The Rennie Center for Education Research & Policy @MassINC

GAINING GROUND:
VALUE-ADDED ANALYSIS FOR MASSACHUSETTS

Overview

The premise of standards-based reform in Massachusetts is that a statewide commitment to standards, teaching, assessment, and accountability will lead to greater learning opportunities, higher achievement, a narrowing of the achievement gap, and a more promising future for *all* of the Commonwealth's students. And indeed, ten years after the passage of the 1993 Massachusetts Education Reform Act, there is strong evidence—from rising scores on state and national tests to testimony from students and teachers themselves – that Massachusetts schools and students are rising to the challenge provided by rigorous academic standards.

Yet we have hardly begun to tap the wealth of information that the state has gathered on student learning. Federal "No Child Left Behind" legislation requires states to measure all students' progress toward "Proficiency". While Massachusetts has a sophisticated, even complex, state accountability system, the current system does not allow the Commonwealth to follow individual students' academic trajectory toward proficiency *over time*.

Our current accountability system does not enable us to measure individual students' academic achievement over time.

The purpose of this paper is to propose that Massachusetts' accountability plan for schools and districts include a value-added component—a goal that can be realized given key opportunities which now exist. To meet federal NCLB mandates, Massachusetts is required to test all students annually in grades 3 through 8 by 2006—a process in which the Commonwealth has now invested significant time and fiscal resources. With the state's newly developed infrastructure and commitment to annual testing, value-added assessment has become a practical, viable reality in Massachusetts.

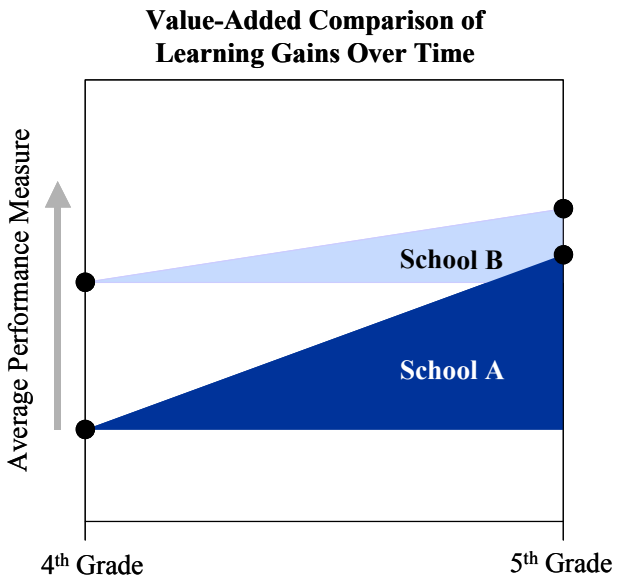
To explore how better use of student achievement data could enhance our current system of accountability and school improvement, the Rennie Center convened a diverse group – representing teachers' unions, parents, school committees, superintendents, principals, and other education experts – with whom we consulted over several months in preparation of this report. The group focused its attention on the measurement, over time, of student learning gains. We believe that such a system will enhance:

- The state's capacity to make fair judgments about school effectiveness;
- Teachers' capacity to provide focused learning support for students;
- Parents' understanding of their children's academic growth in school; and
- Administrators' and local policymakers' decisions about how to improve educational programs.

This paper presents the Rennie Center's conclusions about how and why Massachusetts should supplement its current accountability system with value-added analysis. We do not see value-added analysis as a substitute but rather as a complement that adds breadth and depth.

What is value-added analysis?

Value-added analysis begins by measuring the growth of individual students' performance over time. Looking at this growth allows educators to assess the impact of schools and programs on student learning. This approach, which has already been adopted in other states such as Tennessee and North Carolina, differs from Massachusetts' current accountability system. Our current system compares the performance of a school's current fourth graders (for example) to that of past fourth graders. A value-added system, in contrast, follows how individual fourth graders' performance progresses as they move into fifth, sixth, and seventh grade.



Value-added analysis provides information about how students are progressing. In the example above, School A's 5th grade students are not performing at a high level as School B's 5th grade, but School A's academic growth is greater.

Current school performance ratings in Massachusetts do take into account averages of students' performance at a certain grade-level over more than one year, but they do not take into account gains in student learning as students move from grade to grade. A value-added assessment of one class looks at how much, on average, student performance grows as class members are promoted to higher grades. Such an assessment will give educators information to begin to determine whether students are gaining ground at a yearly rate that will allow more and more of them to reach and maintain proficiency as they progress through school.

