# Improving Student Achievement and Closing the Achievement Gap

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In the following report, Hanover Research examines best practices for improving student achievement, including strategies for engaging students and improving student outcomes. Best practices and case studies examine achievement levels and approaches for certain student sub-groups, academic programs, and innovative solutions at high-needs schools.

HANOVER RESEARCH

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# EXECUTIVE SUMMARY AND KEY FINDINGS

## INTRODUCTION

In the following report, Hanover Research examines best practices for improving student achievement, including strategies for engaging students and improving student outcomes. Best practices and case studies examine issues of staffing, academic programs, and innovative solutions at high needs schools, and profile the use of programs such as TIF in recruiting highly effective teachers to these schools. The report also includes a review of popular strategies for improving student achievement and outcomes, including in career and technical education.

Dr. Joseph Murphy, of Vanderbilt University, provides a helpful guiding perspective as districts and their schools contemplate narrowing disparities in student performance. He comments that, "**by and large, schools do not cause achievement gaps**" and thus "**schools cannot close achievement gaps alone**."[1] Effective progress in closing achievement gaps must be nuanced and address both academic and environmental factors: "Ultimately, programs that rely entirely on increasing academic standards without parallel attention to social-emotional factors associated with achievement motivation and performance will be less likely to improve student achievement outcomes."[2] Ultimately, however, Murphy does suggest that, **"since low-income and minority students are more school-dependent than their more advantaged peers, there is potential for schools to help solve the problem."**[3]

This report comprises two sections:

- **Section I: Closing the Achievement Gaps for Student Sub-Groups** investigates the current state of achievement gaps and promising, research-based approaches to narrowing performance gaps based on the following:
  - Socioeconomic Status
  - Race and Ethnicity
  - Language Background
  - Disability Status

- **Section II: Profiles** explores eight types of interventions designed to increase student achievement and engagement more generally. The following approaches span across the classroom, the school, and the greater community:
  - Extended Learning Opportunities
  - Project-Based Learning
  - Career and Technology Education
  - Teacher Incentive Funding
  - Curriculum Mapping
  - Community-Building Programs
  - Parental Involvement Programs
  - Cultural Awareness Programs

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[1] Murphy, J. "Closing Achievement Gaps: Research-Based Lessons for Educators." Vanderbilt University. [PowerPoint Presentation] www.esc-cc.org/Downloads/ACH_GAP_PARTS_A_B_C Murphy 1 26 112.ppt
[2] Becker, B. and Luther, S. "Social Emotional Factors Affecting Achievement Outcomes Among Disadvantaged Students: Closing the Achievement Gap." *Educational Psychologist,* 37, 2002, pp. 197-214.
[3] Ibid.

## KEY FINDINGS

- **Socioeconomic status is a major factor contributing to student achievement gaps.** Recent research indicates that by far, socioeconomic status (SES) has the strongest correlation to cognitive scores than any other factor. Arts education and holistic preschools are among the research-based initiatives that have proven to be successful in narrowing this SES achievement gap.

- **Student race/ethnicity, ELL status, and special education status also account for student achievement gaps.** Research has demonstrated that when ELL students are not isolated in low-achieving schools, and are able to attend schools with a certain percentage of white students, achievement gaps narrow. For special education achievement gaps, promising strategies include the alignment of curriculum to state standards, an emphasis on inclusion and access to the general education curriculum, high standards for student achievement, and effective staff recruitment and professional development.

- **Strategies for reducing achievement gaps span across many levels of student support, including the classroom, the school, and the larger community.** At the classroom level, practices include career and technical education, project-based learning, and extended learning opportunities. At the school level, initiatives may include curriculum mapping, the Teacher Incentive Fund, and holistic preschools, while community-level strategies include cultural awareness programs, parental involvement programs, and community building programs.

- **These specific strategies align with the National Education Association's broader recommendations for closing achievement gaps**, which include comprehensive support for students, enhanced cultural competence, outreach to families, supportive classrooms and schools, strong district support, adequate resources and funding, and access to qualified staff.

