Municipal Benchmarks for Massachusetts Middle Cities

A Look at Educational Achievement

No. 57
April
2010

A Pioneer Institute White Paper

by Dr. Robert D. Gaudet

PIONEER INSTITUTE
PUBLIC POLICY RESEARCH

Pioneer's Mission

Founded in 1988, Pioneer Institute is a non-partisan public policy think tank committed to keeping Massachusetts economically competitive and to strengthening the core values of an open society. To inspire market-driven policy reforms, Pioneer promotes individual freedom and responsibility and limited, accountable government. The Institute has changed the intellectual climate in Massachusetts by commissioning timely and rigorous academic studies from leading scholars. Pioneer injects new ideas into the public debate through forums and lectures, transcripts, the media, and outreach to legislators, business groups and the general public.

Pioneer's Centers

This paper is a publication of the Middle Cities Initiative, which advances data-driven management in the Commonwealth's 14 older industrial cities. Pioneer works with mayors and community leaders to disseminate data on municipal performance, and studies concrete actions cities can take to improve core services.

The Center for Economic Opportunity, which seeks to keep Massachusetts competitive by promoting a healthy business climate, transparent regulation, small business creation in urban areas and sound environmental and development policy. Current initiatives promote market reforms to *increase the supply of affordable housing, reduce the cost of doing business, and revitalize urban areas.*

The Center for School Reform seeks to increase the education options available to parents and students, drive system-wide reform, and ensure accountability in public education. The Center's work builds on Pioneer's legacy as a recognized leader in the charter public school movement, and as a champion of greater academic rigor in Massachusetts' elementary and secondary schools. Current initiatives promote *choice and competition, school-based management, and enhanced academic performance in public schools.*

The Shamie Center for Better Government seeks limited, accountable government by promoting competitive delivery of public services, elimination of unnecessary regulation, and a focus on core government functions. Current initiatives promote *reform of how the state builds, manages, repairs and finances its transportation assets as well as public employee benefit reform.*

Pioneer Institute is a tax-exempt 501(c)3 organization funded through the donations of individuals, foundations and businesses committed to the principles Pioneer espouses. To ensure its independence, Pioneer does not accept government grants.

Municipal Benchmarks for Massachusetts Middle Cities

A Look at Educational Achievement

Dr. Robert D. Gaudet

Contents

Overview

This analysis evaluates the educational performance of the 14 school systems that comprise the Pioneer Institute's Middle Cities Initiative.[1] These communities, which are outside of the Boston metropolitan area, struggle to attract businesses, maintain a viable tax base, control crime, and educate their children to the level needed to succeed in today's world.

The first phase of the research examines the Grade 10 MCAS CPI Composite Performance Index, a measure of overall student achievement) and dropout rate characteristics of the 14 Middle Cities. It identifies among the group:

1. Districts that over time post stronger MCAS score gains than other Middle Cities districts.
2. Districts that are performing at higher levels than similar districts in the Middle Cities study group. Determining exemplary performance is based on analyzing district scores as predicted by the percentage of students eligible for Free Lunch.
3. Districts that have been more successful in reducing the dropout rate than their Middle Cities peers.

A secondary analysis focuses on the relationship, if any, between dropout characteristics and MCAS achievement. Is better MCAS performance associated with relatively high or relatively low dropout rates? Do changes in the dropout rate over time have any connection to changes in MCAS performance?

This study is limited to identifying which Middle City districts stand out in terms of improving MCAS scores or reducing the dropout rate. The research is not designed to identify the reasons why a certain district outperforms other districts. The work only considers achievement and dropout data in the analysis; it does not utilize any qualitative data about curriculum and instruction in the Middle Cities districts.

Metrics

The study utilizes two outcome indicators (MCAS scores and dropout rates) and one demographic characteristic (percentage of students eligible for Free Lunch in the district).

- MCAS scores are utilized because they are the only measure available for statewide and local student achievement.
- Dropout rates are increasingly seen as a measure of how well a district is educating its students. Districts with lower dropout rates may be implementing practices and policies that keep students interested in staying in school.
- Free Lunch percentage reflects family poverty. Under federal guidelines, children whose families have income of 130% or less of the Federal poverty guideline as well as those who receive food stamps or Temporary Assistance for Needy Families (TANF) are eligible for free lunch. The percentage of students eligible for Free Lunch in a district correlates highly (.926) with the percentage of families in poverty in Massachusetts districts. The percentage of students eligible for Free Lunch also correlates highly with MCAS scores. For 2008 grade 4 MCAS, the correlation between Free Lunch and the percentage Advanced or Proficient is –.739 for ELA and –.654 for math. For grade 10 MCAS, the correlation is –.859 for ELA and –.853 for math.

Grade 10 ELA and math MCAS scores are examined in terms of two metrics:

- Increase over time (2004 to 2008 for the Middle Cities).
- Over-performance relative to percentage of Free Lunch students (2008 MCAS).

