

Perspectives on Teacher Effectiveness using the Colorado Growth Model

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From a Paucity to a Plethora of Data

Data Data Everywhere (The Economist, 2010)

- More and better organized data: *mega, giga, tera, peta, exa, zetta, yotta!*
- Historical records of student achievement.
- Linkage of student achievement to student demographics, teachers, schools, educational programs, . . .
- Stakeholder interest in examining student achievement over time (student growth) derives from data availability..

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.

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.

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.
- The questions set the table for those conversations.
- Yen (2007) for an excellent list of questions derived from a survey of parent, teachers and administrators

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?

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?

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?

Growth & Accountability: The Colorado Growth Model

How much growth & is it enough?

- Colorado begins conversations about education/educator quality by answering two questions:
 - How much growth did a student make?
 - Is it enough growth to reach or maintain proficiency?
- Answering these two questions in a credible and clear manner sets the stage for subsequent accountability discussions.
- Colorado has purposely separated the description (what is) from the determination of responsibility (who/what is responsible).
- This separation has promotes greater ownership of results and participation in finding root causes.

Reading

Achievement

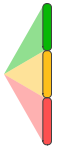


CSAP Reading Scale Score

Growth

Level

Percentiles



High

66th - 99th

Typical

35th - 65th

Low

1st - 34th

Advanced

Proficient

Part Proficient

Unsatisfactory

Grade 3
2006

Grade 4
2007

Grade 5
2008

Grade 6
2009

Next Year

Scale Score
Achievement Level

462
Unsatisfactory

539
Part Proficient

563
Part Proficient

609
Proficient

Achievement

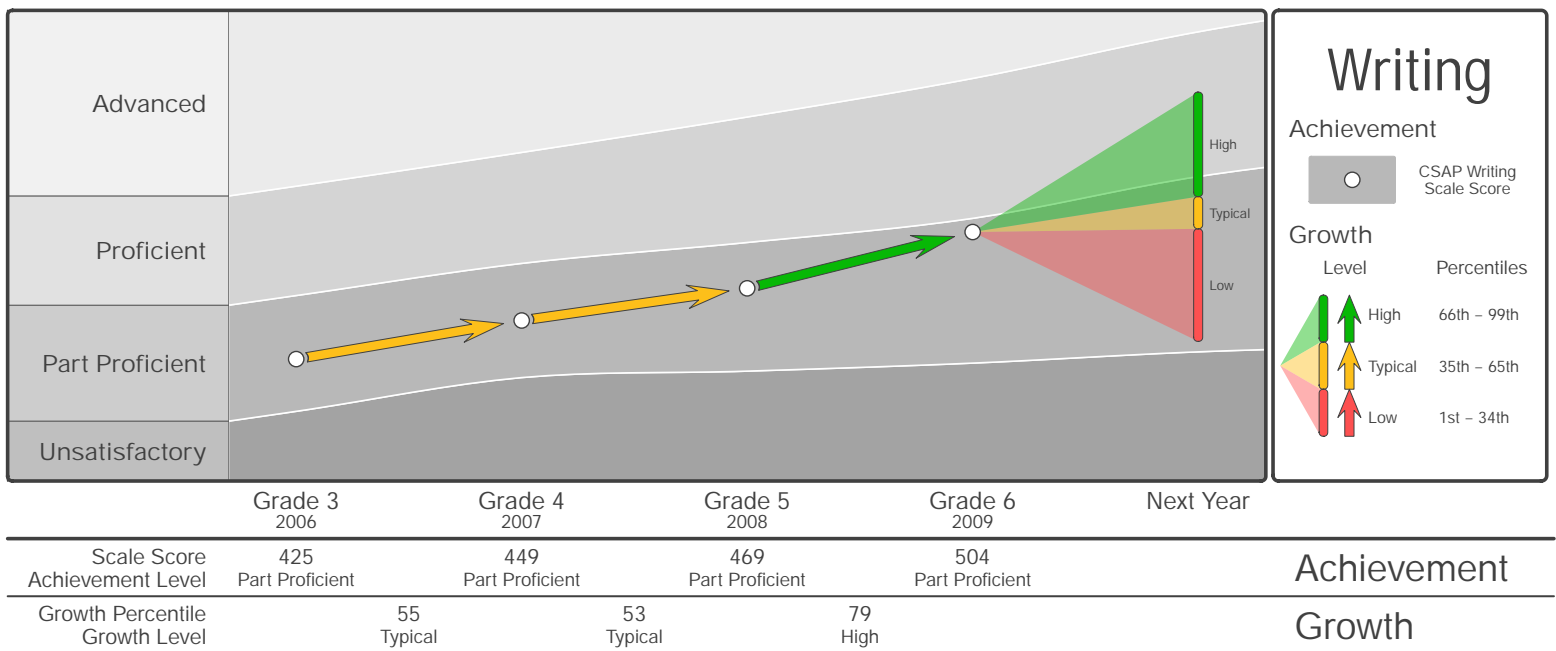
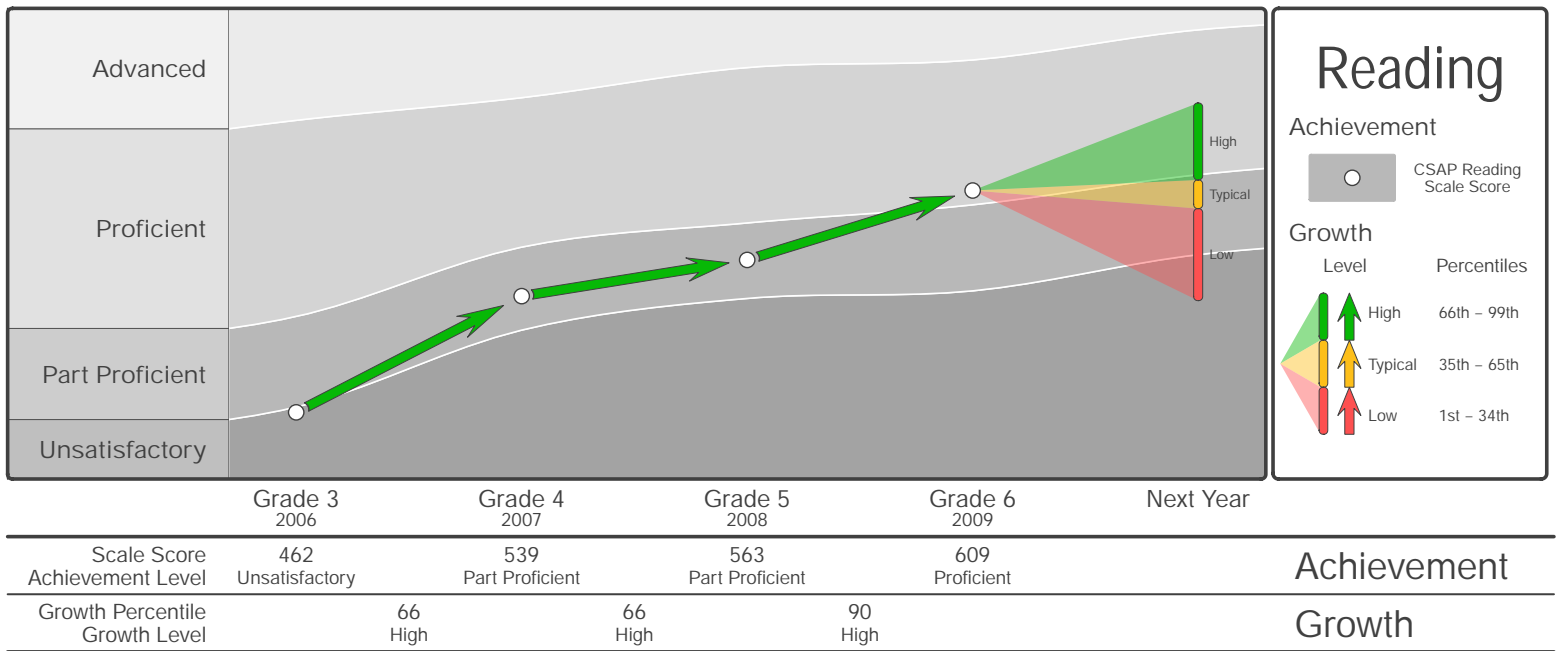
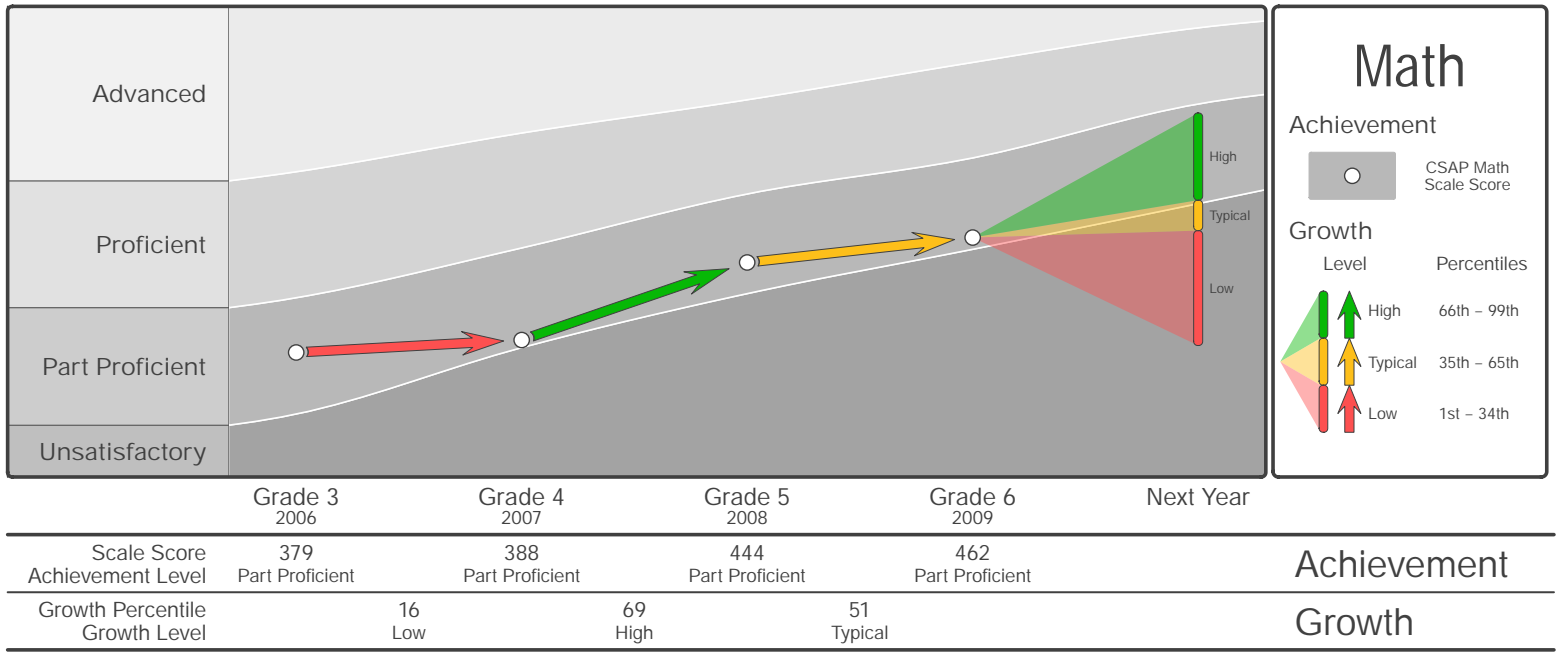
Growth Percentile
Growth Level

