

## STUDENT GROWTH PILOT PROJECT


### Professional Development Webinar #1

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National Center for the Improvement of Educational Assessment

April 18, 2011 Missouri Department of Elementary and Secondary Education


## 2 Session Agenda: Student Growth Percentiles, Part 1

- 1) *EXPLORING STUDENT GROWTH IN MISSOURI: CHANGING CONVERSATIONS ABOUT EDUCATION*
- 2) *QUESTIONS & COMMENTS VIA WRITTEN "CHAT"*
- 3) *REMINDER ABOUT NEXT WEBINAR*



## 3 Goals for PD sessions focusing on Student Growth Percentiles (4/18 & 4/20)

- 1) Describe the benefits of MAP Student Growth Percentiles.
- 2) Interpret Student Growth Percentiles at the individual student level, the building level, and the district level.
- 3) Explain how to appropriately use Student Growth Percentiles to inform various types of decisions about individual students and groups of students.
- 4) Explain any caveats or considerations to keep in mind relative to the use of Student Growth Percentiles.



The Big Picture  
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### Exploring Student Growth in Missouri Changing Conversations about Education

Damian W. Betebenner  
National Center for the Improvement of Educational Assessment  
Dover, New Hampshire

Missouri Department of Education Webinar  
April 18th, 2011

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### About Me

**Dr. Damian Betebenner, PhD**  
Senior Associate at the Center for Assessment (NCIEA). Developed student growth percentiles and percentile growth trajectories to help states and educational associations employ student growth in decision making [Betebenner, 2008, Betebenner, 2009]. Currently refining and sharing these techniques with other states including Colorado, Massachusetts, Arizona, Indiana, as well as more than a dozen other states in various stages of investigation/adoption.

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### Today's Topics

- Questions that a growth model can/should address.
- Student growth percentiles.
- Student growth versus value-added
- Changing conversations around education using growth data.

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The Data Revolution  
Why Growth?  
Accountability and Growth

### Data Data Everywhere

**Enhanced data acquisition and management has enabled:**

- Historical (i.e., longitudinal) records of student achievement
- Linkage of student demographics, teachers, schools, educational programs with student achievement data
- Stakeholder interest in an examination of this longitudinal data
- Interest in examining student achievement over time (student growth) derives from data availability.
- *Data ≠ Information*

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The Data Revolution  
Why Growth?  
Accountability and Growth

### The attractiveness of growth

**What is growth and why measure it?**

- Student learning is a central goal of education.
- Assessments of student achievement provide evidence of the current status of student knowledge and understanding.
- Learning is demonstrated by growth in student achievement from one point in time to another point in time—not by status at either point time alone.
- Education as a process (indicated by growth) as opposed to a destination (indicated by status)

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The Data Revolution  
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### Accountability & Growth

**Growth versus Status**

- Enthusiasm for growth in accountability stems from the belief that growth and teacher/school quality are more closely related than status.
- Enthusiasm for growth also stems from its potential diagnostic uses.
- How do we judge the use of growth related measures within an accountability system?

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Guiding Principles  
Guiding Questions

### Lessons Learned

On Questions John Tukey  
It is better to have an approximate answer to the right question than a precise answer to the wrong question.

On Statistical Models George E. P. Box  
All models are wrong but some are useful.

On Understanding Aristotle  
We understand best those things we see emerge from their very beginnings.

On Accountability Sherlock Holmes  
It is a capital mistake to theorize before you have all the evidence. It biases the judgment.

On Theories of Action Confucius  
Tell me and I will forget, show me and I will remember, involve me and I will understand.

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Guiding Questions

### Guiding questions

**Growth models address specific questions**

- Different growth analysis techniques are good at answering different questions.
- It is critical to understand these different questions.
- Different questions lead to different conversations which lead to different uses and outcomes.

**Changing conversations about education**

- Starting with the right questions simplifies development and motivating the proper use of the growth model results.
- It's all about the conversations you want to have. The questions set the table for those conversations.

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Guiding Questions

### What are the relevant questions for parents?

Yen (2007), from a state survey of parents, teachers and administrators, compiled a list of frequently voiced questions/concerns by stakeholder group.

