Multiple Measures: Leveraging Student Data to Personalize Learning

Board of Education

February 6, 2019

Welcome & Introductions

Presenters

- Louis N. Wool, Superintendent
- Michael Greenfield: Assistant Superintendent for Curriculum & Instruction
- Brian Seligman, Director of Technology and CIO
- Kelly Malczewski, Director of Guidance

Presentation Overview

- Our Emerging Vision: Personalized Learning

- Multiple Measure Model:
  HRS - Marzano Group

- Building the Infrastructure:
  Data Systems - Decision Ed

- Analytics: IB Equity Project - Hanover Research

Why Personalized Learning?

Flexible Content and Tools
Instructional materials allow for differentiated path, pace, and performance tasks

Targeted Instruction
Instruction aligns to specific student needs and learning goals

Student Reflection and Ownership
Ongoing student reflection promotes ownership of learning

Data Driven Decisions
Frequent data collection informs instructional decisions and groupings

PERSONALIZED LEARNING THEORY

Learner profiles

Personal learning paths

Competency-based progression

Flexible learning environments

MULTIPLE MEASURES:THE WHOLE CHILD OR SELECTIVE PARTS?

The definition of multiple measures extends beyond multiple tests even if they are different types of tests or tests in other subject areas and multiple ways of analyzing test scores (e.g., absolute performance, achievement gaps, and growth).

For accountability systems to both capture and incentivize the full breadth of learning and support in schools, **they must also incorporate measures beyond standardized tests**.

WHAT DOES THE SYSTEM LOOK LIKE/WHAT DO WE MEAN BY MULTIPLE MEASURES?

Systems that reflect multiple measures of student success must incorporate a variety of measures that more fully reflect a comprehensive definition of student success, accurately measure student learning, and <u>systematically</u> track educators' efforts to engage and support learners. (ASCD)

Multiple assessments over multiple years are required to determine student development. Singular measure can actually be a misleading indicator of student performance.

WHAT DOES THE SYSTEM LOOK LIKE/WHAT DO WE MEAN BY MULTIPLE MEASURES?

More assessment data of a variety of types, **not less**, improves validity and enhances the differentiation of teacher practice.

Research indicates the effective use of student performance data in teacher evaluation requires an <u>array</u> of assessments representing different intervals of times throughout the year, and over multiple years, in order to be valid.

WHAT DOES THE SYSTEM LOOK LIKE/WHAT DO WE MEAN BY MULTIPLE MEASURES?

These include achievement, growth measures, end of course benchmark assessments, common assessments, SLOs (using proficiency scales), and student surveys/perception data.

None of these assessments is useful or credible in isolation of the other or in a singular year.