# SECTION I: CLOSING THE ACHIEVEMENT GAPS FOR STUDENT SUB-GROUPS

The following section examines the current state of achievement gaps and promising, research-based approaches to narrowing performance gaps based on the following student statuses: socioeconomic status (SES), race and ethnicity, language background, and disability status. As will become apparent throughout this section, there is large degree of cross-sectionality and interrelatedness between types of student achievement gaps. For instance, it difficult to isolate SES-based achievement gaps from those based in race or ethnicity. Similarly, language background and race and ethnicity are logically related.

## SOCIOECONOMIC STATUS

There is an extensive body of research and secondary literature surrounding the socioeconomically-based achievement gap in student performance. Several studies have confirmed that household income is positively associated student IQ, achievement levels, and the likelihood that students will graduate high school and attend college.[4] A 2012 article published in *American Educator¸* a publication of the American Federation of Teachers, examined the question, "Why does family wealth affect learning?" Author Daniel Willingham, professor of cognitive psychology at the University of Virginia, explains that these types of associations are driven by "two broad categories of effects:"

- First, as one might expect, wealthier parents have the resources to provide more and better learning opportunities for their children.

- Second, children from poorer homes are subject to chronic stress, which research from the last 10 years has shown is more destructive to learning than was previously guessed.[5]

The stress factors are compounded by other, more obvious and tangible consequences of low-SES: mothers often lack necessary healthcare during pregnancy and their children have

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[4]    [1] Duncan, G., J. Brooks-Gunn, and P. Kato Klebanov. "Economic Deprivation and Early Childhood Development." *Child Development,* 65:2, 1994, pp. 296-318. http://www.ncbi.nlm.nih.gov/pubmed/7516849
[2] Sirin, S. "Socioeconomic Status and Academic Achievement: A Meta-Analytic Review of Research." *Review of Educational Research,* 75:3, 2005, pp. 417-453.
http://steinhardt.nyu.edu/scmsAdmin/media/users/lec321/Sirin_Articles/Sirin_2005.pdf
[3] "Percentage of High School Dropouts among Persons 16 through 24 years old (Status Dropout Rate), by Income Level, and Percentage Distribution of Status Dropouts, by Labor Force Status and Educational Attainment: 1970 through 2007." National Center for Education Statistics.
http://nces.ed.gov/programs/digest/d08/tables/dt08_110.asp
[4] Conley, D. "Capital for College: Parental Assets and Postsecondary Schooling." *Sociology of Education,* 74:1, 2001, pp. 59-72.
http://www.jstor.org/discover/10.2307/2673145?uid=3739776&uid=2&uid=4&uid=3739256&sid=21104373858943
[5] Bulleted items taken verbatim from: Willingham D. "Why Does Family Wealth Affect Learning?" *American Educator,* Spring 2012, p. 33. http://www.aft.org/pdfs/americaneducator/spring2012/Willingham.pdf

an increased risk of low birth weight; children are also at greater risk of fetal alcohol syndrome, and poor nutritional support. [6]

Data from the 2012 College Board SAT report provide an illustration of this pattern, based on results from 1,664,479 total students from the class of 2012. (Figure 1.1)

**Figure 1.1: Mean SAT Scores, 2012, by Family Income**

| FAMILY INCOME | PERCENT OF TOTAL TEST-TAKERS | CRITICAL READING | MATHEMATICS | WRITING |
|---|---|---|---|---|
| $0–$20,000 | 14% | 433 | 461 | 428 |
| $20,000–$40,000 | 17% | 463 | 481 | 453 |
| $40,000–$60,000 | 14% | 485 | 500 | 473 |
| $60,000–$80,000 | 13% | 499 | 512 | 486 |
| $80,000–$100,000 | 11% | 511 | 525 | 499 |
| $100,000–$120,000 | 10% | 523 | 539 | 512 |
| $120,000–$140,000 | 5% | 527 | 543 | 517 |
| $140,000–$160,000 | 4% | 534 | 551 | 525 |
| $160,000–$200,000 | 5% | 540 | 557 | 534 |
| Greater than $200,000 | 8% | 567 | 589 | 566 |