**Parent Questions**

- Did my child make a year's worth of progress in a year?
- Is my child growing appropriately toward meeting state standards?
- Is my child growing as much in Math as Reading?
- Did my child grow as much this year as last year?

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### What are the relevant questions for teachers?

Yen (2007), from a state survey of parents, teachers and administrators, compiled a list of frequently voiced questions/concerns by stakeholder group.

**Teacher Questions**

- Did my students make a year's worth of progress in a year?
- Did my students grow appropriately toward meeting state standards?
- How close are my students to becoming Proficient?
- Are there students with unusually low growth who need special attention?

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### What are the relevant questions for administrators?

Yen (2007), from a state survey of parents, teachers and administrators, compiled a list of frequently voiced questions/concerns by stakeholder group.

**Administrator Questions**

- Did the students in our district/school make a year's worth of progress in all content areas?
- Are our students growing appropriately toward meeting state standards?
- Does this school/program show as much growth as that one?
- Can I measure student growth even for students who do not change proficiency categories?
- Can I pool together results from different grades to draw summary conclusions?

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Measuring Student Growth  
Combining Actual and Aspirational Growth  
Growth & Effectiveness

### The Colorado Growth Model

**How much growth did a student make? Is it enough?**

- An important first step in the development of the Colorado Growth Model was to separate the description of growth from discussions of responsibility (i.e., accountability).
- Once stakeholders believed that the description of growth was fair and credible, conversations about whether and how to incorporate growth into accountability followed more easily.
- A viable description of growth facilitates stakeholder engagement and investigations of responsibility for good/bad growth.
- This in turn leads to greater stakeholder support for particular forms of accountability.

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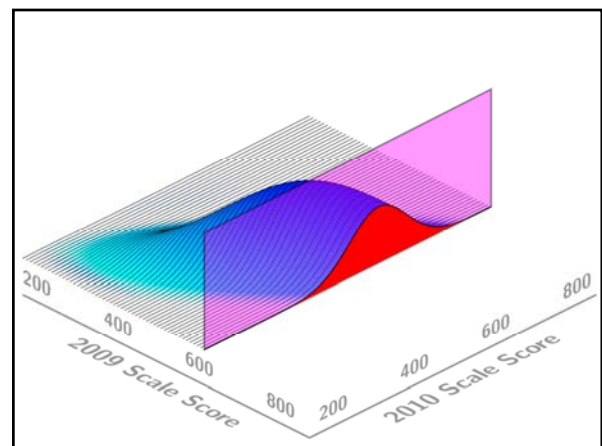
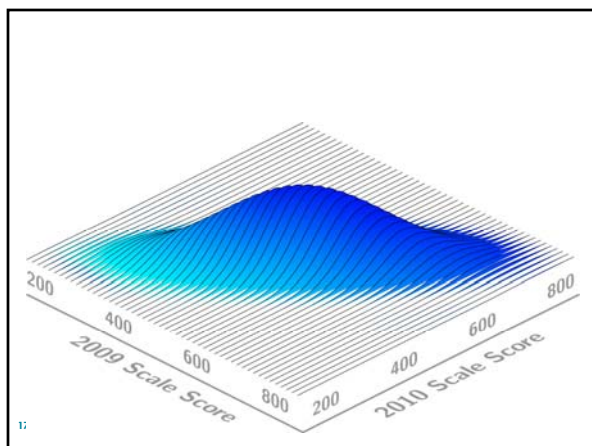
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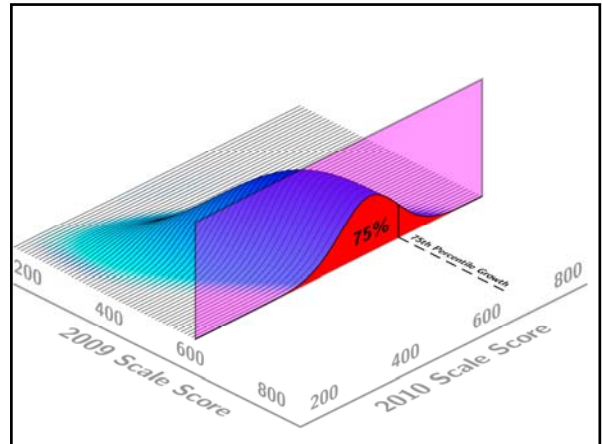
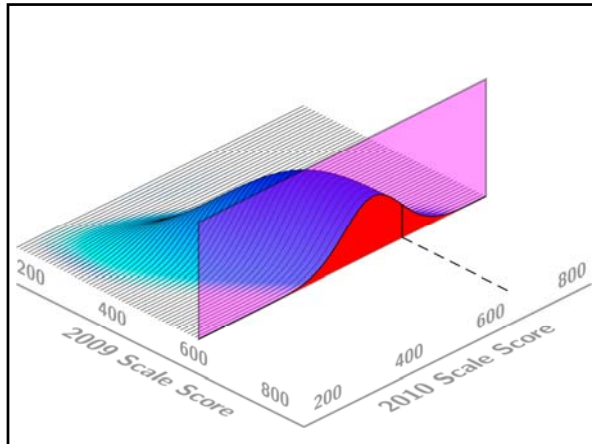
### Describing student growth