Multiple Measure Model

Personalized Learning — 5

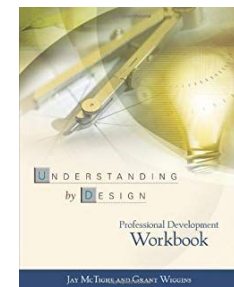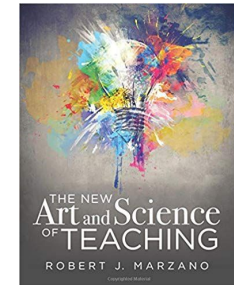Standards Referenced Reporting — 4
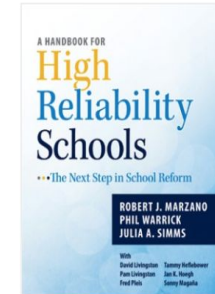
Guaranteed & Viable Curriculum — 3
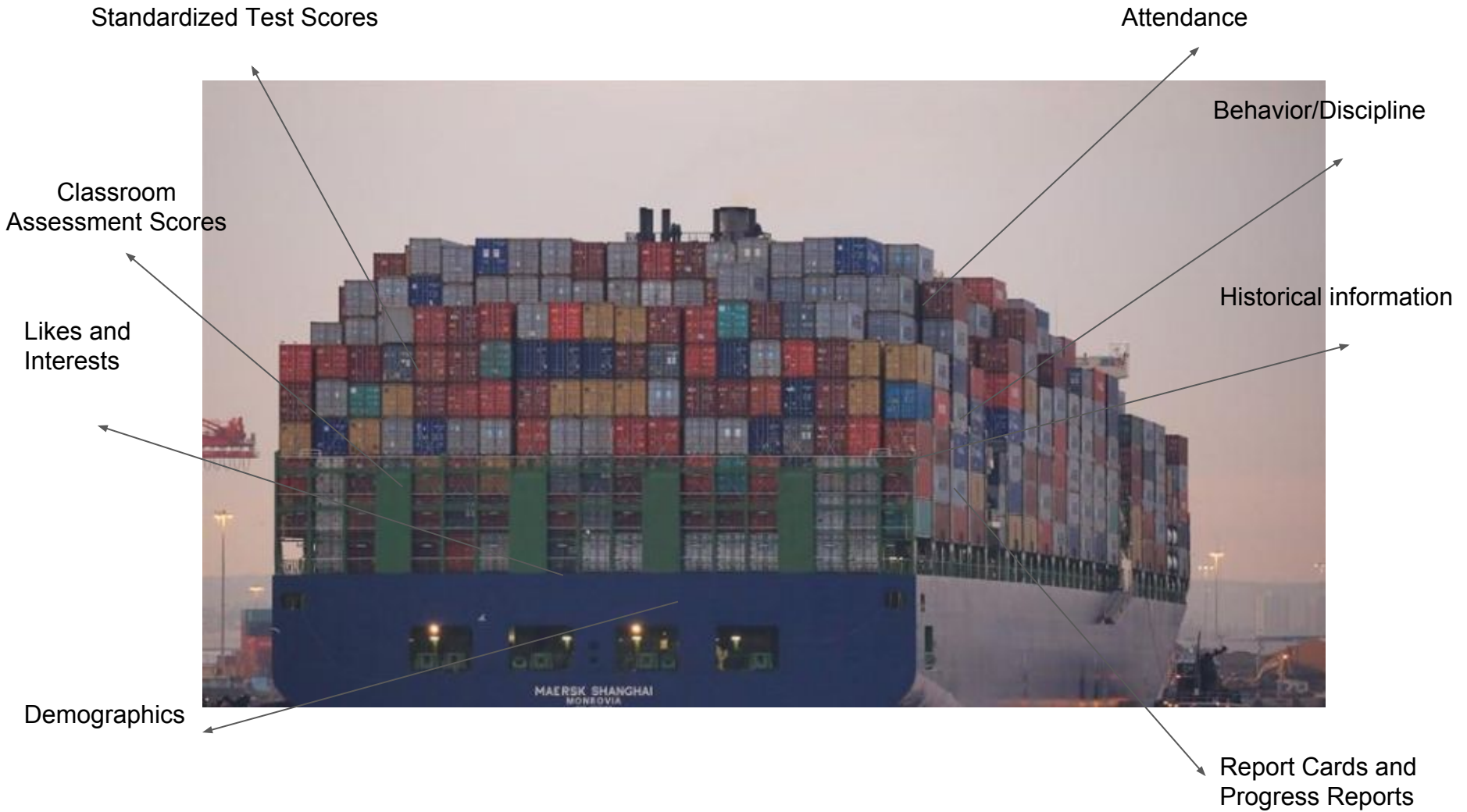
Effective Instruction — 2

Safe and Collaborative Culture — 1

Teachers and Administrators collect and analyze data...

Attendance

Standardized Test Scores

Behavior/Discipline

Classroom Assessment Scores

Historical information

Likes and Interests

Demographics

Report Cards and Progress Reports

However, data is stored in different places, making it difficult to find and organize.