Dropout rates are examined in terms of two metrics:

- Average dropout rate over time (2003-04 to 2007-08).

- Reduction in dropout rate over time (2003-04 to 2007-08).

Characteristics of the Middle Cities

The 14 communities in the Pioneer Institute's Middle Cities initiative serve very diverse student populations ranging in size from 25,233 (Springfield) to 5,331 (Fitchburg). The percentage of students eligible for Free Lunch ranges from 73.5% in Lawrence to 26.3% in Leominster. (All student characteristics data are 2007-08.)

As is the case in most urbanized areas, these cities struggle to provide effective education to their students.

- MCAS performance of students in the 14 cities is lower than that of the statewide figures. On the 2008 Grade 10 MCAS, the average CPI for students in the Middle Cities was 81.4 in ELA and 74.6 in math compared to 90.3 and 86.7 statewide.
- These cities are heavily dependent on state education aid, with 44% of state Chapter 70 school aid going to the Middle Cities that have only 18% of the state's population.[2]
- These districts have higher dropout rates than state average – 7.5% in the Middle Cities in 2007-08 compared to a statewide figure of 3.4%, with Holyoke, Fall River and Lawrence having double-digit rates.

Despite the challenges faced by the Middle Cities, some school systems do better at educating their children than others. Identifying systems that perform at higher levels than expected on MCAS, or that do an exemplary job at reducing dropout rates, is the first step to identifying local policies and practices that improve the schools. All of the Middle Cities communities face obstacles in trying to provide quality education to their students. Do some districts demonstrate stronger MCAS performance than others?

Student Characteristics

As a group, students in the Middle Cities project a different demographic profile than do students across the commonwealth. Many more students in the Middle Cities are eligible for Free Lunch than is the case statewide, 56.5% compared to 24% statewide.[3]

Table 1: Middle Cities Student Characteristics 2007-08

	Total Students	Free Lunch %
Brockton	15,338	57.6
Chicopee	7,754	40.8
Fall River	10,108	56.1
Fitchburg	5,331	48.4
Holyoke	6,121	70.9
Lawrence	12,301	73.5
Leominster	6,287	26.3
Lowell	13,505	52.9
Lynn	13,481	63.8
New Bedford	12,988	55.4
Pittsfield	6,234	33.6
Springfield	25,233	70.8
Taunton	7,998	30.1
Worcester	22,876	56.9
Middle Cities Average	**11,825**	**56.5**
State Average (2007-08)		**24.0**

Source: Massachusetts Department of Elementary and Secondary Education

MCAS Performance

MCAS scores in the Middle Cities are generally lower than state average. On the Grade 10 2008 ELA MCAS, Taunton had the highest (83.1) CPI in the group, with Lawrence posting the lowest (63.0). On the Grade 10 math assessment, Leominster had the highest CPI score (80.5) with Lawrence having the lowest (53.0). As is the case statewide, scores in the Middle Cities track demography to a remarkable extent. The highest-scoring communities tend to have lower percentages of students eligible for Free Lunch while the lower-scoring districts have high percentages of Free Lunch students in their classrooms.[4]

Table 2: Middle Cities Grade 10 ELA CPI Score Change Over Time Sorted High to Low

	2004 GR 10 ELA	2006 GR 10 ELA	2008 GR 10 ELA	ELA Average 2004-08	ELA Change 2004-08
Holyoke	61.0	71.1	75.9	69.3	14.9
Worcester	68.6	75.3	82.6	75.5	14.0
Taunton	76.6	83.8	88.8	83.1	12.2
Lynn	70.7	77.2	82.7	76.9	12.0
Springfield	65.6	67.3	77.5	70.1	11.9
Lawrence	58.3	61.4	69.2	63.0	10.9
Chicopee	71.7	77.5	82.3	77.2	10.6
Fitchburg	75.3	75.2	85.7	78.7	10.4
Brockton	78.1	84.0	88.0	83.4	9.9
Middle Cities Average	**71.6**	**75.6**	**81.4**	**76.2**	**9.9**
New Bedford	69.1	74.3	78.2	73.9	9.1
Fall River	71.7	72.6	79.2	74.5	7.5
Lowell	74.2	76.4	81.4	77.3	7.2
State Average	**83.2**	**86.8**	**90.3**	**86.8**	**7.1**
Leominster	79.7	82.9	85.0	82.5	5.3
Pittsfield	81.2	79.1	83.6	81.3	2.4

Source: Massachusetts Department of Elementary and Secondary Education

Table 3: Middle Cities Grade 10 Math CPI Score Change Over Time Sorted High to Low

