Closing the Mathematics Achievement Gap

A Model for Improvement: Bay Shore School District

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Bay Shore School District

5,350 acres (8.35 Sq. Miles)
About the district…

The district is composed of five thousand students housed in five elementary schools, one middle school and one high school.

About the community…

The Bay Shore-Brightwaters community, located on the South Shore of Long Island, dates back to the 1700’s. Active community organizations include numerous civic associations, a Chamber of Commerce and a productive Business Improvement District.
Bay Shore School District

Mission Statement:

The Bay Shore School District Believes:

• That our schools exist for the benefit of our children and our community,

• That our children learn best when they are challenged by high expectations,

• That all children are capable of meeting high expectations when instructional strategies are adjusted to meet individual needs, and

• That the support of both families and community is essential.

Retrieved from www.bayshore.k12.ny.us
The Achievement Gap

Myths and Reality

“The important point is that all these measures are good for all students. The worst thing about much of the current discussion on how to eliminate the achievement gap is that it focuses on what should be done with minority students. This has the effect of making it look as if it is a minority problem.”

Statement of Problem

A significant performance gap exists in mathematics between various racial groups, K-9, in the Bay Shore School District.

The mean mathematics scores have increased in recent years, but the gap between white and minority students has widened.
4th Grade Cohort in 1999 & Results of 2003 Math 8 Exam (All Students)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Level 1 &amp; 2</td>
<td>33</td>
<td>17</td>
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<td>Level 3</td>
<td>44</td>
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<td>Level 4</td>
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Chart information based on School Report Card Data from www.nysed.gov
8th Grade Math Performance (White)

<table>
<thead>
<tr>
<th>Year</th>
<th>Level 1 &amp; 2</th>
<th>Level 3</th>
<th>Level 4</th>
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<td>42</td>
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<td>2001-2002</td>
<td>16</td>
<td>48</td>
<td>36</td>
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<tr>
<td>2002-2003</td>
<td>9</td>
<td>59</td>
<td>32</td>
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Chart information based on School Report Card Data from www.nysed.gov
8th Grade Math Performance (Black)

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<tr>
<th>Year</th>
<th>Level 1 &amp; 2</th>
<th>Level 3</th>
<th>Level 4</th>
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<tr>
<td>2001-2002</td>
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<td>2002-2003</td>
<td>32</td>
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Chart information based on School Report Card Data from [www.nysed.gov](http://www.nysed.gov)
8th Grade Math Performance (Hispanic)

<table>
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<td>Level 3</td>
<td>19</td>
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<tr>
<td>Level 4</td>
<td>4</td>
<td>15</td>
<td>10</td>
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Chart information based on School Report Card Data from www.nysed.gov
Overarching Principles
Constructing a Model to Improve Student Achievement
W. Edwards Deming

- Create constancy of purpose toward improvement
- Adopt the new philosophy
- Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place
- Improve constantly
- Institute training on the job
- Institute leadership - the aim of supervision should be to help people do a better job.
- Drive out fear, so that everyone may work effectively
- Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems
- Institute a vigorous program of education and self-improvement
- Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job

Excerpt from Out of the Crisis, copyright (c) 1986 by the W. Edwards Deming Institute, Washington, DC.
Civic Capacity
- Team approach to problem solving
- School - University Partnerships
- School's contribution to community
- Parental Involvement
- Political Support for Ed
- Coalition-building

Educational Organization
- School Board Governance/Composition of Boards
- Contracts
- Administrative Leadership
- Teacher/Admin Turnover
- Relationship between NYSED/local
- Unfunded Federal mandates
- Piemall reform
- Federal mandates at local State and
- Knowledge sharing
- System flexibility
- Shared vision/Clear goal setting

Instructional Delivery
- Pre-service education
- Instructional material
- Professional Development
- Math anxiety
- Differentiated Instruction
- Assessment of teachers
- Outcome-based focus
- Math anxiety
- Level of technology usage
- Subject integration
- Class size
- Data analysis driven
- Assessment for/of learning
- (Behaviorist/constructivist)

Social Capital
- Trust and understanding
- School/Community Connection
- PTA
- Relationships between admin & teachers - teacher to teacher - teacher to student

Social/Economic Issues
- Inequitable funding
- Math Anxiety
- Gender inequity
- ESL
- Early childhood experience
- StudentTransience
- Poor Nutrition
- Inadequate facilities

Mathematics Achievement Gap
- Inadequate facilities
- Low Expectations at local state and
- Federal level
- Knowledge sharing
- System flexibility
- Shared vision/Clear goal setting

Educational Organization
- School Board Governance/Composition of Boards
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A Model for Improving Student Achievement

To close the performance gap between various racial groups in K-9 mathematics

Content and Pedagogy
- Professional Development
  - Facilitate Learning Conversations
- School Culture
- Leadership Capacity
  - Cultivate Instructional Leaders

Social and Community Relations
- Parental and Familial Involvement
  - Participate in shared decision-making
- Student Empowerment
  - Develop co-curricular opportunities
- Community Outreach
  - Improve communication with stakeholders
Disaggregated Data shows a gap between students of color, Hispanic and white students. Although Bay shore School District is meeting AYP (Annual Yearly Progress), there is concern that these students are not being prepared to meet the increasing challenges each year imposed by the state.