Source: The College Board[7]

Research indicates that this gap is increasing: "The achievement gap between children from high and low income families is roughly 30 to 40 percent larger among children born in 2001 than among those born twenty-five years earlier. In fact, it appears that the income achievement gap has been growing for at least fifty years, though the data are less certain for cohorts of children born before 1970." [8]

One approach to narrowing the SES achievement gap that has recently gained visibility is **arts education**. Reporter Anne O'Brien wrote articles for the Learning First Alliance and Edutopia, based on a study from the National Endowment for the Arts, which indicate the promise of arts to counteract some of the negative effects of low SES status.[9] The study in question compared high-arts, low-SES students to their low-arts, low-SES peers, using NAEP

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[6] [1] Hack, M. et al. "School-Age Outcomes in Children with Birth Weights under 750 g." *New England Journal of Medicine*, 331:12, 1994. http://www.nejm.org/doi/full/10.1056/NEJM199409223311201
[2] Cone-Wesson, B. "Prenatal Alcohol and Cocaine Exposure: Influences on Cognition, Speech, Language, and Hearing." *Journal of Communication Disorders*, 38:4, 2005. http://www.cckm.ca/CPSLPR/pdf/ConeWesson2005.pdf

[7] "Total Group Profile Report." The College Board, 2013. http://media.collegeboard.com/digitalServices/pdf/research/TotalGroup-2012.pdf

[8] [1] Reardon, S. "The Widening Academic Achievement Gap Between the Rich and the Poor: New Evidence and Possible Explanations." Stanford University, July 2011. http://cepa.stanford.edu/content/widening-academic-achievement-gap-between-rich-and-poor-new-evidence-and-possible
[2] Reardon, S. "The Widening Socioeconomic Achievement Gap: Evidence, Explanations, And Implications." The University of Virginia, September 2010. http://curry.virginia.edu/uploads/resourceLibrary/Reardon_Sept2010.pdf

[9] [1] O'Brien, A. "Can Arts Education Help Close the Achievement Gap?" Learning First Alliance, April 4, 2012. http://www.learningfirst.org/can-arts-education-help-close-achievement-gap
[2] O'Brien, A. "How to Close the Achievement Gap: Arts Education." Edutopia, September 11, 2013. http://www.edutopia.org/blog/art-education-closing-achievement-gap-anne-obrien

scores, GPAs, high school graduation rates, college attendance rates, and measures of civic participation, such as registered voter status and newspaper readership.[10] Although it is important to note that this study only indicates correlation, not causation, its findings are encouraging:

- **High-arts, low-SES students were more likely to graduate than low-arts, low-SES students -- and all students:** Only 4 percent of high-arts, low-SES students did not graduate from high school, compared to 22 percent of low-arts, low-SES students -- and 7 percent of students overall (though the latter difference does not appear to be statistically significant).

- **High-arts, low-SES students were more likely to both attend and finish college than low-arts, low-SES students:** 71 percent of high-arts, low-SES students attended college after high school, compared to 48 percent of low-arts, low-SES students; 18 percent of high-arts, low-SES students who started college achieved a bachelor's degree and 24 percent achieved an associate's degree, compared to 6 percent and 10 percent, respectively, of low-arts, low-SES students.