	2004 GR 10 Math	2006 GR 10 Math	2008 GR 10 Math	Math Average 2004-08	Math Change 2004-08
Worcester	60.4	67.2	75.3	67.6	14.9
Lynn	64.5	73.0	79.2	72.2	14.7
Fitchburg	70.4	71.4	83.2	75.0	12.8
Holyoke	54.2	63.8	66.8	61.6	12.6
Brockton	65.2	72.0	76.4	71.2	11.2
Fall River	60.3	59.9	71.1	63.8	10.8
Taunton	73.4	80.6	84.1	79.4	10.7
Springfield	56.0	58.7	66.6	60.4	10.6
Middle Cities Average	**64.2**	**68.4**	**75.4**	**69.1**	**10.4**
Chicopee	63.1	66.3	72.8	67.4	9.7
Leominster	75.2	81.8	84.6	80.5	9.4
State Average	**78.6**	**83.2**	**86.7**	**82.8**	**8.1**
Lowell	67.7	73.2	75.7	72.2	8.0
Pittsfield	73.0	74.4	80.0	75.8	7.0
Lawrence	51.4	49.4	58.2	53.0	6.8
New Bedford	64.5	66.2	70.8	67.2	6.3

Source: Massachusetts Department of Elementary and Secondary Education

Analysis and Methodology

The basic questions this research is designed to answer are:

- Which Middle Cities districts posted the greatest gains over time in MCAS CPI scores? (The Composite Performance Index is an overall measure of achievement on MCAS.)
- Are there any districts in the Middle Cities that over-performed on MCAS based on their poverty characteristics?
- Which districts did the best job of reducing the dropout rate?
- Is there a relationship between reducing the dropout rate and improving MCAS scores?

The first step in the study was to construct a database of the 14 Middle Cities The data sets include poverty (Free Lunch percentage) and total number of students. Outcome indicators were MCAS scores over time (2004 to 2008 for the 14 cities) and, for the Middle Cities, dropout rates (2003-04 to 2007-08). Average MCAS scores over time and average dropout rates were calculated from the data, as were changes in MCAS performance and dropout percentages over time.[5]

ELA and Math CPI Gain Over Time

The first task was to identify Middle Cities that posted the highest ELA and/or math score gains between 2004 and 2008. In order to make the cut, a district's CPI improvement must be at least one standard deviation above the average gain of the 14 cities.

• While five districts posted solid gains in ELA, two led the field in CPI improvement. Holyoke posted a 14.9-point improvement between 2004 and 2008 in CPI and Worcester's CPI increased 14 points. Other cities showing solid gains were Springfield (11.9 points); Lynn (12.0 points); and Taunton (12.2 points).

• In math, four districts showed strong improvement with the best being Worcester (14.9-point improvement), with Lynn close behind with a 14.7 gain. Fitchburg with a 12.8-point gain and Holyoke with a12.6-point gain rounded out the field.

Aggregate CPI Improvement

Another way to identify positive performance trends is to calculate the total improvement in CPI in both ELA and math over time. The following chart shows the points gained in combined ELA and math CPI between 2004 and 2008 on the Grade 10 MCAS with the strongest performers on the right side of the chart.

The strongest performers in terms of total improvement were Worcester, Holyoke, Lynn, Fitchburg, Taunton, and Springfield.