- Measuring student growth, even with a vertical scale, is not a simple task.
- Some believe a vertical scale simplifies the task of measuring student growth.
- Even with an interval (or ratio) scale, growth is not easy to interpret. Consider, for example, height.
  - A child might grow 4 inches between ages 3 and 4.
  - 4 inches is a well understood quantity.
  - The 4 inch increase becomes really meaningful only when understood alongside the growth of other 3 to 4 year olds.
- **Student growth percentiles** were developed to provide a normative context for describing student growth.

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### Student Growth Percentiles

Should we be surprised with a child's current achievement given their prior achievement?

- Student growth percentiles answer this question.
- Consider a low achieving student with 90th percentile growth and a high achieving student with 10th percentile growth.
  - The low achieving student grew at a rate exceeding 90 percent of similar students.
  - The high achieving student grew at a rate exceeding just 10 percent of similar students.
  - The low achiever's growth is more *exemplary* (probabilistically) than the high achiever's.
- Judgments about the **adequacy** of student growth require external criteria.

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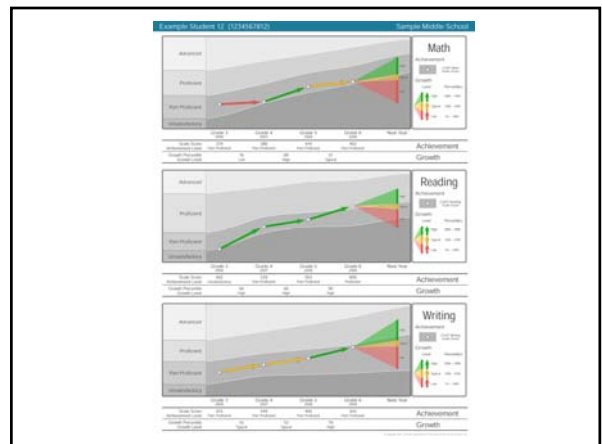
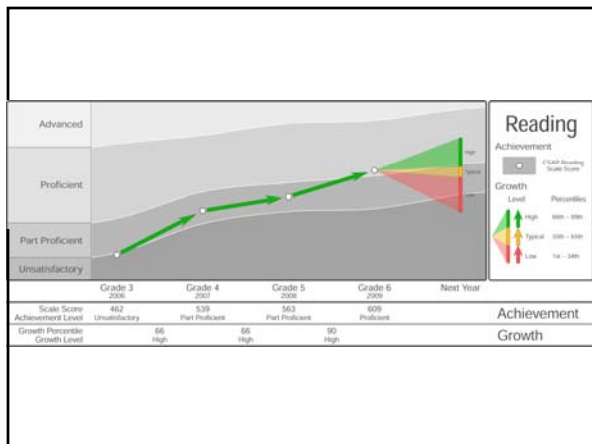
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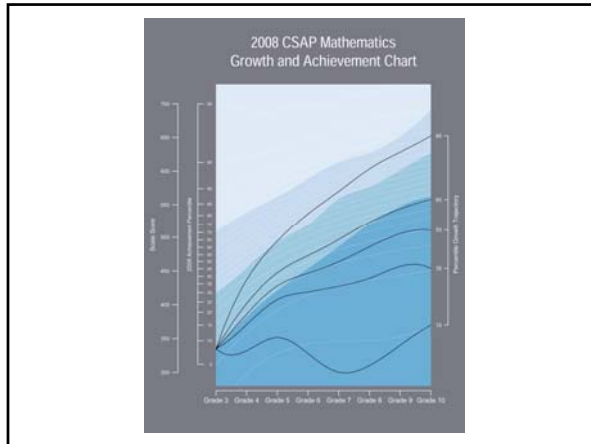
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### Combining norms and standards