What are the advantages of value-added analysis?

Our current system of analyzing school and student progress needs strengthening. We believe that adding value-added analysis to accountability will yield a fairer, fuller picture of school and student gains. This additional analysis of progress will provide two advantages –greater fairness and better information.

First, fairness. Not all students begin the school year with the same academic preparation and knowledge. Some schools face greater challenges than others—especially those in which high numbers of students live in poverty, speak languages other than English at home, are mobile, or have disabilities that affect their learning. While we believe and expect that all students should reach high levels of achievement, we must acknowledge where they begin in order to provide them with the support they will need.

Value-added accountability takes into account where students start and measures their learning gains during the academic year. For example, such a system may identify high poverty or urban schools that are doing an excellent job of nurturing students' academic growth despite the fact that school's absolute scores have not yet reached parity with those schools which are traditionally seen as being higher-performing, high-scoring schools.

Second, information. Over time, as a value-added system follows student progress—recording *changes* in individual student achievement over time—it will allow better diagnosis of student needs, stronger evaluation of programs, and wiser decision-making at the state, district, school, and classroom level. A system that gathers program information and matches it to information about individual student learning gains over time will address such questions as:

- Which student competencies at one grade level are most predictive of academic success in later years?

- Which programs lead to great gains for elementary students who began with very weak math skills?
- Which instructional practices seem to be the most effective for students with special needs?
- Which programs sustain and increase the performance level of middle school students with advanced achievement in language arts?

Value-added analysis enables better diagnosis of student needs, stronger evaluation of programs, and wiser decision-making at the state, district, school, and classroom level.

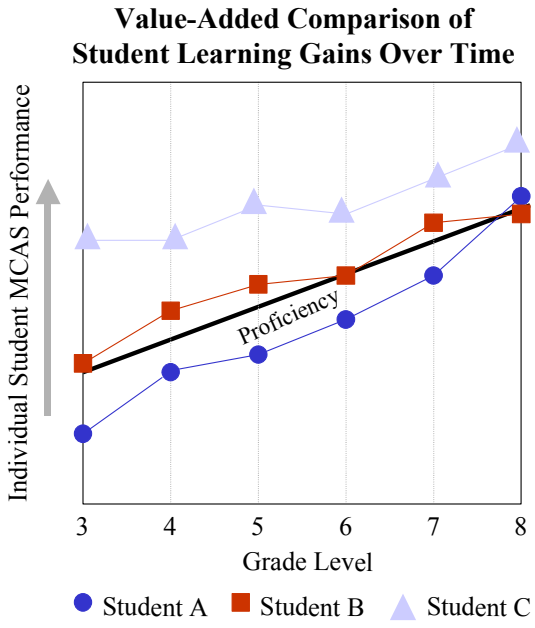
With value-added analysis, we will be gathering more information about student growth trajectories—how students progress from year to year—as well as warning signs about students' potential future academic difficulties. Equipped with this knowledge, we can begin to attribute differential gains in student learning to different educational strategies. A value-added system also will improve educational practice by informing:

- Targeted individual remediation;
- Data-based decision-making;
- Strategic planning at the school, district, and state level;
- Professional development of teachers, principals, and superintendents;
- Local policymakers' decisions regarding budgeting, policy, and collective bargaining;
- Research on statewide issues;
- Curricular programming and evaluation; and
- Administrators' instructional leadership.

Finally, and perhaps most importantly, a value-added system will keep parents informed about their children's learning progress.

What key features should characterize value-added accountability in Massachusetts?

In the near term, value-added analysis in Massachusetts should be founded on student MCAS scores and designed to measure student progress toward proficiency. Despite its limitations, MCAS currently offers Massachusetts educators the best comparable measure of student progress. Over time, for diagnostic purposes, school districts can and should integrate other sources of student achievement data into their value-added analysis.