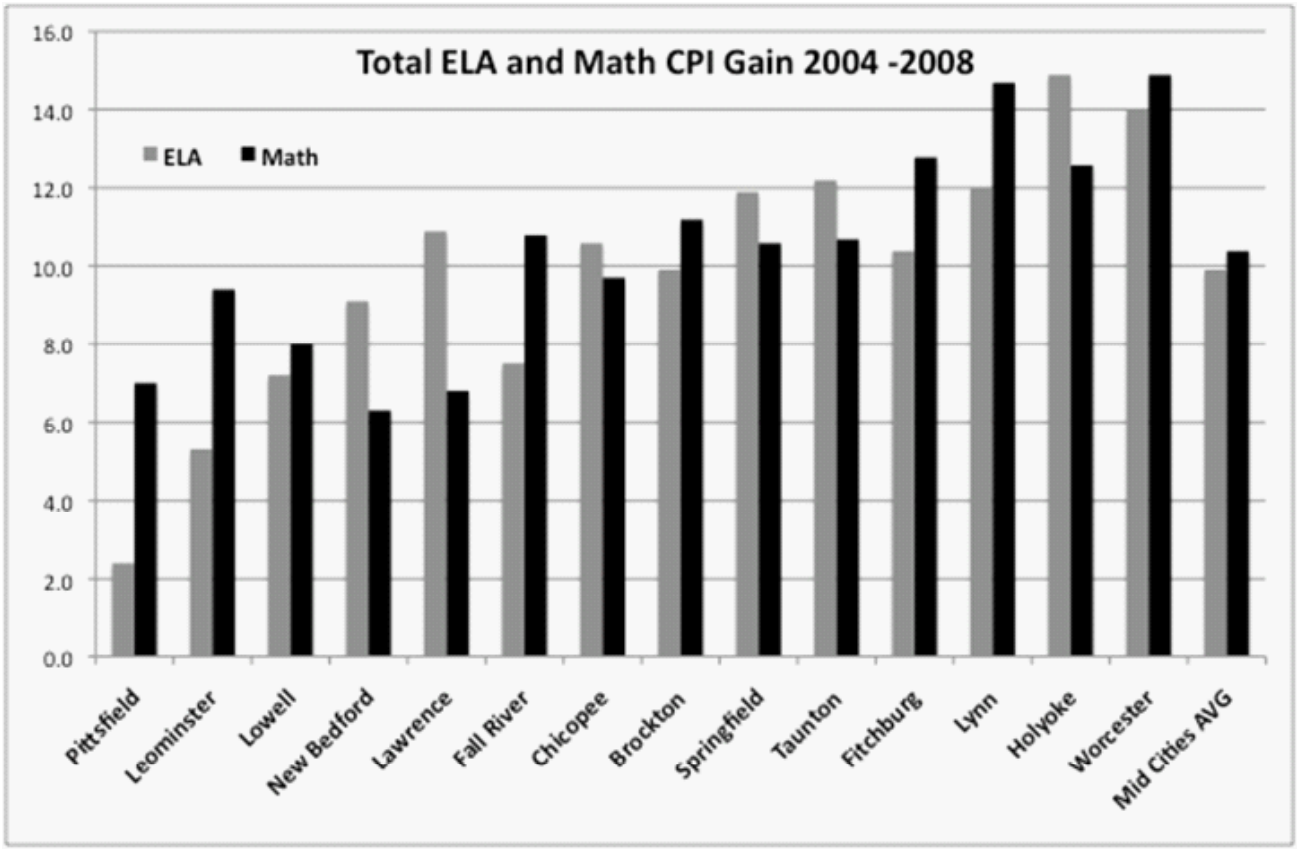
Poverty and Achievement: Overcoming the Odds

A major consideration in any research on educational achievement is the role that poverty plays in student performance. While each of the Middle Cities has a higher percentage of students receiving Free Lunch than the statewide average of 24%, there is wide variation in the percentage of students eligible for Free Lunch (73.5% in Lawrence to 26.3% in Leominster with a sample average of 56.5%).

Free Lunch is highly correlated with poverty and with MCAS performance. The percentage of students eligible for Free Lunch in a district correlates highly (.926) with the percentage of families in poverty in Massachusetts' districts.

The correlation between the percentage of students eligible for Free Lunch and MCAS ELA scores on the 2008 Grade 10 MCAS is –.86 statewide and –.71 for the 14 districts of the Middle Cities. For math MCAS scores, the correlation is –.86 statewide and –.79 for the Middle Cities. This means that as the percentage of Free Lunch students increases, MCAS scores

Chart 1: Total ELA and Math CPI Gain 2004 – 2008



tend to decrease. Thus, it is important to factor in the role of poverty when identifying districts of interest.

This is done by using regression analysis to predict the MCAS scores that a district should post based on the percentage of students who are eligible for Free Lunch. Essentially, the methodology examines each district in the state in terms of its percentage of Free Lunch students and its 2008 MCAS scores compared to every other district. This is the statistical basis for predicting the expected score that a district with a specific percentage of Free Lunch students should achieve. The predicted score can be compared to the actual score received. Some districts score higher than predicted while others score lower. Districts that over-perform the prediction may be doing better in meeting the educational needs of their students than are districts that do not achieve the predicted score.

The following data were developed by running the percentage of students eligible for Free Lunch using 2008 Grade 10 ELA and math scores statewide, including those of the 14 Middle Cities districts. The results yield a predicted CPI score that is compared to the actual score achieved by the district. Districts that score higher than the score predicted by their percentage of Free Lunch students can be said to be performing at higher levels than districts with similar percentages of Free Lunch students. Districts in the chart scored at least two points higher than the predicted score.[6]

It is interesting that three districts performed better in both ELA and math (Brockton, Fitchburg and Lynn). This may indicate that educators in these districts are utilizing policies and practices that are meeting the needs of their students.[7]

Reducing the Dropout Rate

Dropout rates are higher in the Middle Cities than in Massachusetts generally with Holyoke, Fall

Table 4: Districts that Over-Performed in ELA

	2008 ELA CPI	Predicted ELA CPI	Residual*
Brockton	88.0	80.6	7.4
Lynn	82.7	77.9	4.8
Fitchburg	85.7	82.7	3.0
Worcester	82.6	80.3	2.3

Better

Table 5: Districts that Over-Performed in Math

	2008 Math CPI	Predicted Math CPI	Residual*
Lynn	79.2	70.8	8.4
Fitchburg	83.2	77.0	6.2
Brockton	76.4	74.3	2.1

Better

*Difference between actual and predicted score. Higher is better.