- **High-arts, low-SES students were more likely to register to vote than low-arts, low-SES students -- and all students:** 78 percent of high-arts, low-SES students registered to vote, compared to 67 percent of low-arts, low-SES students -- and 76 percent of all students (though the latter difference was not statistically significant).[11]

The Chairman of the National Endowment for the Arts, Rocco Landesman, commented on the nuanced implications of the study, arguing that, "Arts education doesn't take place in isolation, [...] It has to take place as part of an overall school and education reform strategy. This report shows that arts education has strong links with other positive educational outcomes."[12]

Another approach to closing the SES-based achievement gap is **holistic preschools.** For example, Chicago Child-Parent Centers (CPCs) have offered a variety of services for low-income children and their families from preschool to grade 3, with programming that has "promoted parent involvement through home visits, classroom volunteer opportunities, workshops and courses, and parent–teacher meetings."[13] The CPCs have been guided by the principle that a "school-based, stable learning environment during preschool, in which parents are active and consistent participants in their child's education, will result in greater academic achievement."[14] In fact, parental participation is required as part of its

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[10] "New NEA Research Report Shows Potential Benefits of Arts Education for At-Risk Youth: Youth Have Better Academic Outcomes, Higher Career Goals, and Are More Civically Engaged." The National Endowment for the Arts, March 30, 2012. http://arts.gov/news/2012/new-nea-research-report-shows-potential-benefits-arts-education-risk-youth

[11] Bulleted items taken verbatim from: O'Brien, A. "How to Close the Achievement Gap: Arts Education," Op. cit.

[12] "New NEA Research Report Shows Potential Benefits of Arts Education for At-Risk Youth: Youth Have Better Academic Outcomes, Higher Career Goals, and Are More Civically Engaged," Op. cit.

[13] "Research Brief: Family Involvement Makes a Difference in School Success."  Harvard Family Research Project, 2006, p. 2. www.hfrp.org/content/download/1263/48766/file/family_involvement_success.pdf

[14] "Child Parent Centers." Promising Practices Network. www.promisingpractices.net/program.asp?programid=98

programming, which emphasizes "a child-centered, individualized approach to social and cognitive development."[15]

Several studies examining the outcomes of CPC programs have shown positive results. As described by the Harvard Family Research Project, children who participated in CPC programming were "more prepared for kindergarten and less likely to be referred to special education."[16] In addition, their grade 8 reading test scores were higher than their peers, while they also enjoyed higher high school graduation rates and lower grade retention rates. Finally, parental involvement during preschool years at CPC programming was shown to lead to greater involvement "and greater student performance" during elementary school.

## RACE AND ETHNICITY

As illustrated in Figure 1.2, it is an evident fact that racial and ethnic achievement gaps persist in the public education system. However, there is a great deal of contentious research and media coverage about the state of these types of gaps.

**Figure 1.2: Mean SAT Scores by Ethnicity, 2012**

| TEST TAKERS WHO IDENTIFIED THEMSELVES AS… | PERCENTAGE OF TOTAL TEST-TAKERS | CRITICAL READING | MATHEMATICS | WRITING |
|---|---|---|---|---|
| American Indian or Native American | 1% | 482 | 489 | 462 |
| Asian, Asian American, or Pacific Islander | 12% | 518 | 595 | 528 |
| Black or African American | 13% | 428 | 428 | 417 |
| Mexican or Mexican American | 7% | 448 | 465 | 443 |
| Puerto Rican | 2% | 452 | 452 | 442 |
| Other Hispanic, Latino, or Latin American | 8% | 447 | 461 | 442 |
| White | 51% | 527 | 536 | 515 |
| Other | 4% | 491 | 516 | 491 |
| No Response | 3% | 444 | 502 | 448 |

Source: The College Board

The Economic Policy Institute issued a report in 2002, which revealed substantial differences in test scores by ethnicity, as the "average math achievement [was] 21% lower for blacks than for whites and 19% lower for Hispanics."[17] In addition, "family structure and educational expectations" have been shown to be strongly tied to other factors influencing academic achievement such as race/ethnicity and socioeconomic status. However, research indicates that **socioeconomic status has the strongest correlation to "cognitive scores"**