Key Principles Behind Value-Added Assessment

- *MCAS must be vertically aligned from year-to-year so that we can chart progress across time along one scale.*
- *A value-added assessment must use multiple data points that are gathered over several years to make judgments about progress more reliable.*
- *A value-added assessment system provides parents, educators, and decision-makers with academic growth trajectories over time for individuals and groups of students.*

Encompassing all students in value-added analysis

Value-added systems in some states exclude special education students from their analysis. It is important that value-added analysis and accountability in Massachusetts encompass *all* students, including students with special educational needs or limited English proficiency. In the case of special needs students, some will continue to qualify for alternative, non-MCAS, assessment, but these students' progress can, and should, be followed with alternative means. In the case of English Language Learners, a value-added system will enable better assessment of their progress both while and after they achieve competency in English. In general, value-added analysis offers an equitable and effective way of monitoring these students' progress toward high standards and investigating which programming leads to greatest gains.

Linking length of student enrollment and accountability

A value-added system should hold schools and districts accountable only for the achievement of students whom they have served for a reasonable length of time. High student mobility rates or periods of prolonged absence can interfere with a school's ability to impart instruction. The current accountability system in Massachusetts holds schools responsible only for those students that have been enrolled as of October 1. Similarly, under a value-added accountability system, school and district performance should be evaluated on the performance of students who have been continually enrolled for a minimum length of time, perhaps 85% of the school year leading up to the testing date.

Improving teacher effectiveness with value-added analysis

Teachers differ in their effectiveness at teaching certain students or certain subjects. If, by looking at classroom-level data, schools and districts can begin to attribute student academic growth to different teaching practices, this information can be used to identify and spread effective practices and to guide professional development. Teacher teams can look at grade-by-grade growth data in forming plans for how to serve all students more effectively.

Value-added assessment provides additional data and information that enable the development of a fuller, fairer view of teacher performance. At the same time, use of value-added analysis for the evaluation of individual teachers is problematic. First of all, research conducted on the experience of other states using value-added assessment suggests that no conclusions about teacher effectiveness in producing student growth should be based on less than three years of data. Additionally, because significant amounts of learning occur outside the classroom in the home or community, student growth cannot be attributed solely to teachers' input. Value-added assessment should not be used as the basis for teacher hiring or firing because there is always some unavoidable error in the calculation of student scores and student growth. Instead, the emphasis in local districts should be on using value-added analysis to inform professional development and school improvement planning.

Encouraging value-added analysis at the school and district level

Finally, it is important to recognize that state-level value-added analysis only begins to address the need for better use of data to improve educational programming. The most important decisions and interventions are made at the school and classroom level. School and district leaders need to continue to develop their own instruments, ask their own data questions, and perform their own longitudinal analyses. Schools and districts that are leaders in the use of data have found that frequent common assessment of student progress (perhaps quarterly, or more often for key skills such as early reading), followed by team-based review and instructional response, can be an effective means of accelerating student learning. Such work will be particularly important as we strive to close the racial and economic achievement gap. Training and encouragement are also needed to help teacher teams look at and analyze student work and student data in a way that leads to continually better instruction. Realizing these goals will require an investment in outreach, training, and technical assistance.

What is required for value-added analysis?

A full value-added accountability system requires a number of data and data-management elements, some of which Massachusetts has already, some of which can be developed rather quickly, and some of which will take considerable time and investment. The following elements will be required for the inauguration of a value-added system.

Elements Currently in Place

- **Individual student identifiers.** State-assigned student identification numbers (SASIDs) are already in use. As is currently the case, student (and teacher) identifiers must have appropriate safeguards to ensure that records are secure and shared only with people who have a legitimate need to see them.

- **Annual gathering of student demographic information.** The state already gathers and stores extensive data on student demographics and program enrollment. Over 40 demographic and program variables are linked to students through their SASID. For example, these variables include race, gender, free lunch status, and enrollment status in programs for special education, English immersion, and vocational education.

Elements Still to Be Completed

- **Creation of a coordinated and linked data management system.** A coordinated and linked data management system must be created that is suitable for the long-term storage, collation, and analysis of longitudinal data on student achievement. Such a system must allow compilation of data from multiple sources and relational querying by authorized users. While rich data stores currently exist at the state level, data elements are often held in unconnected files that raise barriers to effective querying and analysis. Improvement of the system will require upgrades and higher staffing levels.

- **Annual grade-by-grade testing with vertically-aligned tests.** Annual, grade-by-grade testing must be conducted with vertically-aligned, anchored assessments—that is, tests that measure foundation knowledge of the same subject matter over time, so that student growth can be fairly measured. Annual tests in grades 3-8 are planned for spring 2006. Value-added analysis at the high school may be more difficult because of technical problems in aligning tests for different knowledge domains within a discipline (e.g., chemistry vs. biology, or algebra vs. geometry).