Standardized Test Scores

Attendance

Behavior/Discipline

Classroom
Assessment Scores

Historical information
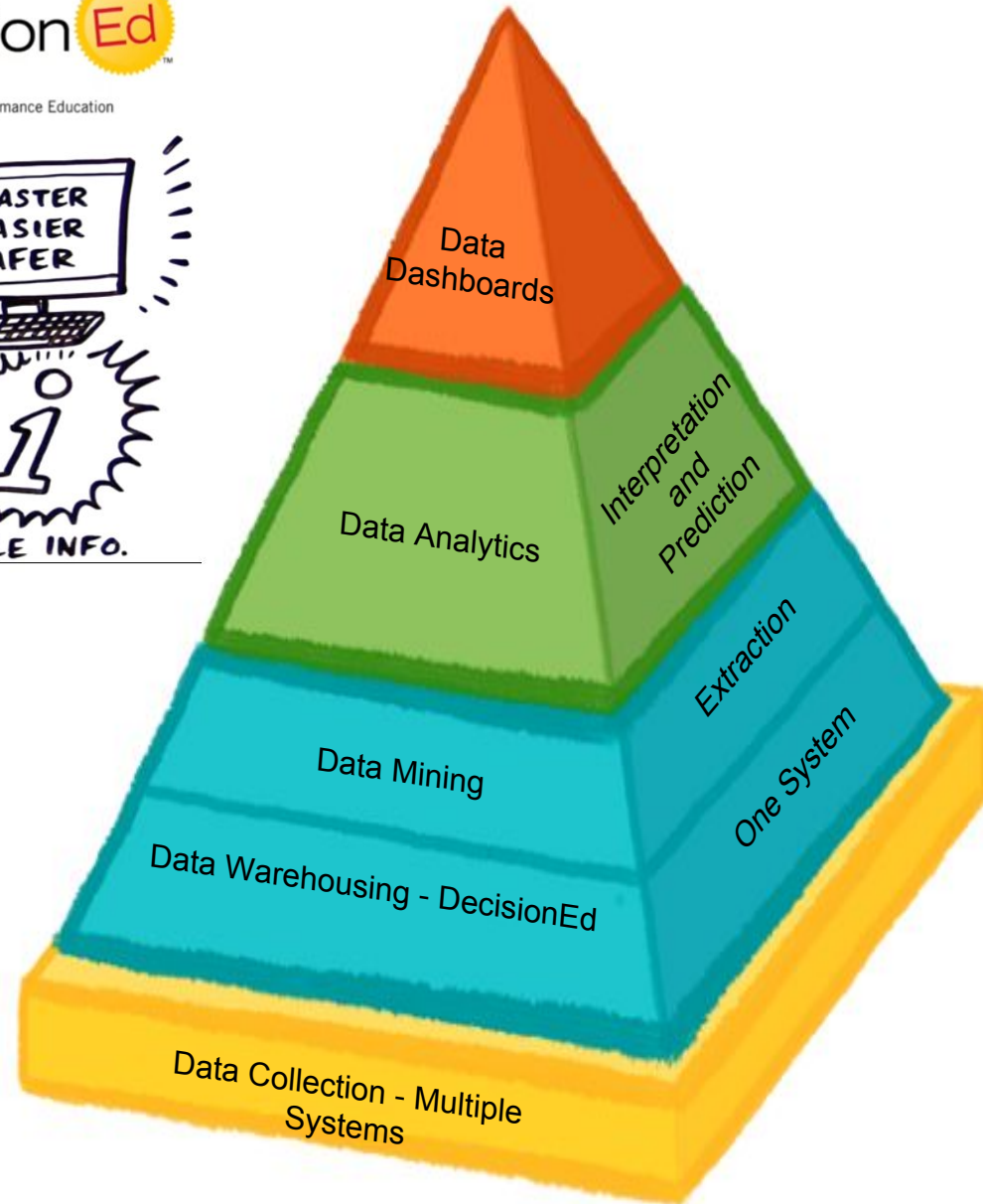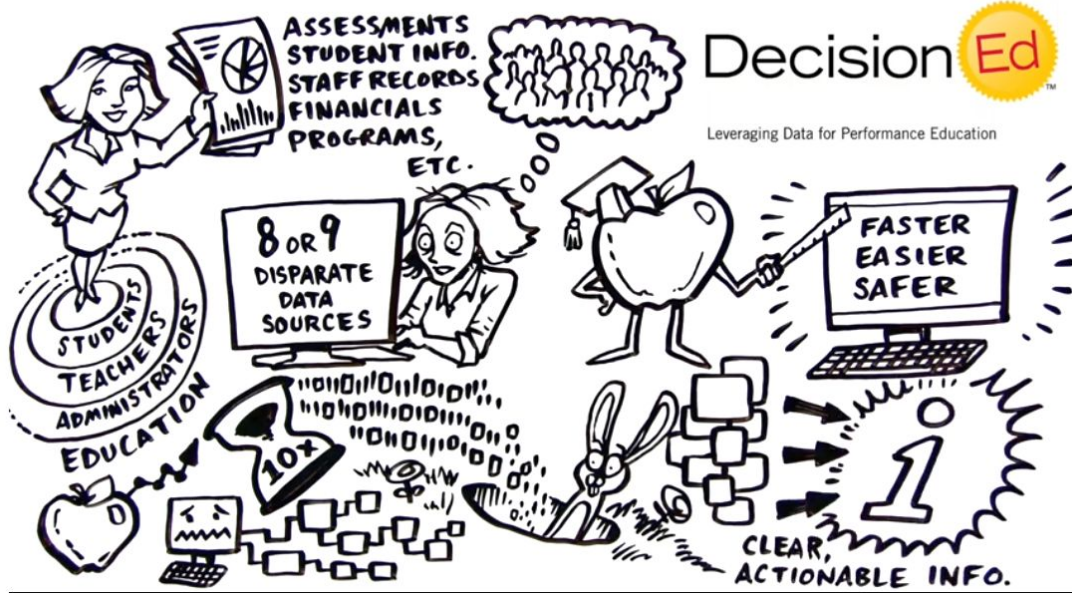
Likes and
Interests

