SCHOOL PROGRESS REPORT
ORAL PRESENTATION
Introduction
About Education Analytics (EA)

- Non-profit organization
- Located in Madison, Wisconsin
- Today: Andrew Rice
  - Executive VP of Research and Operations
  - Advisor to states and districts on accountability measures, data systems, data policy, and advanced analytics.

www.edanalytics.org
EA Mission and Service Areas

- Mission: “Conducting research and developing policy and management analytics to support continuous improvement in American education”
- Main Service Areas
  - Accountability and growth metric development and implementation
  - Advanced analytics for policy use
  - District created Assessment design and implementation
  - Education policy
  - Technical assistance
Districts and States Where our Team has Worked on Data and Analytics

- Minneapolis
- Milwaukee
- Racine
- Chicago
- Madison
- Tulsa
- Atlanta
- New York City
- Hillsborough County
- NORTH DAKOTA
- SOUTH DAKOTA
- MINNESOTA
- IOWA
- WISCONSIN
- ILLINOIS
- MICHIGAN
- NEW YORK
- OKLAHOMA
- TENNESSEE
- SAN FRANCISCO
-Sacramento
-Sanger
-Clovis
-Fresno
-Garden Grove
-Santa Ana
-Los Angeles
-Long Beach
-Oakland
-Philadelphia
-Chicago
-Delaware
-Atlanta
-Houston
-Collier County

Education Analytics INC.
Growth Models in General
A Growth Model is Designed to Measure the Effect of the Education System on Student Growth
Growth models use statistical techniques to isolate the impact of the education system from non-school factors.
Types of Growth Models

- Simple Growth
  - Simple subtraction
  - Value Tables

- Regression Based Growth
  - SGP
  - Value-added
  - Growth to Proficiency
Scale Score Models

- Subtraction – points for scale score movement
  - Only available in vertically equated assessment
  - Pro: simple as can be
  - Con: Comparison between grades is bad -- more on this later

- Value Table – points for movement between proficiency levels
  - Pro: Allows value judgment on band movement
  - Con: Very high grain size – can get very complicated if many policy values being measured
Growth Models

Student Exceeded Average Growth by 5 Points

Student Did Not Meet Average Growth by 4 Points
Growth to Proficiency (AGP)
Growth to Proficiency (AGP)
Growth to Proficiency (AGP)
Regression Models

- Growth Models
  - Pro: well specified models can really isolate impact of schools on student growth
  - Con: relatively complex for stakeholder understanding

- Growth to Proficiency
  - Pro: relatively easy to explain (on track to proficiency)
  - Con: significant portion of measure is dependent on starting point
  - A mix of growth and proficiency
Neutrality in Urban Contexts
Schools Sorted by Poverty Group

Low-Poverty Schools
- School A
- School B
- School C
- School D
- School E
- School F

Mid-Poverty Schools
- School G
- School H
- School I
- School J
- School K
- School L

High-Poverty Schools
- School M
- School N
- School O
- School P
- School Q
- School R

Key
- High Growth
- Average Growth
- Low Growth

Now, color code the schools by their SGP result using different models
Completely Neutral Model

Key
- **High Growth**
- **Average Growth**
- **Low Growth**

Schools:
- **Low-Poverty Schools**:
  - School A
  - School B
  - School C
  - School D
  - School E
  - School F

- **Mid-Poverty Schools**:
  - School G
  - School H
  - School I
  - School J
  - School K
  - School L

- **High-Poverty Schools**:
  - School M
  - School N
  - School O
  - School P
  - School Q
  - School R
Non-Neutral Model

Key
- **High Growth**
- **Average Growth**
- **Low Growth**

- **Low-Poverty Schools**
  - School A
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  - School M
  - School N
  - School O
  - School P
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  - School R
Neutrality for Urban Districts

- Neutrality is good:
  - When it makes impact transparent
  - When results are neutral to non-changing factors

- Neutrality is bad:
  - When it hides impact

- Non-neutral models tend to disfavor:
  - High FRL%, high ELL%, high SPED% schools
What models relate to neutrality

- Non-Neutral
  - Proficiency
  - Value-Tables
  - Growth to Proficiency
  - Subtraction
- Somewhat Neutral
  - SGP, some value-added models
- Completely-neutral
  - “Fully loaded” regression model
Ratings
Index Metric Performance Thresholds