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[15] Ibid.
[16] "Research Brief: Family Involvement Makes a Difference in School Success," Op. cit., p. 2.
[17] Lee, V. and Burkham, D. "Inequality at the Starting Gate: Social Background Differences in Achievement as Children Begin School." Economic Policy Institute, 2002.  www.epi.org/publications/entry/books_starting_gate/

**than any other factor including race**, and these students often suffer from attending schools of lower-quality.[18] A more recent 2012 "Talk of the Nation" segment on National Public Radio also discussed and compared race/ethnic and income-based achievement gaps. Several studies indicate that this gap has closed throughout the past 50 years, while "the gulf between rich and poor students, however, has widened dramatically."[19] These studies indicate that "family income serves as a better predictor of school success."

There have been several instances of alarming adjustments to student achievement expectations based on race. NBC featured this issue in a 2013 "Nightly News" segment: After the 2001 passage of the No Child Left Behind Act, with its 100 percent proficiency mandate by 2014, states sought waivers from this requirement which included new performance targets "that led to differing expectations for children depending on their race."[20] Specifically, Virginia and Florida have "decided that a lower rate of success for student performance within under-performing demographics is necessary." [21] These approaches are problematic, unethical, and ineffective in closing any achievement gap.

This report lacks sufficient space to adequately address the achievement patterns and individual needs of Hispanic, Asian American, Pacific Islander, American Indian, Alaska Native, African American, and the many other student backgrounds found in the public education system; however, the subsequent section devotes time to describing the benefits of effective approaches to increasing cultural awareness in schools.

## LANGUAGE BACKGROUND

The National Education Association states that the achievement gap between ELL and Non-ELLs is a "deeply rooted, pervasive, complex, and challenging" issue. This achievement disparity is illustrated in Figure 1.3, which shows the average SAT scores across the three content areas for native English students, dual language speakers (including English), and ESL students. As one might expect, these gaps are pronounced in critical reading and writing sections. Additionally, this sub-population of students is expected to grow substantially before 2020. Projections from the Pew Research Center estimate that the number of school-age children of immigrants will increase from 12.3 million in 2005 to 17.9 million in 2020.[22] A significant portion of these students will likely require ELL services.[23]

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[18] Ibid.

[19] "Income, More Than Race, Is Driving Achievement Gap." National Public Radio, Talk of the Nation. http://www.npr.org/2012/02/13/146816813/income-more-than-race-is-driving-achievement-gap

[20] "Race-Based Academic Targets Raise Eyebrows." NBC Nightly News, March 6, 2013. http://www.nbcnews.com/video/nightly-news/51074245#51074245

[21] [1] "Editorial: Virginia's Race-Based Education." *The Washington Times,* November 13, 2012. http://www.washingtontimes.com/news/2012/nov/13/virginias-race-based-education/
[2] Higham, M. "States Address Achievement Gap By Minimizing Racial Expectations." The Independent Voter Network, January 11, 2013. http://ivn.us/2013/01/11/states-address-achievement-gap-by-minimizing-racial-expectations/

[22] Passel, J. and Cohn, D. "U.S. Population Projections: 2005-2050." The Pew Research Center, February 2008. http://www.pewhispanic.org/files/reports/85.pdf

A 2008 research project conducted by the Pew Research Center focuses on other aspects of ELLs school environments that may impact achievement gaps, finding that "**when ELL students are not isolated in low-achieving schools, their gap in test score results is considerably narrower**."[24] More specifically, the study examined standardized testing data in five states with the highest proportions of ELL students (Arizona, California, Florida, New York and Texas). When ELL students attended public schools that reached a minimum percentage number of white students, "the gap between the math proficiency scores of white students and ELL students was considerably narrower." These findings suggest that these types of achievement gaps may be partially attributable to the environment and resources at their public schools.