66
High

66
High

90
High

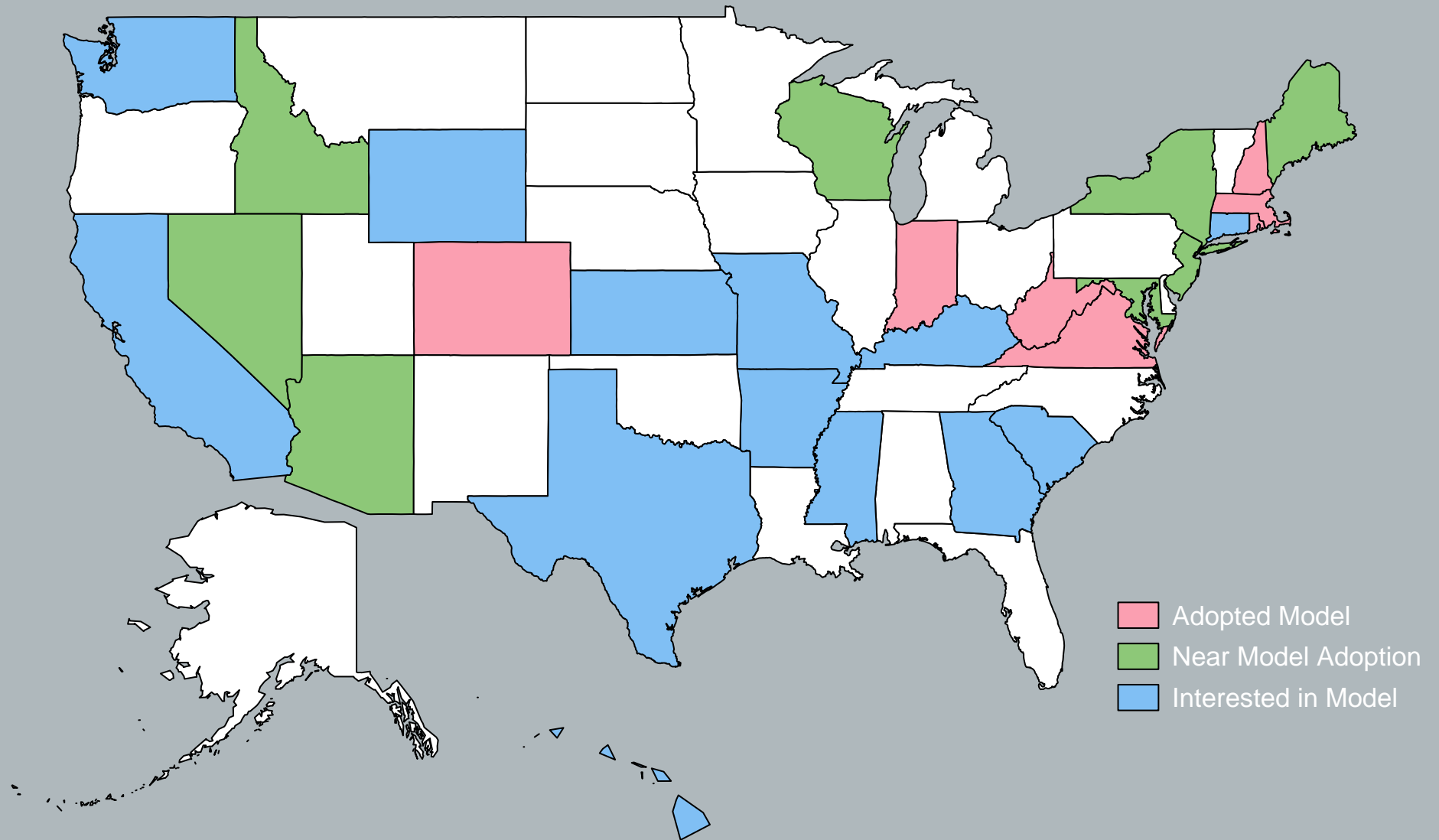
Growth



The Colorado Growth Model

- The Colorado Growth Model is based upon the open source and Student Growth Percentile (SGP) methodology [Betebenner, 2008, Betebenner, 2009]
- The model is a norm and criterion-referenced growth model that allows Colorado to answer *How much?* and *Is it enough?*
- The software used to calculate and visualize SGPs is free (open source).
- Currently over two dozen states are investigating or utilizing the model.