Demographics

Report Cards and
Progress Reports

Accessing all the data can be challenging...
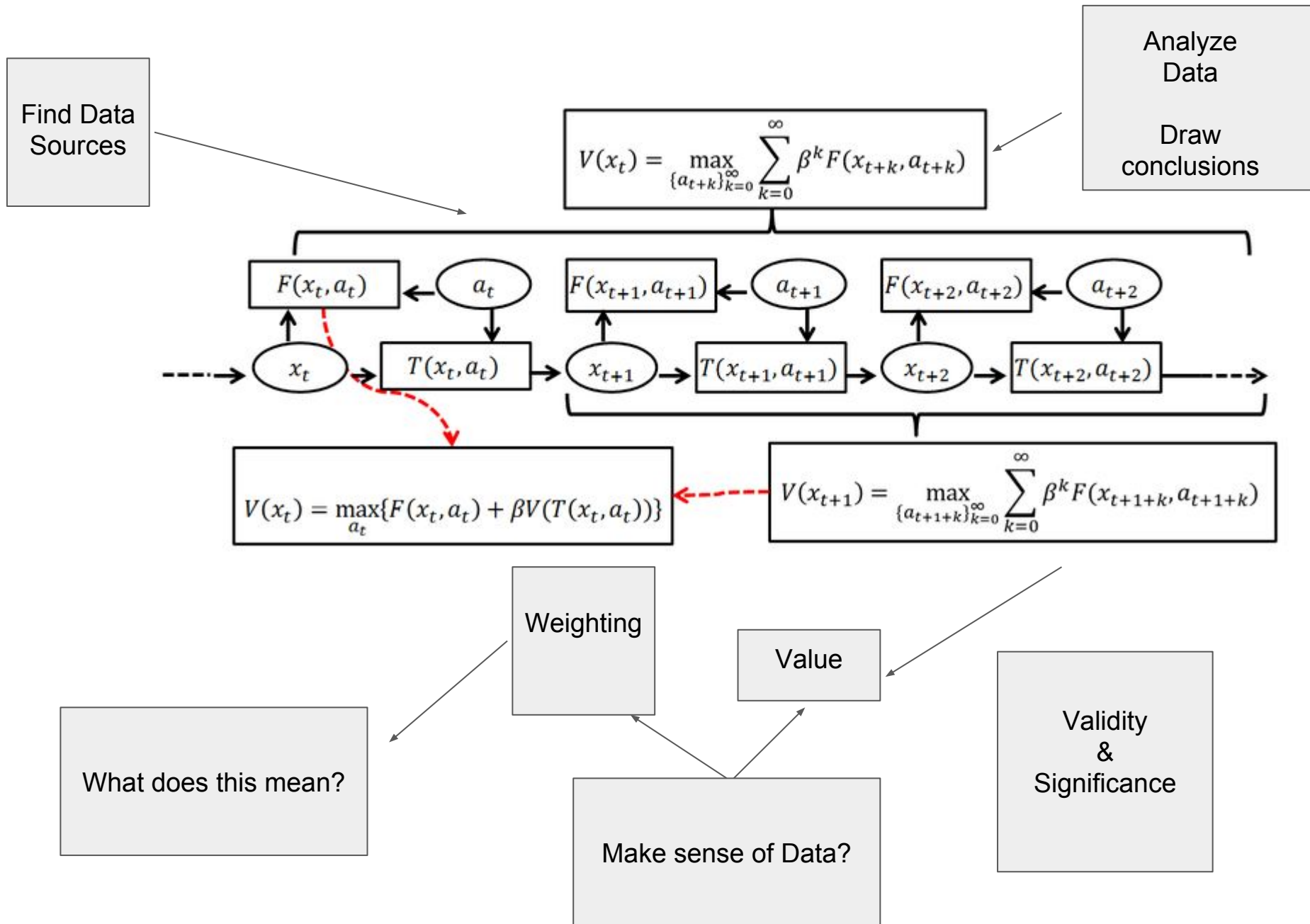
New Era for Data Collection, Mining, Analysis and Interpretation