River and Lawrence having the highest average dropout rates over the past five years and Lowell having the lowest. Students in the Middle Cities are about twice as likely to leave school before graduating than students statewide. While most Middle Cities districts did reduce the dropout rate between 2003-04 and 2007-08, some districts posted greater reductions than others.

Eight of the 14 Middle Cities reduced the dropout rate between 2003-04 and 2007-08, with Pittsfield clearly posting the greatest improvement, moving from 8.0% in 2003-04 to 4.6% in 2007-08 for a 3.4% reduction. Other districts posting gains greater than one standard deviation above average gain were Taunton (2.0% reduction); Lowell (2.1%) and Leominster (2.2% reduction).

Dropout Rates and MCAS Achievement

There does not appear to be a strong relationship between changes in the dropout rate and changes in MCAS scores in the Middle Cities. The overall correlation in the districts between reducing the dropout rate and increasing total MCAS CPI scores is .41. The district exhibiting the strongest reduction in dropout rate (Pittsfield, which reduced its dropout rate from 8.0% to 4.6% over 5 years) had a relatively modest increase in MCAS scores over that period. Only one of the 4 districts identified for reduction of the dropout rate, Taunton, also was identified as having strong improvement in MCAS scores (increasing ELA CPI by 12.2 points between 2004 and 2008). It is beyond the scope of this work to do a nuanced evaluation of the relationship between dropout rates and achievement, but there are no obvious links between the two as identified in this research.

Other research on the connection between dropout rates and student achievement has not produced definitive conclusions as to the relationship between MCAS achievement and dropping out of school. A 2009 WBUR radio report found that "Since 2003, when the MCAS was made a requirement for graduation, the statewide dropout