The Colorado Growth Model



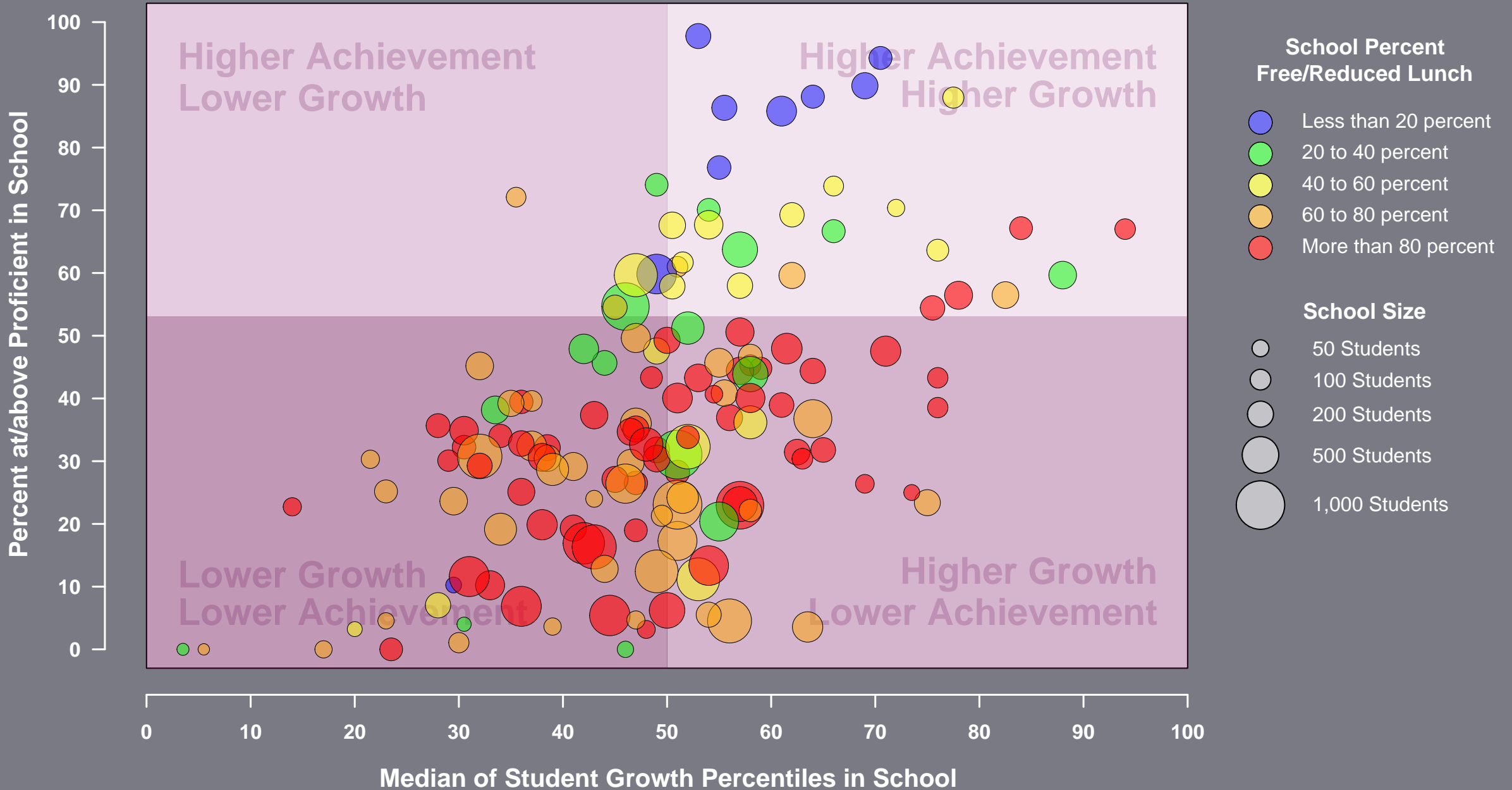
Descriptive Accountability

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 [Linn, 2008, p. 21].

Going from Students to Schools

- It's of interest to examine schools/classrooms where students demonstrate, on average, extraordinarily high and low student growth.
- To summarize the student growth percentiles associated with a school/classroom (or other grouping) Colorado calculates the median of the student growth percentiles.
- If students were randomly assigned to schools, expect 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/classroom performance.

District C: 2008 CSAP Math School Results
Student Growth versus Student Achievement by Percent Free/Reduced Lunch



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.”

Christopher Edley (2006)

Web 2.0: Data Visualization and Social Networking

- The Colorado Department of Education has embraced advanced data visualization as a means of communicating complex data in a manner that is accessible to non-technically inclined audience (e.g., parents).
- The goal: Transform conversations about education through active engagement with data (i.e., evidence).
- Colorado's 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.
 - 15 states signing MOUs to co-develop a cloud-based analysis and data visualization platform in a non-proprietary fashion.
- Work has just begun in to extend Colorado's efforts in multiple states including New Hampshire, Nevada, and Rhode Island with many more to come.







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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