- **Stage 1**: Red/orange/green
- **Stage 2**: Levels within colors
- These are all policy decisions
Method 1: Everything by Growth Percentile Ranges

Growth Percentile

Equal Percentile Ranges

Equal Number of Schools Per Level
Method 1: Everything by Growth Percentile Ranges

Growth Percentile

Level 1  Level 2  Level 3  Level 4  Level 5  Level 6  Level 7  Level 8  Level 9  Level 10

Low  High  Low  High  Low  High  Low  High  Low  High  Low  High  Low  High  Low  High  Low  High  Low  High

0  24  25  35  36  42  43  46  47  49  50  52  53  56  57  63  64  74  75  100
Method 2: Color by Confidence Interval, Level by Growth Percentile

Result is “Orange” (Levels 4-7) if confidence interval includes “average growth” (The school’s contribution to student growth cannot be distinguished from average)
Method 2: Color by Confidence Interval, Level by Growth Percentile

Result is “Red” (Levels 1-3) if confidence interval is entirely below “average growth”

Result is “Green” (Levels 8-10) if confidence interval is entirely above “average growth”
Method 2: Color by Confidence Interval, Level by Growth Percentile

Then determine Level by Growth Percentile.
Method 3: Everything by Confidence Interval

Then determine Level by Confidence Interval Bounds

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
<th>Level 6</th>
<th>Level 7</th>
<th>Level 8</th>
<th>Level 9</th>
<th>Level 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>UB 0</td>
<td>UB 29</td>
<td>UB 30</td>
<td>UB 39</td>
<td>UB 40</td>
<td>UB 49</td>
<td>LB 0</td>
<td>LB 29</td>
<td>LB 30</td>
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<td></td>
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</tr>
</tbody>
</table>
# Example Scenario

## School A

- 500 students/grade

<table>
<thead>
<tr>
<th>Grade</th>
<th>0</th>
<th>25</th>
<th>50</th>
<th>75</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td></td>
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<td></td>
<td>55</td>
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<tr>
<td>7th</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>8th</td>
<td></td>
<td></td>
<td></td>
<td>30</td>
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</tr>
</tbody>
</table>

## School B

- 60 students/grade

<table>
<thead>
<tr>
<th>Grade</th>
<th>0</th>
<th>25</th>
<th>50</th>
<th>75</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>55</td>
</tr>
<tr>
<td>7th</td>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>8th</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>
### Example Scenario

<table>
<thead>
<tr>
<th>School A</th>
<th>500 students/grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th</td>
<td>Overall</td>
</tr>
<tr>
<td>7th</td>
<td>Overall</td>
</tr>
<tr>
<td>8th</td>
<td>Overall</td>
</tr>
<tr>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>100</td>
<td>55</td>
</tr>
<tr>
<td>30</td>
<td>60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>School B</th>
<th>60 students/grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th</td>
<td>Overall</td>
</tr>
<tr>
<td>7th</td>
<td>Overall</td>
</tr>
<tr>
<td>8th</td>
<td>Overall</td>
</tr>
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</tr>
<tr>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>100</td>
<td>55</td>
</tr>
<tr>
<td>30</td>
<td>60</td>
</tr>
</tbody>
</table>
Example Scenario: Method 1 with potential “equal school number per level” cutoffs

<table>
<thead>
<tr>
<th>School A</th>
<th>500 students/grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th</td>
<td>55</td>
</tr>
<tr>
<td>7th</td>
<td></td>
</tr>
<tr>
<td>8th</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>School B</th>
<th>60 students/grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th</td>
<td>55</td>
</tr>
<tr>
<td>7th</td>
<td></td>
</tr>
<tr>
<td>8th</td>
<td>30</td>
</tr>
</tbody>
</table>
Example Scenario: Method 2 / Method 3 with potential confidence interval rules

School A: 500 students/grade

- Overall
- 6th
- 7th
- 8th

School B: 60 students/grade

- Overall
- 6th
- 7th
- 8th
So What?