Chart 2: Change in Dropout Rate Over Time

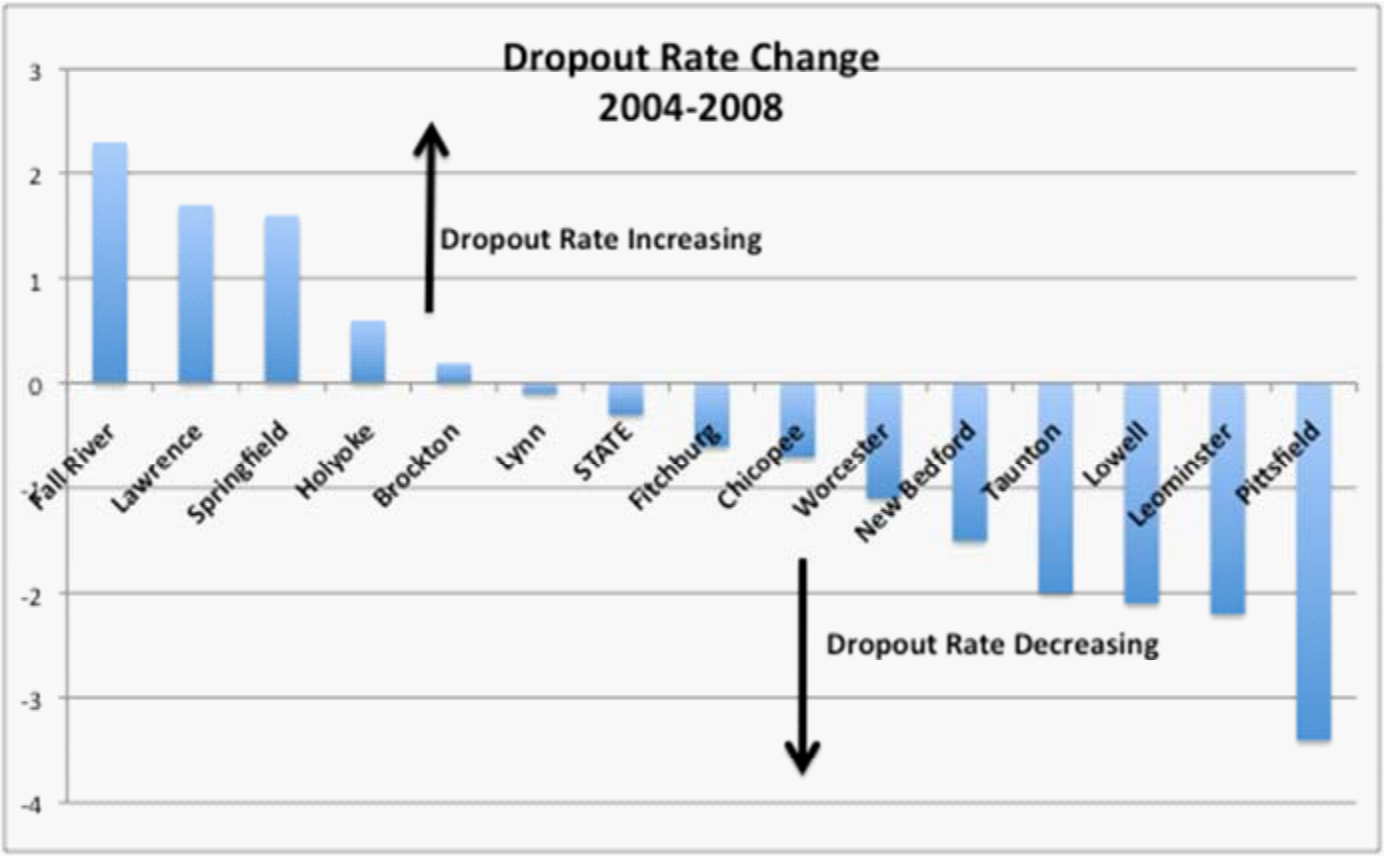
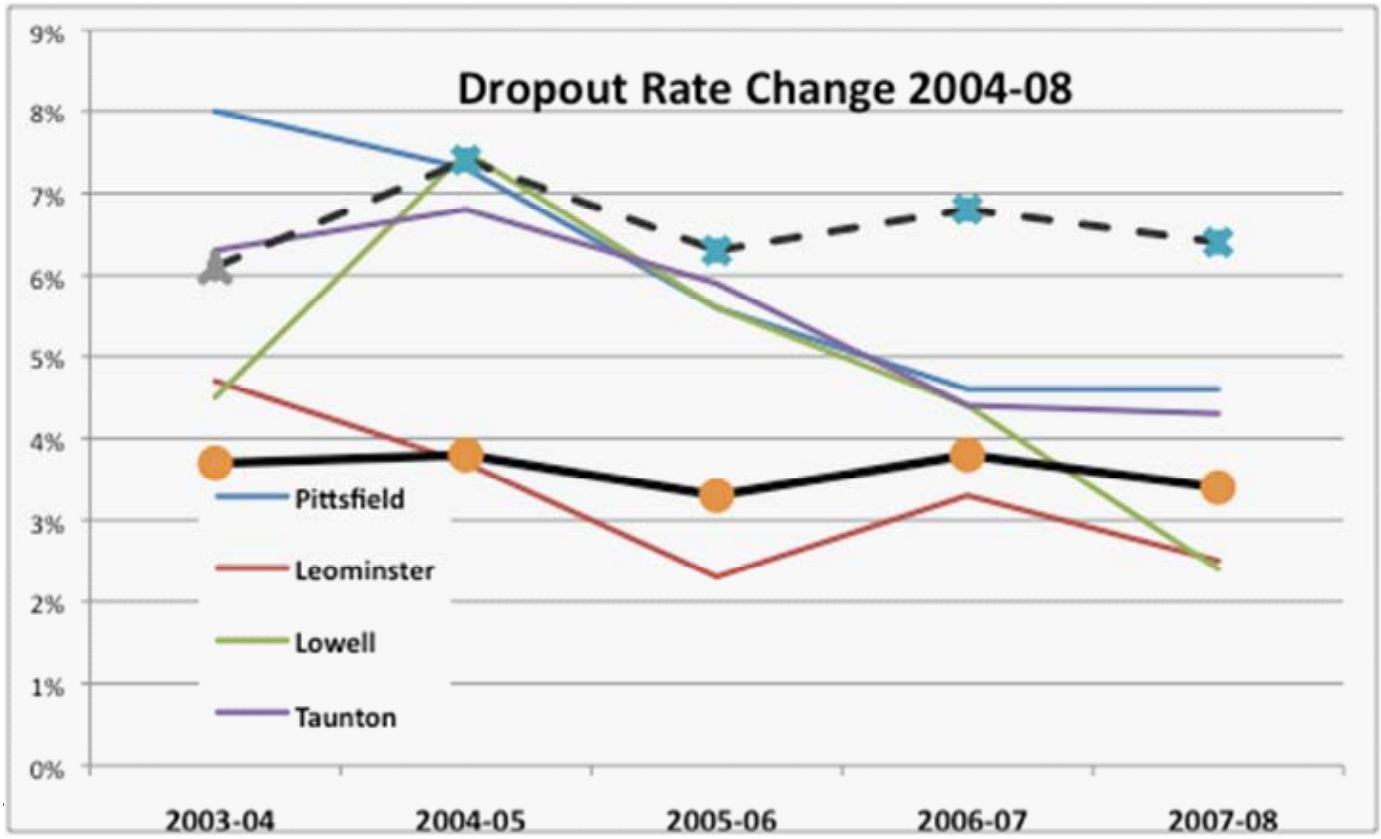


Chart 3: Top Districts in Reducing Dropout Rate



rate hasn't changed much. And supporters of the test say that shows high standards have not driven students away. But opponents of high stakes testing say there is a correlation. And both sides have research backing them up."[8]

While there is a relatively weak correlation between reduction in dropout rate over time and improved MCAS CPI over time, there is a relatively strong correlation between the percentages of students eligible for Free Lunch in a district and the dropout rate and in the change over time in the dropout rate. In the Middle Cities the correlation between Free Lunch and the average five-year dropout rate is .69. The correlation between Free Lunch and change in the dropout rate is .76. These are high values, which indicate that poverty has a powerful impact on dropout issues.