It should be noted that NCLB though Title I sets forth funding to ensure that all children have a fair, equal and significant opportunity to obtain a high-quality education and reach AT MINIMUM, proficiency on challenging state academic achievement standards and state academic tests. This implies that all students should have the opportunity to perform at Level 4 on the NYS Assessments in Mathematics and at the 85 or above on the Math A Regents exam.
Solutions for Closing the Achievement Gap

**NCLB**

Part B of Title II outlines the Mathematics and Science Partnerships. This new initiative promotes greater mathematics and science achievement for students by:

- Improving teacher education at the collegiate level
- Promoting collaboration between elementary and secondary school teachers and mathematicians
- Developing challenging mathematics and science curricula
- Expanding upon the teacher training that mathematics teachers and science teachers receive in their disciplines
## School Reform Designs: An Overview

<table>
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<th>Ferguson The Tripod Project</th>
<th>Content</th>
<th>Pedagogy</th>
<th>Social/Community Relations</th>
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Action: Facilitate Learning Conversations

- Focus on Strong Content Knowledge in Mathematics for Teachers K-12 (*Not Program-based but Knowledge-based*)

- Assessment literacy – application of assessment for learning and assessment of learning

- Generic Teaching Skills – Feedback to students, enhancing intrinsic motivation, ability to provide challenging material, support for student success, implementing inquiry-based instruction.

- Pedagogical Content Knowledge – what students already know, uncovering misconceptions students may have, listening to students

- Measure effectiveness by looking at student achievement rather than teacher satisfaction
Professional Development

Action: Facilitate Learning Conversations

• Ongoing collaboration and practice

• Tied to Learning Communities – “communities of teacher researchers”

• Establish Standards of Teaching Rubric*
  Frame conversations with and among teachers around the four domains:
  Planning and Preparation
  Classroom Environment
  Instruction
  Professional Responsibilities

* Danielson, Charlotte Enhancing Professional Practice (ASCD 1996)
School Culture

Action: Establish Learning Communities

• Monitoring progress of students through local systems of accountability

• Create outcomes and performance standards

• Create mechanisms for providing feedback – Student report cards, communication with students

• Establish routines for regularly evaluating and reflecting on actions

• Collaboratively implement, assess and adjust instruction as it happens

• Set Short-term goals with measurable results
Leadership Capacity

Action: Cultivate Instructional Leaders

School Administrators

• Support teachers who regularly examine student work and assessment results for the purpose of revising their instructional strategies
• Understand that data plays a key roll in professional conversations and know how to use it to inform instruction
• Participate in and promote continuous learning and improvement
• Provide mechanisms to keep track of students throughout their K-12 experience.

Teachers

• Lead their learning communities and bridge between school administrators and colleagues
Social and Community Relations

A Model for Improving Student Achievement
Parental and Familial Involvement

Action: Participate in Shared-Decision Making

- Establish a district-level advisory council and committee
- Develop an Action Team for school, family, and community partnerships to oversee the development of school’s programs
- Create networks to link families
- Encourage parents/family to be involved in PTA/PTO

Student Empowerment

Action: Encourage Community Building and Connection

- Create “Spirit Days” and student activities (including evening recreation activities)
- Offer opportunities to participate in community service
- Establish student governance
- Develop cross-cultural understanding through Diversity Night
- Encourage students to participate in shared decision-making
- Involve students in committee membership
- Cultivate peer tutoring opportunities
Community Outreach

Action: Improve Communication with Stakeholders

• Survey families on students’ needs and families suggestions and reactions to school programs
• Create community partnerships (e.g., collaboration with other schools and local colleges and universities)
• Coordinate resources from the community for families, students, and the school (e.g., business, health, cultural, recreational, etc.)
• Provide information to community regarding school policies, reforms, assessments, etc.

Future Recommendations

- Data used to analyze student achievement should include the following: report cards, local standardized tests (Terra Nova), student management system database (Powerschool), NYS Assessments
- Schools should maintain their own set of disaggregated data for each academic year
- Establish measures for success (Assessment Plan)
- Focus on bridging as well as bonding with school, community, and civic organizations
- Create Professional Development Plan based on learning communities concept
- Organize Academic Leadership Teams and Teacher Learning Communities