What We Do

Data Dashboards

Data Analytics

Interpretation and Prediction

Extraction

Data Mining

One System

Data Warehousing - DecisionEd

Data Collection - Multiple Systems

IB Diploma Program:
An Equity Study

- To what extent is Harrison realizing our equity-driven mission through the IB Diploma Program?

- To what extent do students feel prepared for and supported as IB Diploma students?

Purpose of Research

- Identify and recruit potential IB Diploma candidates from 9th and 10th grade

- Improve and/or add support structures to recruit, retain and support students in the IB Program (DP and non-DP)

IB 5 Year Review

As you can see from the report, the following area(s) of programme implementation were identified as particular strengths in the evaluation report: the support of the school and district leadership, the variety of opportunities that students have within the academic and CAS programmes, the commitment to access by the school, and the availability of professional development opportunities to your staff...

...In addition, I hope you do not mind that we have shared the good practice we have found in your school internally across the IB to alert our colleagues to the expertise you have to offer.

Once again, we would like to congratulate you on the strong programme implementation that was evident in your self-study.

David Weiss, Head of U.S. Schools
International Baccalaureate Program

HHS IB Diploma Program

Graduation Year	IB Diploma Candidates	% of Total Class	% Earning Diploma*	% of Students Participating
2013	58	21%	78%	89%
2014	59	24%	92%	90%
2015	67	27%	85%	93%
2016	85	34%	84%	94%
2017	93	36%	86%	95%
2018	87	32%	74%	96%
2019	80	30%		
2020	85	34%		
2021	97	35%		

Worldwide average of IB candidates earning the Diploma is 79%.