- Small schools have more noise in growth models
  - Especially true with SGP
- Real measures of error are important to know when rating schools
  - True of other measures too but tends to be ignored
Scale for Reporting
Reporting in Scale Score Growth

- This section: Illustrating the difficulty of reporting school-level metrics in scale score growth
Scale Score Growth

Assumption for illustration: Typical student growth puts students “on track” to stay in their achievement level.

SBAC score ranges used in illustrative example
## “Standard Met” Scale Score Range

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimum Scale Score</th>
<th>Maximum Scale Score</th>
<th>Achievement Level Scale Score Range for Standard Not Met</th>
<th>Achievement Level Scale Score Range for Standard Nearly Met</th>
<th>Achievement Level Scale Score Range for Standard Met</th>
<th>Achievement Level Scale Score Range for Standard Exceeded</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2114</td>
<td>2623</td>
<td>2114–2366</td>
<td>2367–2431</td>
<td>2432–2489</td>
<td>2490–2623</td>
</tr>
<tr>
<td>4</td>
<td>2131</td>
<td>2663</td>
<td>2131–2415</td>
<td>2416–2472</td>
<td>2473–2532</td>
<td>2533–2663</td>
</tr>
<tr>
<td>5</td>
<td>2201</td>
<td>2701</td>
<td>2201–2441</td>
<td>2442–2501</td>
<td>2502–2581</td>
<td>2582–2701</td>
</tr>
<tr>
<td>6</td>
<td>2210</td>
<td>2724</td>
<td>2210–2456</td>
<td>2457–2530</td>
<td>2531–2617</td>
<td>2618–2724</td>
</tr>
<tr>
<td>7</td>
<td>2258</td>
<td>2745</td>
<td>2258–2478</td>
<td>2479–2551</td>
<td>2552–2648</td>
<td>2649–2745</td>
</tr>
<tr>
<td>8</td>
<td>2288</td>
<td>2769</td>
<td>2288–2486</td>
<td>2487–2566</td>
<td>2567–2667</td>
<td>2668–2769</td>
</tr>
<tr>
<td>11</td>
<td>2299</td>
<td>2795</td>
<td>2299–2492</td>
<td>2493–2582</td>
<td>2583–2681</td>
<td>2682–2795</td>
</tr>
</tbody>
</table>
“Growth to Meet Standard” if Score Ranges are Horizontally Stable

<table>
<thead>
<tr>
<th>Grade</th>
<th>Achievement Level</th>
<th>Scale Score Range for Standard Met</th>
<th>Growth Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td>2432–2489</td>
<td>+42</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>2473–2532</td>
<td>+39</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>2502–2581</td>
<td>+32.5</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>2531–2617</td>
<td>+26</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>2552–2648</td>
<td>+17</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>2567–2667</td>
<td></td>
</tr>
</tbody>
</table>

A 3rd grader in the middle of the “Standards Met” range (2460.5) needs to grow 42 scale score points to remain in the middle of the “Standards Met” range in 4th grade (2502.5).
# Scale Score Growth at School Level

<table>
<thead>
<tr>
<th>Grade</th>
<th>Achievement Level Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2432–2489</td>
</tr>
<tr>
<td>4</td>
<td>2473–2532</td>
</tr>
<tr>
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<td>2502–2581</td>
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<td>7</td>
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</tr>
</tbody>
</table>

+39
+32.5
+26
+17

**Elementary Grades**

~40 points of growth

**Middle Grades**

~25 points of growth
Growth in Accountability Systems
Where does Growth Fit

- Theory of accountability models:
  - Hold the education system accountable for outcomes it has impact on
- Proficiency measures are mostly about neighborhood: useful information but not actionable
- Growth measures take away the free pass to rich neighborhoods
- Urban districts tend to look better on growth than proficiency
Growth on Other Metrics

- ESSA makes strong requirements on ELP growth
  - WIDA can be used in a growth model
  - Relatively new ground in the field
- Graduation rates can be used in a “growth model”
  - “4% above schools with similar students”
- Measuring impact properly can only help urban districts
  - History of status driven metrics that disfavor urban districts
Discussion
Discussion Questions

- Given the information presented, what opportunities do you see to improve your state/district’s current implementation and use of growth models?
- How is your state/district thinking about the new opportunities/requirements afforded by the ELP growth components of ESSA?
- How could your district/state best use the growth idea on non-assessment measures like graduation or chronic absenteeism?