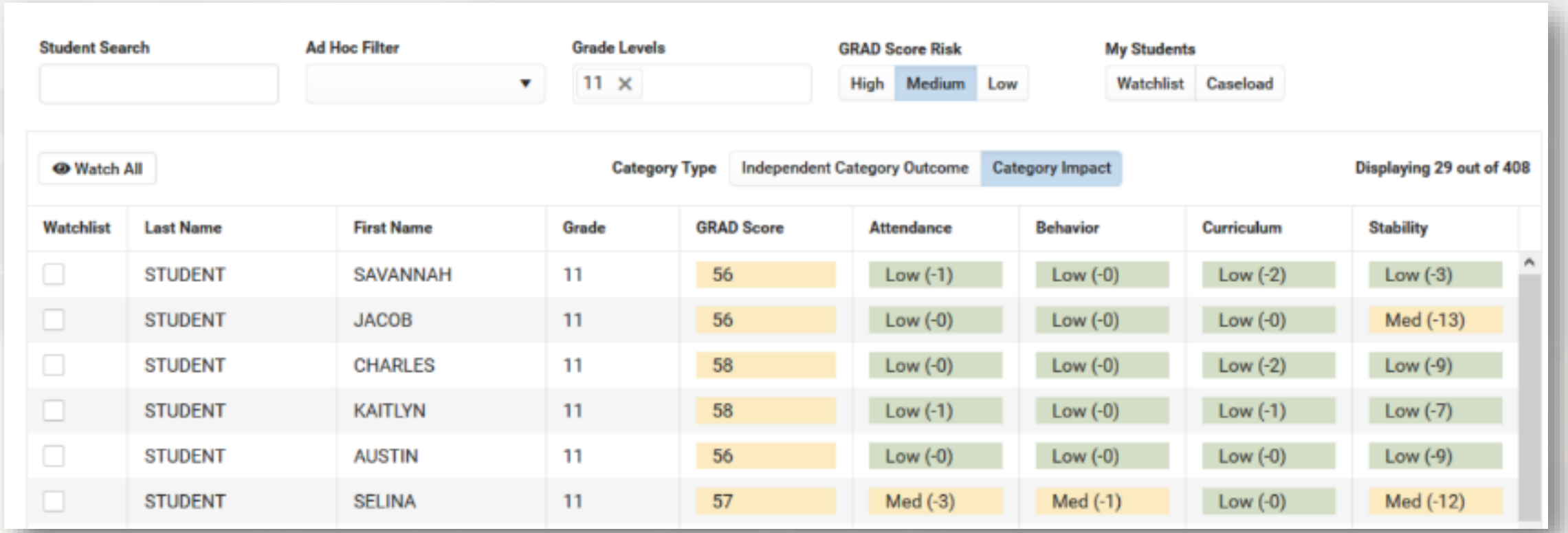
Cohorts, Watchlists and Caseloads



Watchlist	Last Name	First Name	Grade	GRAD Score	Attendance	Behavior	Curriculum	Stability
☐	STUDENT	SAVANNAH	11	56	Low (-1)	Low (-0)	Low (-2)	Low (-3)
☐	STUDENT	JACOB	11	56	Low (-0)	Low (-0)	Low (-0)	Med (-13)
☐	STUDENT	CHARLES	11	58	Low (-0)	Low (-0)	Low (-2)	Low (-9)
☐	STUDENT	KAITLYN	11	58	Low (-1)	Low (-0)	Low (-1)	Low (-7)
☐	STUDENT	AUSTIN	11	56	Low (-0)	Low (-0)	Low (-0)	Low (-9)
☐	STUDENT	SELINA	11	57	Med (-3)	Med (-1)	Low (-0)	Med (-12)

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Insights