**Figure 1.3 Mean SAT Scores by Language Background**

| FIRST LANGUAGE LEARNED | PERCENTAGE OF TOTAL TEST-TAKERS | CRITICAL READING | MATHEMATICS | WRITING |
|---|---|---|---|---|
| English | 72% | 507 | 514 | 494 |
| English and Another | 16% | 479 | 509 | 480 |
| Another Language | 12% | 461 | 526 | 470 |

Source: The College Board

Dual Language Education is one research-based instructional practice that has emerged as successful in increasing the achievement of ELL students. In a 2004 article, "The Astounding Effectiveness of Dual Language Education for All," researchers from George Mason University conducted a study involving ELLs and found that one-way and two-way **dual language enrichment models have "substantial power to enhance student outcomes and fully [close] the achievement gap" between ELLs and their native English-speaking peers.**[25] Research was based on 18 years of longitudinal data from 23 diverse districts and 15 states. While traditional remedial programs position students to complete one year's progress in an academic year, they merely maintain student's preexisting achievement gaps. However, dual language enrichment models present the mainstream curriculum through two languages. "Teachers in these bilingual classes create the cognitive challenge through thematic units of the core academic curriculum, focused on real- world problem solving that stimulate students to make more than one year's progress every year, in both languages."

The World-Class Instructional Design and Assessment Consortia developed a research-based resource that is "designed to help individual teachers, teaching teams, and district-teams evaluate and improve their EL instructional practices."[26] This article provides an overview of

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[23] Fry, R. "The Role of Schools in the English Language Learner Achievement Gap." The Pew Research Center, June 26, 2008. http://www.pewhispanic.org/2008/06/26/the-role-of-schools-in-the-english-language-learner-achievement-gap/

[24] Ibid.

[25] Collier V. and Thomas, W. "The Astounding Effectiveness of Dual Language Education for All." The National Association for Bilingual Education Journal of Research and Practice, 2:1, 2004. http://hillcrest.wacoisd.org/UserFiles/Servers/Server_345/File/Publications/ELL/Dual%20language%20survey.pdf

[26] Robertson, K. "Essential Actions: 15 Research-based Practices to Increase ELL Student Achievement." Colorin Colorado, 2004. http://www.colorincolorado.org/article/61084/

a matrix for academic language success, with 15 action items, the research-based evidence in support of each, and implementation guidance from educators and district leaders across the country.[27] The incorporation of the action items is "designed to stimulate professional conversation about meeting the academic language needs of ELLs and [the items] do not need to be followed in order."[28] Figure 1.4 below presents these 15 action items.

**Figure 1.4: Essential Actions for Academic Language Success**

| | ACTION 1 Capitalize on the resources and experiences that ELLs bring to school to build and enrich their academic language. | ACTION 2 Analyze the academic language demands involved in grade-level teaching and learning. | ACTION 3 Apply the background knowledge of ELLs, including their language proficiency profiles, in planning differentiated language teaching. |
|---|---|---|---|
| **INSTRUCTION-FOCUSED** | ACTION 4 Connect language and content to make learning relevant and meaningful for ELLs. | ACTION 5 Focus on the developmental nature of language learning within grade-level curriculum. | ACTION 6 Reference content standards and language development standards in planning for language learning. |
| | ACTION 7 Design language teaching and learning with attention to the sociocultural context. | ACTION 8 Provide opportunities for all ELLs to engage in higher-order thinking. | ACTION 9 Create language-rich classroom environments with ample time for language practice and use. |
| | ACTION 10 Identify the language needed for functional use in teaching and learning. | ACTION 11 Plan for language teaching and learning around discipline-specific topics. | ACTION 12 Use instructional supports to help scaffold language learning. |
| **TEACHER COLLABORATION-FOCUSED** | ACTION 13 Integrate language domains to provide rich, authentic instruction. | ACTION 14 Coordinate and collaborate in planning for language and content teaching and learning. | ACTION 15 Share responsibility so that all teachers are language teachers and support one another within communities of practice. |

Source: World-Class Instructional Design and Assessment Consortia[29]