Methodology

1. Collect and analyze student perception data
2. Collect and analyze academic and demographic indicators
3. Correlate academic & demographic indicators with student perception data
4. Develop regression model as predictive tool
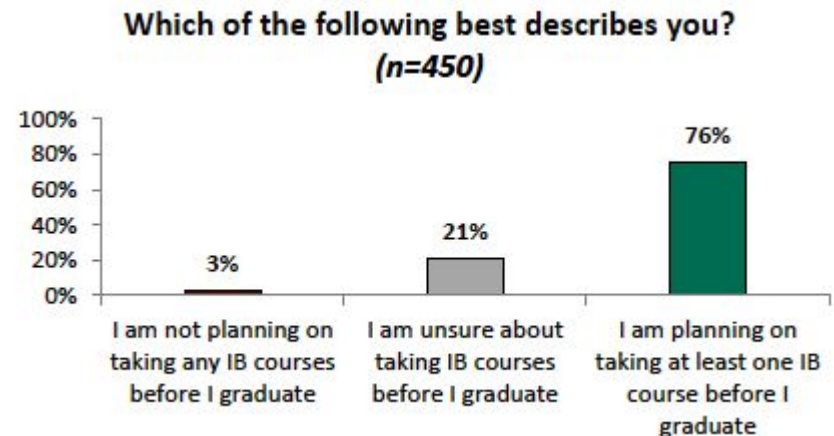5. Build dashboard and data supplement
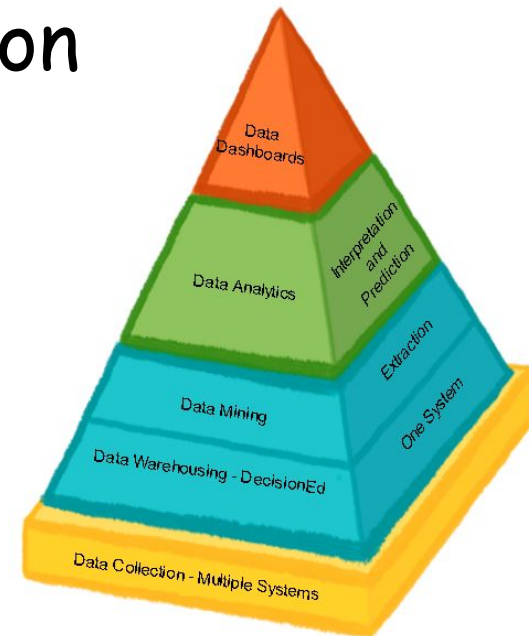
Student Perceptions...

Most students have a positive perception of the IB Program:

- Academic rigor and depth of content
- Student-teacher relationships and support
- Extended opportunities e.g. CAS, TOK and EE

Almost 50% of 9th graders plan to pursue the IB Diploma

Which of the following best describes you?
(n=450)

	3%	21%	76%
	I am not planning on taking any IB courses before I graduate	I am unsure about taking IB courses before I graduate	I am planning on taking at least one IB course before I graduate

Equity Study: Highly Correlated Factors

➔ Free-Reduced Lunch Status
➔ Gender
➔ 8th Grade MAP (ELA/Math)
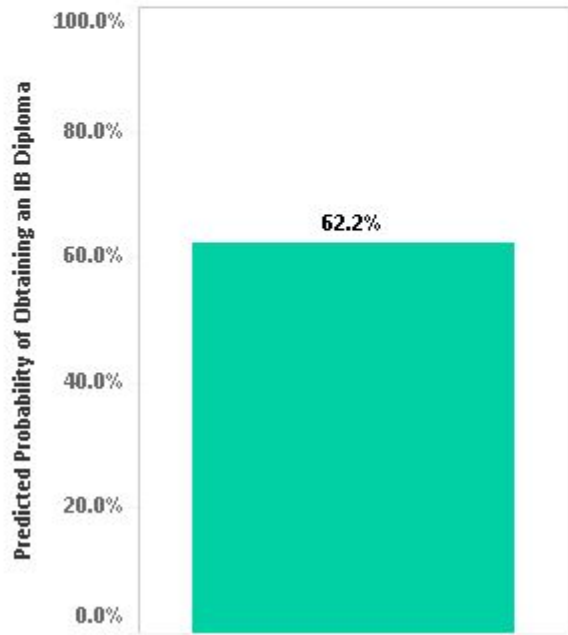
❏ Ethnicity
❏ 8th Grade Absences

Predictive Analytics Dashboard

REGRESSION ANALYSIS – INTERACTIVE DASHBOARD

This **interactive dashboard** allows you to estimate a hypothetical student's predicted probability of obtaining an IB diploma by the end of Grade 12 at Harrison based on Grade 8 academic and attendance data, as well as Grade 9 demographic data for Cohorts 2015 to 2018.