- Growth adequacy is determined by whether a student's growth is sufficient to reach/maintain desired achievement levels (e.g., proficiency).
- A next step for the Archdiocese is to consider establishing performance standards (ideally linked to content standards) that can be used to qualify student achievement.
- With established performance standards, percentile growth projections/trajectories are calculated for each student to reach/maintain desired levels of achievement.

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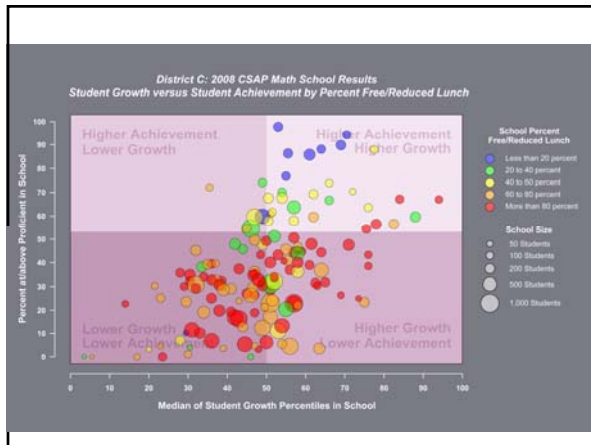
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### Going from students to groups of students

- It's of interest to examine schools where students demonstrate, on average, extraordinarily high and low student growth.
- To summarize the student growth percentiles associated with a school (or other grouping) one calculates the median of the student growth percentiles.
- If students were randomly assigned to schools, one expects to see a median of 50.
- Values greatly above or below 50 are of interest in identifying best practices or providing extra support.
- Examining growth with achievement sheds new light on school performance.

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### Growth, Effectiveness, and Value-Added

**Fundamental Premise**

"Good" schools bring about student growth in excess of that found at "bad" schools.

- "Good schools" are often called highly effective schools.
- What's the relationship between **growth** and **effectiveness**?
- Effectiveness indicates who/what is responsible for the growth (value-added models).
- Yen's questions make no mention of effectiveness placing a greater emphasis on **description**
- This work group's name reflects a more value-added emphasis.

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### Next Steps for growth data

- Calculating growth quantities is the first and easiest step in the development and deployment of a growth model.
- The end goal is to change conversations about education through the examination and use of data.
- To this end, Colorado and other states have been inspired by the Web 2.0 user-centered design philosophies and technologies.
- The goal is to produce data visualization and social networking tools to turn data into information for all education stakeholders and ultimately change conversations about education.

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### Descriptive Accountability

"Accountability system results can have value without making causal inferences about school quality, solely from the results of student achievement measures and demographic characteristics. Treating the results as descriptive information and for identification of schools that require more intensive investigation of organizational and instructional process characteristics are potentially of considerable value. Rather than using the results of the accountability system as the sole determiner of sanctions for schools, they could be used to flag schools that need more intensive investigation to reach sound conclusions about needed improvements or judgments about quality."

R. L. Linn (2008)

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### Descriptive Accountability

"This is the difference between a retrospective question of identifying fault as opposed to a prospective strategy to engineer some corrective measure, almost independent of considering whether there was blame-worthiness. And to move away from the blame-worthiness paradigm toward something that is more regulatory in nature where one might seize upon disparities or circumstances that are for some reason deemed unacceptable and engineer the interventions needed to bring about the necessary change. . . . It's the no-fault gap closing strategy in which the effort is to build a consensus about a vision of an improved society rather than figure out where's the person we want to pillory."