## DISABILITY STATUS

The enactment of No Child Left Behind increased the attention researchers, policy makers, and educators devoted to the academic proficiency of students with disabilities. For example, the 1990 Individuals with Disabilities Education Act (IDEA) requires public schools to meet the educational needs of students with disabilities, an estimated 7 million

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[27] "Action 3: Apply The Background Knowledge Of English Language Learners." Taken from: Essential Actions: 15 Research-based Practices to Increase ELL Student Achievement, World-Class Instructional Design and Assessment Consortia, pp. 20-24. http://www.colorincolorado.org/pdfs/essential-action-three.pdf

[28] Robertson, Op. cit.

[29] Taken nearly verbatim from: "Figure E: Essential Actions for Academic Language Success." World-Class Instructional Design and Assessment Consortia. http://www.colorincolorado.org/pdfs/articles/quilt.pdf

students.[30] Recently, the Department of Education under the Obama administration announced an increased effort to monitor how diligently schools are reporting data regarding their special education students. In late June of 2014, Education Secretary Arne Duncan stated that his department for the first time will consider outcomes: "special-education students' scores on standardized tests [specifically NAEP], the gap in test scores between students with and without disabilities, the high school graduation rate for disabled students and other measures of achievement."[31] A "complex matrix" will weigh these and other factors.

Despite these efforts and increased federal oversight of Special Education, significant gaps remain: "While various studies have shown that students with different learning disabilities have benefitted academically from curricula and teaching methods tailored to meet their needs, most research finds significant achievement gaps between disabled and nondisabled students."[32] These gaps are indicated in Figures 1.5 and 1.6. The data in Figure 1.5 suggest an alarming potential, as the achievement gaps that separate older disabled students from their non-disabled peers are larger than those present among younger cohorts of students. It is important to keep in mind that these data are not longitudinal and do not reflect change over time.

**Figure 1.5: Performance Gaps by Ability Status, NAEP, 2013**

| GRADE LEVEL | CONTENT AREA | PERCENT OF STUDENTS AT PROFICIENT AND ADVANCED LEVELS | | ACHIEVEMENT GAP BETWEEN STUDENTS WITH AND WITHOUT DISABILITIES |
|---|---|---|---|---|
| | | WITH DISABILITIES | WITHOUT DISABILITIES | |
| 4th Grade | Math | 18% | 45% | 27% point gap |
| | Reading | 11% | 38% | 27% point gap |
| 8th Grade | Math | 8% | 39% | 31% point gap |
| | Reading | 9% | 40% | 31% point gap |

Source: The National Center for Education Statistics[33]

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[30] Taken verbatim from: Layton, L. "States' Special Education Services Face Tighter Oversight by the Obama Administration." *The Washington Post*, June 24, 2014 http://www.washingtonpost.com/local/education/states-special-education-services-face-tighter-oversight-by-the-obama-administration/2014/06/23/a103031e-fb36-11e3-b1f4-8e77c632c07b_story.html

[31] Ibid.

[32] Kosiewicz, H. "Achievement Gap between Disabled and Nondisabled Students." *Education Week,* Research Center, December 24, 2008. http://www.edweek.org/rc/articles/2008/12/24/sow1224.h27.html

[33] "What Proportions Of Student Groups Are Reaching Proficient?" The National Center for Education Statistics. http://nationsreportcard.gov/reading_math_2013/#/student-groups