Districts of Interest

This study has identified several districts that have outperformed their peers in increasing MCAS scores and decreasing dropout rates.

Improved MCAS scores over time (listed largest to smallest gain over time)

- ELA – Holyoke (14.9 CPI points between 2004 and 2008); Worcester (14 points); Taunton (12.2 points); and Springfield (11.9 points).
- Math – Worcester (14.9 points); Lynn (14.7 points); Fitchburg (12.8 points); and Holyoke (12.6 points).

While these districts still have relatively low MCAS scores, they are demonstrating solid achievement gains over time.

It is encouraging that three districts present some of the greatest gains in ELA CPI while having high poverty rates. Springfield and Holyoke have over 70% of their students eligible for Free Lunch, with Lynn having 64% Free Lunch students. The only districts in the state with higher percentages of Free Lunch students than Holyoke, Springfield and Lynn are Chelsea and Lawrence. Despite high rates of poor students who are eligible for Free Lunch, these districts have organized their educational resources to produce solid gains over time.

Reduced dropout rate over time (listed largest to smallest reduction in dropout rate between 2004 and 2008)

- Pittsfield, down from 8.0% to 4.6%); Leominster (4.7% to 2.5%); Lowell (4.5% to 2.4%); and Taunton (6.3% to 4.3%).

Pittsfield is at the head of the class when the challenge is reducing the dropout rate, posting a 3.4% reduction over 4 years. The district has taken very specific steps to reduce student attrition. A February 2009 report listed the steps the district had taken to keep students in school. These included using data from early grades to predict later academic trouble; giving students a sense that high school success was directly connected to success in college and life; and establishing strong partnerships with community-based organizations to help students stay in school.[9]

Over-performing predicted MCAS scores based on percentage of Free Lunch (listed smallest to largest over-score)

- ELA – Worcester; Fitchburg; Lynn; Brockton.
- Math – Brockton; Fitchburg; Lynn.

It is interesting that three of the districts that showed strong over-performance in ELA have higher percentages of Free Lunch students than the median Free Lunch percentage of the Middle Cities. In math, Brockton and Lynn have higher percentages of Free Lunch students. (Worcester has 56.9% Free Lunch; Lynn – 63.8%; Brockton – 57.6% compared to a Middle Cities average of 56.5%.) This is encouraging in that it suggests that these cities are providing instruction that is effective in meeting the learning needs of their students and in overcoming any disadvantage that poverty may bring to some students.

Moving Forward

Taunton and Worcester exhibited strong performance in both improving MCAS scores and decreasing the dropout rate over time.

- In combined ELA and math scores between 2004 and 2008, Worcester improved 28.9 CPI points and Taunton improved 22.9 points, well above the Middle Cities average gain of 20.3 points.
- Taunton reduced its dropout rate by 2 percentage points, with Worcester lowering its dropout rate by 1.1 points between the 2003-04 and 2007-08 school years, strong improvement compared to the overall Middle Cites dropout rate reduction .5%.

It is beyond the scope of this research to identify the reasons for these two districts' educational achievement. The districts have little in common. Worcester is the second largest of the Middle Cities, with a student population of 22,876, while Taunton, with 7,998 students, is the ninth largest city in the group. Taunton has relatively low percentages of students eligible for Free Lunch (30.1%) compared to Worcester (56.9% Free Lunch). Based on these data, Worcester's work in improving MCAS scores and reducing dropout rates may be more exemplary because its students do present more poverty characteristics. Highlighting the reasons for these districts' educational improvement would be an interesting topic for future research.

Conclusion

While this analysis has identified districts that have outperformed their Middle Cities peers, perhaps the overall message of the work is that we have much work left to do. Even the better performing districts still have too many students who do not reach Advanced or Proficient on the MCAS, the standard for effective instruction.

- On the 2008 Grade 10 ELA MCAS, 74% of students statewide scored Advanced or Proficient. In the Middle Cities the figure was 54%, with wide variation. Brockton was close to state average at 71% while Taunton was at 69%. On the other end of the achievement scale were Lawrence (37% Advanced or Proficient) and Holyoke (43%).
- In math, the statewide Advanced or Proficient percentage was 72% with the Middle Cities figure at 49%. Leominster had 69% and Taunton 67% of their students in Advanced or Proficient, with Lawrence at 30% and Springfield at 37% in the top two categories.