C. Edley (2006)

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### Web 2.0: Data Visualization and Social Networking

- The Colorado Department of Education and the Center for Assessment have been working for the last two years on developing next generation data visualization to accompany growth model data.
- The goal: Transform conversations about education through active engagement with data (i.e., evidence).
- Our efforts have received tremendous interest and recognition:
  - Recognized by Adobe for innovative uses of their technology as an Adobe Max Award finalist in October, 2009.
  - 2010 NCME Award for Outstanding Dissemination of Educational Measurement Concepts to the Public.
  - 14 states signing MOUs to co-develop a cloud-based reporting platform in a non-proprietary fashion.
  - Colorado recently devoted \$2.5 million of stimulus funds to the development efforts

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### The Decade of Data Visualization

**Chart Wars** [http://infosthetics.com/archives/2010/01/chart\\_wars\\_the\\_political\\_power\\_of\\_data\\_visualization.html](http://infosthetics.com/archives/2010/01/chart_wars_the_political_power_of_data_visualization.html)

**Hans Rosling/Gapminder**  
<http://www.youtube.com/watch?v=jbkSRLYSojo>

**Journalism in the Age of Data**  
<http://datajournalism.stanford.edu/>

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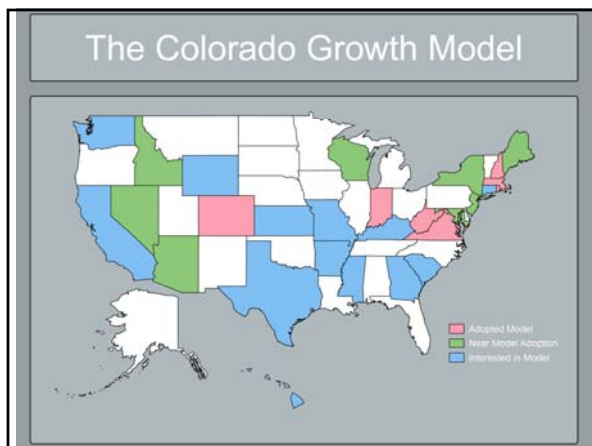
### Web 2.0: Data Visualization and Social Networking

With a collaborative spirit, with a collaborative platform where people can upload data, explore data, compare solutions, discuss the results, build consensus, we can engage passionate people, local communities, media and this will raise—incredibly—the amount of people who can understand what is going on.

And this would have fantastic outcomes: the engagement of people, especially new generations; it would increase knowledge, unlock statistics, improve transparency and accountability of public policies, change culture, increase numeracy, and in the end, improve democracy and welfare.

E. Giovannini, Chief Statistician, OECD. June 2007

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### References


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- 2. Betebenner, D. W. (2009). Norm- and criterion-referenced student growth. *Educational Measurement: Issues and Practice*, 28(4):42–51.
- 3. Edley, C. (2006). Educational "Opportunity" is the highest civil rights priority. So what should researchers and lawyers do about it? Retrieved June 22, 2006 from the World Wide Web: [http://www.softconference.com/ISD1A/00P/269497/#41\\_616](http://www.softconference.com/ISD1A/00P/269497/#41_616).
- 4. Linn, R. L. (2008). Educational accountability systems. In *The Future of Test-Based Educational Accountability*, pages 3–24. Taylor & Francis, New York.
- 5. Yen, W. M. (2007). Vertical scaling and No Child Left Behind. In Dorans, N. J., Pommerich, M., and Holland, P. W., editors, *Linking and Aligning Scores and Scales*, pages 273–283. Springer, New York.

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If you have questions you want me to forward to Dr. Betebenner . . .


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Next PD session . . .

- Interpreting & Using Student Growth Percentiles, Part 2
- Presented by Bob Lee, Chief Analyst, Massachusetts Department of Elementary & Secondary Education
- Wednesday, April 20, 1:00-2:30 PM
- <http://desemo.adobeconnect.com/r32654385/>



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For more information:

[www.dese.mo.gov/MOSIS/MCDS\\_pilot-student-growth.html](http://www.dese.mo.gov/MOSIS/MCDS_pilot-student-growth.html)

