Academic Accountability
Understanding the Value-Added Model

Nnenna Ogbu
Governor’s Office of Student Achievement

State Charter Schools Commission of Georgia
School Governance Training
February 11, 2016
Presentation Outline

- Value-Added Model/Student Growth Model
  - Goal and Challenges of Evaluation
  - Methods of Evaluation
  - Data Used
  - Interpretation of Results
Goal and Challenges of the Evaluation

– Goal
  – To evaluate the performance of the state charter schools operating under the authority of the State Charter Schools Commission

– Challenges
  – Students and their families choose to attend a state charter rather than a locally authorized charter or a traditional public school.
  – Simple comparisons of average test scores may reflect ability/motivation/resources of students rather than the quality of the school they attend.
  – State charter schools frequently serve students from multiple counties and have specialized missions.
Value-Added Model (VAM)

- What is it?
  - VAM is a statistical model that predicts what a student’s test score would be based on his/her prior test scores and demographic characteristics

- What does it measure?
  - VAM measures the contribution to student achievement by estimating the difference between the actual and predicted test score
Value-Added Model (VAM)

- How is it reported for state charter schools?
  - VAM reports the estimated *school effect*, which is essentially the difference between the actual and predicted test score for each student, averaged over all students in a school
  - VAM uses a reference point, set to have an effect of zero, as the average school effect for a given grade range in the state
  - Test scores are “normalized” by grade and year in order to compare test scores across grades and years
Data for Value-Added Modeling

- **Student-level data from GA•AWARDS**
  - Test Scores
    - End-of-grade scores for grades 3-8
    - End-of-course scores in high school

- **Student Demographics**
  - Gender, age in grade, foreign-born indicator, race/ethnicity, ESOL enrollment, free/reduced-price lunch eligibility, gifted status, primary-language-not-English indicator, disability status (15 specific disability categories), number of schools attended in the current year, an indicator for students who changed schools from the prior year, number of disciplinary incidents in the prior year, and attendance in the prior year
Example of VAM Findings

Performance of State Charters Relative to All Schools in Georgia – Grades 6, 7 and 8, Reading

School Value-Added Estimate with 95% Confidence Intervals
(Mean Effect with all controls across all Georgia public schools = 0)
### Example of VAM Findings

**Summary by Grade Level and Subject**

<table>
<thead>
<tr>
<th>Grade Level and Subject</th>
<th>Value-Added</th>
<th>District Rank</th>
<th>Statistically Different From District Average?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Controls for Student Demographics and Prior Test Scores)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>School Effect</td>
<td>State Percentile (higher is better)</td>
<td>Statistically Different From State Average?</td>
</tr>
<tr>
<td>Middle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td>0.2748</td>
<td>99</td>
<td>Higher</td>
</tr>
<tr>
<td>ELA</td>
<td>0.2197</td>
<td>98</td>
<td>Higher</td>
</tr>
<tr>
<td>Math</td>
<td>-0.0113</td>
<td>49</td>
<td>No</td>
</tr>
<tr>
<td>Science</td>
<td>-0.0705</td>
<td>27</td>
<td>No</td>
</tr>
<tr>
<td>Social Studies</td>
<td>0.1128</td>
<td>77</td>
<td>Higher</td>
</tr>
<tr>
<td>All-Subject Average</td>
<td>0.1033</td>
<td>89</td>
<td>Higher</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9th Grade Lit.</td>
<td>0.3009</td>
<td>98</td>
<td>Higher</td>
</tr>
<tr>
<td>Coordinate Algebra</td>
<td>0.2485</td>
<td>92</td>
<td>Higher</td>
</tr>
<tr>
<td>Physical Science</td>
<td>-0.0105</td>
<td>50</td>
<td>No</td>
</tr>
</tbody>
</table>

Note: statistical significance based on a 95 percent confidence level.
Georgia’s Student Growth Model

– The student growth model calculates a ranking of a student’s current test score relative to other students with the same prior-year score.

– The student growth model yields a “student growth percentile” (SGP).
  – By definition, the median SGP is 50.

– SGPs are calculated by GaDOE.

– The SCSC annual accountability report also includes mean SGPs aggregated to the school-level.
Example of SGP Findings

Performance of State Charters Relative to All Schools in Georgia-
9th Grade Literature

Mean Student Growth Percentile
(Median SGP across all Georgia public school students = 50)
## Example of SGP Findings

### Summary by Grade Level and Subject

<table>
<thead>
<tr>
<th>Grade Level and Subject</th>
<th>School Mean of Individual SGPs</th>
<th>State Percentile (higher is better)</th>
<th>District Rank (lower is better)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Middle</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td>63</td>
<td>95</td>
<td>2 of 24</td>
</tr>
<tr>
<td>ELA</td>
<td>49</td>
<td>56</td>
<td>14 of 24</td>
</tr>
<tr>
<td>Math</td>
<td>44</td>
<td>33</td>
<td>16 of 24</td>
</tr>
<tr>
<td>Science</td>
<td>47</td>
<td>30</td>
<td>15 of 24</td>
</tr>
<tr>
<td>Social Studies</td>
<td>53</td>
<td>71</td>
<td>6 of 24</td>
</tr>
<tr>
<td><strong>All-Subject Average</strong></td>
<td>51</td>
<td>55</td>
<td>12 of 24</td>
</tr>
<tr>
<td><strong>High</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9th Grade Lit.</td>
<td>65</td>
<td>99</td>
<td>1 of 19</td>
</tr>
<tr>
<td>Coordinate Algebra</td>
<td>52</td>
<td>59</td>
<td>11 of 18</td>
</tr>
<tr>
<td>Physical Science</td>
<td>48</td>
<td>52</td>
<td>10 of 19</td>
</tr>
</tbody>
</table>

Note: statistical significance based on a 95 percent confidence level.
Comparison of VAM and Student Growth Model

– The annual SCSC accountability report includes results from the VAM and the Student Growth Model

– Theoretically, both models compare each student’s performance to a reference standard
  – VAM: expected score of students with similar observable characteristics and prior scores
  – Student Growth Model: actual performance of students with same prior-year score (or history of scores)
Comparison of VAM and Student Growth Model

–VAM measures how much a student’s score exceeds the expected score; the Student Growth Model uses rankings

–VAM publishes a measure of uncertainty of the estimated school effects (standard error); the Student Growth Model does not

–Student Growth Model accounts for prior test scores but does not explicitly control for differences in student characteristics
Alternative Method: Proficiency Benchmarks

–Proportion of students whose test scores meet or exceed a pre-determined threshold

–Unlike VAM and Student Growth Model, yields an absolute measure of school performance
  –All schools could potentially improve from one year to the next

–Measures level of student achievement, not growth
  –Student achievement may reflect both school performance and ability/motivation/resources of students

–As a result, the annual accountability report focuses on school performance estimates from VAM and student growth model
Questions?

Contact Information
Nnenna Ogbu
Research and Evaluation Specialist
nogbu@georgia.gov
(404) 295-4307