Despite some successes, there is much work to do to boost student achievement in the Middle Cities. One of the more obvious challenges facing educators in these districts is the impact of poverty as measured by Free Lunch percentage in these school systems. After 17 years of education reform, the relationship between poverty and achievement remains pervasive and powerful. A report on the 2000 MCAS noted that:

> *Districts that are disadvantaged have much more work to do to overcome their demography and lift more of their students into success in school. After three MCAS administrations, it is clear that disadvantaged districts are having a hard time implementing the dramatic school reforms needed to help their teachers and students outperform their community characteristics.*[10]

Today, 10 years later, that statement is still true. Despite increases in pass rates and in the percentages of students achieving Advanced or Proficient across the state, education reform policy and practice has not been robust enough to mitigate the deleterious effects of poverty on educational attainment. The correlation between Free Lunch percentages and 2008 Grade 10 MCAS scores is over .71 for ELA and .79 for math for the Middle Cities, and any successful education reform in these districts will need to incorporate much more substantive assessment, instruction, and student support in order to be successful. With the recently passed education

reform legislation in Massachusetts, and with the potential changes brought to schools by the Obama administration's *Race To The Top* grant program, the Commonwealth may be positioned to improve struggling schools. Policy leaders might well look to some of the Middle Cities as pilot sites for the kinds of dramatic programs and policies needed to make schools effective engines of achievement for all students.

About the Author:

Dr. Robert D. Gaudet served as a Senior Research Analyst at the Rennie Center and also for the Donahue Institute at the University of Massachusetts.

About Pioneer:

Pioneer Institute is an independent, non-partisan, privately funded research organization that seeks to change the intellectual climate in the Commonwealth by supporting scholarship that challenges the "conventional wisdom" on Massachusetts public policy issues.

Recent Pioneer Publications

Why Race to the Middle?, White Paper, February 2010

Failure to Thrive: Job Creation and Loss in Massachusetts: 1990-2007, White Paper, January 2010

An Interim Report Card on Massachusetts Health Care Reform Part 1: Increasing Access, White Paper, January 2010

Debunking the Myths About Charter Public Schools, Policy Brief, January 2010

Drawing Lessons: Different Results from State Health Insurance Exchanges, Policy Brief, December 2009

Closing Springfield's Achievement Gap: Innovative Ways to Use MCAS Data to Drive School Reform, Policy Brief, October 2009

School-Based Management: A Practical Path to School District Reform, Policy Brief, September 2009

Driving the New Urban Agenda: Desired Outcomes for the Middle Cities Initiative, July 2009

Endnotes

1. Stergios, Jim, *Rehabbing Urban Development*, Pioneer Institute Center for Economic Opportunity, Feb 2007, discusses the Middle Cities comprised of Brockton, Chicopee, Fall River, Fitchburg, Holyoke, Lawrence, Leominster, Lowell, Lynn, New Bedford, Pittsfield, Springfield, Taunton, and Worcester.

2. Stergios, p. 22.

3. These percentages are weighted averages that take into account the different numbers of students in each district or school in calculating the figure.

4. For a consideration of the role of community demographics on students achievement, see Robert D. Gaudet, *Effective School Districts in Massachusetts: A Study of Student Performance on the 2002 MCAS assessments*, Donahue Institute, University of Massachusetts President's Office (Boston), 2003, at http://www.edbenchmarks.org/index/MCAS_Report_02.pdf.

5. All data are from the Massachusetts Department of Elementary and Secondary Education's web site.

6. The adjusted r2 for the Free Lunch/ELA CPI is .746 and for the Free Lunch/math CPI is .732. This number indicates the percentage of score variation accountable to the predictor (in this instance, Free Lunch percentage).

7. For a more in-depth study please refer to *Beyond Demographic Destiny: An Analysis of Massachusetts Minority and White Student Achievement Gaps*, a Pioneer Institute White Paper by by Richard Cross, Theodor Rebarber, Kathleen Madigan, and Bruce Bean, March 2010. http://www.pioneerinstitute.org/pdf/100312_beyond_demographic_destiny.pdf.

8. See *Does The MCAS Cause Students To Drop Out?* by Monica Brady-Myerov (WBUR), June 2, 2009, available at: http://www.projectdropout.org/2009/03/09/does-the-mcas-cause-kids-to-drop-out/

9. Rennie Center for Education Research and Policy, *Meeting the Challenge: Promising Practices for Reducing the Dropout Rate in Massachusetts Schools and Districts*, Rennie Center, Cambridge, MA. February 2009, pp. 13-14.

10. Gaudet, Robert, *Effective School Districts in Massachusetts: A Study of Student Performance on the 2000 MCAS assessments*, Donahue Institute, University of Massachusetts President's Office (Boston), 2001, p. 6.

85 Devonshire Street, 8th Floor, Boston, MA 02109 T: 617.723.2277 | F: 617.723.1880 | www.pioneerinstitute.org