Figure 5: Predicted Probability of Obtaining an IB Diploma

62.2%

Grade 8 MAP Math Fall Percentile (Range: 0-99)
99

Grade 8 MAP Reading Fall Percentile (Range: 0-99)
99

Grade 8 Average Absences
0.00

Grade 9 Gender
Male

Grade 9 Race/Ethnicity
White

Grade 9 Poverty Status
In Poverty

Interpreting Analytics

Predicted Probability of Obtaining an IB Diploma	Grade 8 MAP Results & Absences		Grade 9 Demographic Characteristics				Survey Responses (Fall 2017)	
	Grade 8 MAP Math & Reading Avg. Percentile	Grade 8 Average Absences	Grade 9 Gender	Grade 9 Race/Ethnicity	Grade 9 Poverty Status	Grade 9 Student with Disability	Which of the following best describes you?	Are you planning to pursue the International Baccalaureate (IB) Diploma?
84.0%	98	1	Male	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
79.2%	90	4	Female	White	Not in Poverty	Students without Disabilities	I am unsure about taking IB courses bet	I am not sure
71.9%	88	7	Female	White	Not in Poverty	Students without Disabilities	I am unsure about taking IB courses bet	I am not sure
71.1%	90	19	Female	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
68.4%	94	1	Male	Asian or Pacific Islander	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
68.3%	96	8	Male	Hispanic or Latino	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
61.9%	93	18	Male	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
61.3%	86	15	Female	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
60.4%	92	18	Male	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
58.3%	86	4	Female	Hispanic or Latino	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
56.9%	81	2	Female	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
56.2%	89	9	Male	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
55.7%	82	8	Female	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
55.5%	81	4	Female	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
52.3%	80	2	Female	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
47.4%	88	7	Male	Black or African American	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
45.3%	82	7	Female	Hispanic or Latino	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
41.4%	83	6	Male	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
40.6%	79	4	Female	Black or African American	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
39.3%	76	3	Female	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
37.9%	76	5	Female	White	Not in Poverty	Students without Disabilities	I am planning on taking at least one IB c	I am not sure
35.8%	75	6	Female	White	Not in Poverty	Students without Disabilities	I am unsure about taking IB courses bet	I am not sure

Actionable Data

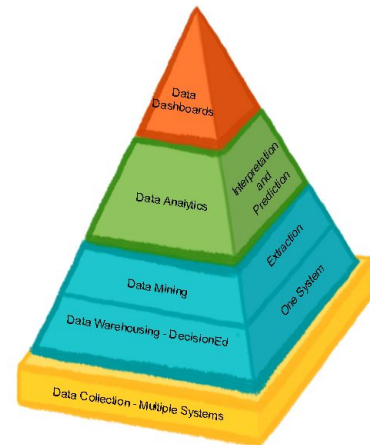| Predicted Probability of Obtaining an IB Diploma	Grade 8 MAP Results & Absences		Grade 9 Demographic Characteristic		
	Grade 8 MAP Math & Reading Avg. Percentile	Grade 8 Average Absences	Grade 9 Gender	Grade 9 Race/Ethnicity	Grade 9 Poverty Status
62.3%	97	2	Female	Hispanic or Latino	In Poverty
13.4%	85	4	Male	Hispanic or Latino	In Poverty
12.8%	81	4	Male	White	In Poverty
5.8%	79	10	Male	Hispanic or Latino	In Poverty
11.2%	77	3	Female	Hispanic or Latino	In Poverty
10.6%	76	3	Female	Hispanic or Latino	In Poverty
10.3%	75	0	Female	Hispanic or Latino	In Poverty
9.1%	74	2	Female	Asian or Pacific Islander	In Poverty

Making use of the tools in an actionable way...

- Hanover Equity Study-Predictive Analytics & School Counselors

- Shifts to Current Program
  - Academic Advisement- "I have data to support that you will do well in this course of study..."
  - Post-Secondary Goals

- Student-Specific Support

Potential Applications...

- IB Profile and Predictive Data
- Netflix Model - Audible, Spotify, etc.
  - Course recommendations
  - College application recommendations
- Automatic Flagging for negative patterns, possible negative outcomes
  - Attendance
  - Discipline
  - Course grade decline/significant changes/failures
- Using Watson's analytics engine we can ask questions
  - Program success
  - Student outcomes

Questions & Answers