The next four requirements are important in the longer term – providing additional, very helpful information that could dramatically enhance policy initiatives and school improvement.

- **Capacity for local school districts to enter their own data elements.** Local school districts must have the capacity to enter their own data into a linked storage system. This data could include a district's own longitudinal data on student achievement (such as baseline screening measures on school entry, measures of early reading achievement, local assessments on non-tested grades, information on high school course completion, or scores on other achievement-based tests such as the SAT II or Advanced Placement tests). In addition schools could enter information on student program participation, such as participation in tutoring, pullout programs, or trials of new curriculum. With such data, districts will be able to correlate student progress on MCAS with programming decisions made at the local level.

- **Enhanced data auditing function.** Enhanced data monitoring will enable the state to double-check the quality of data provided by schools.

- **Linkages to post-secondary data.** We must connect student-learning data to post-secondary information about student enrollment and performance in college, need for remediation, and graduation rates from state colleges and universities.

- **Systematic appraisal of statistical system development.** We must conduct a systematic appraisal of the statistical systems required for the responsible analysis of value-added data and the gradual implementation of those systems at the state and local level.

Conclusions and Next Steps

Moving to a statewide system of value-added analysis will require time and investment. Besides upgrades to hardware and software, these changes in the use of data will require significant increases in staffing. The Department of Education will need to expand both its internal capacity to manage and analyze large volumes of data, as well as its district-level presence by hiring field staff or contracting third-party partners with expertise in providing technical assistance to local districts and assisting educators in the field.

While many districts are already engaged in the hard work of instructional planning based on data analysis, a major cultural shift will be required in other districts to enable them to use data well, including hiring staff dedicated to value-added analysis and related programmatic evaluation. Expanding the use of student data analysis at the community, district, school, and classroom level will require significant support and technical assistance. To meet these needs, the Department of Education may need to call on community, business, and university partners to assist its own and district level staff in providing training and assistance to administrators, school board members, teachers, and teacher educators. Indeed, there are already some promising independent data analysis initiatives underway, such as the Massachusetts Business Alliance for Education's "Just for the Kids" project.

We acknowledge that value-added assessment is a developing tool with technical complexities. To ensure effective implementation of this system, we recommend the appointment of an expert technical panel to periodically assess design features. Such an expert panel should consider various factors that may impact student achievement, such as summer learning loss, mobility, and any anomalies pertaining to special education and limited English proficient students.

Value-added analysis is, in the end, an equity strategy. It will provide educators with the information necessary to take education action steps at critical junctures during a child's education.

Value-added analysis cannot immediately solve all the challenges faced by any accountability system. But over time, such analysis provides both a fuller picture of learning progress and the richly textured local information needed to inform continued diagnostic review and education reform. Value-added analysis will provide more and better information to researchers, educators, and the public. And the greatest improvement in student performance will come when educators supplement this analysis with formative assessment and thoughtful use of student data at the school and classroom level. As a national leader in education reform, Massachusetts should not pass up the opportunity offered by this additional analytical tool. Investment in value-added analysis will enhance the Commonwealth's accountability system and provide it with new strategies for accelerating progress under education reform.

If public education is to continue to improve its capacity to teach all children effectively, educators must be able to track a students' learning gains over time.

Standards-based reform has successfully focused the Commonwealth's attention on providing *all* students with the opportunity to learn and ensuring that *all* students achieve high academic standards. However, if public education is to continue to improve its capacity to teach all children effectively, educators must be able to track a students' learning gains over time and be able to identify which programmatic efforts and educational strategies are working. Value-added analysis is, in the end, an equity strategy. It will provide educators with the information necessary to take education action steps at critical junctures during a child's education. Knowledge gained through this powerful analytical tool will thereby enable the Commonwealth to take vital steps toward eliminating the achievement gap.

Endorsements

The following organizations have endorsed this document:

Boston Plan for Excellence
Massachusetts Association of School Committees
Massachusetts Association of School Superintendents
Massachusetts Business Alliance for Education

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The Rennie Center's mission is to develop a public agenda that informs and promotes significant improvement of public education in Massachusetts. Our work is motivated by a vision of an education system that creates the opportunity to educate every child to be successful in life, citizenship, employment and life-long learning. Applying nonpartisan, independent research, journalism and civic engagement, the Center is creating a civil space to foster thoughtful public discourse to inform and shape effective policy.

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