**Figure 1.6: NAEP Results, Reading Achievement by Disability Status, 12th Grade, 2005**
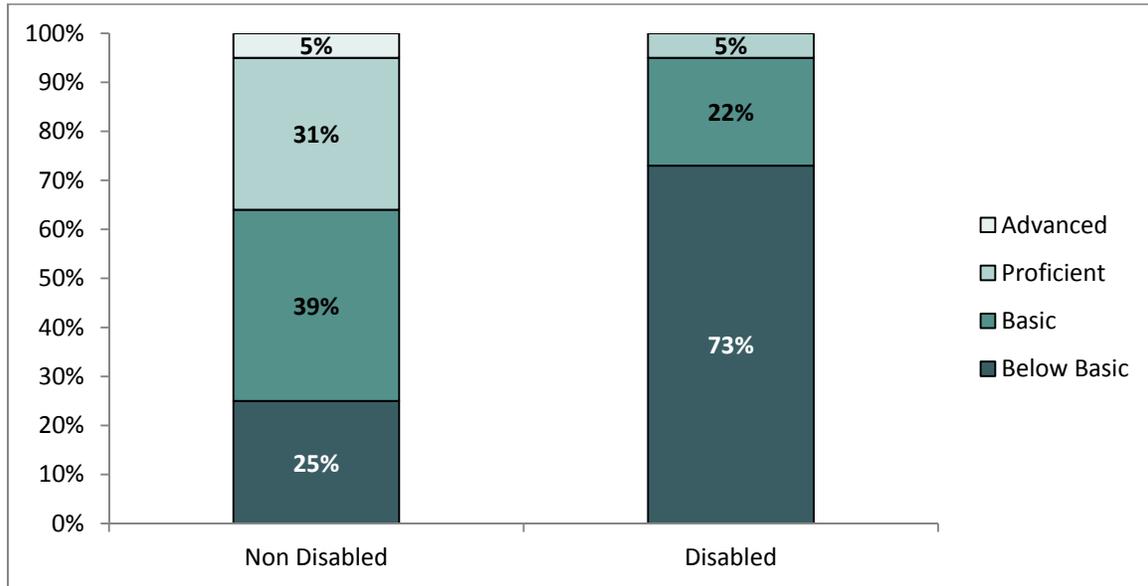


Source: U.S. Department of Education[34]

The University of Massachusetts' Donahue Institute conducted an ongoing study about effective practices for special needs students, particularly in Massachusetts' urban settings, an update to which was published in 2004.[35] Although the first phase of the study used a quantitative data analysis, this second phase of the report was purely qualitative and relied on a cross-case analysis of site visits and in-depth interviews at 10 schools in five districts, including 140 school personnel. The study was largely limited to elementary and middle school students. Researchers emphasized that "there is no single blueprint for advancing the achievement of students with special needs in socio-economically complex urban areas."

Nevertheless, according to Rachel Quenemoen, the National Center on Educational Outcome's Technical Assistance and Dissemination Leader, several schools within this study experienced a "dramatic closing of the achievement gap. Urban districts and schools were seeing better-than-expected achievement among students with disabilities." Although each special education student and program is unique, these successful schools shared the following eleven characteristics in their approach to educating students with disabilities:[36]

- **A pervasive emphasis on curriculum alignment with the state framework.**

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[34] Chart taken verbatim from: Kosiewicz, Op. cit.

[35] Ellis, S. et al. "A Study of MCAS Achievement and Promising Practices in Urban Special Education Summary of Field Research Findings." The University of Massachusetts Donahue Institute, October, 2004.
http://www.donahue.umassp.edu/docs/exec_summary_field_rsrch_findings

[36] Quoted text is based on commentary from Rachel Quenemoen, a Senior Researcher at the National Center on Educational Outcomes, verbatim from: "Just What Did You Expect? Students with Disabilities and the Achievement Gap." *Special Edge*. 21:2, 2008.
http://www.calstat.org/publications/article_detail.php?a_id=92&nl_id=12

- **Systems to support curriculum alignment.** There were "people present in the school whose job it was to support fidelity of implementation; to help teachers who had never done standards-based instruction."

- **An emphasis on inclusion and access to the general education curriculum.** The schools carefully planned "how kids were included in the content. Students were included in meaningful ways in a community of students their own age, and special education teachers worked with general education teachers who knew the content.

- **Culture and practices that support high standards and students achievement.** Everyone at these schools, from bus drivers and cooks to teachers and superintendents, is on the same page. All adults were there to "help every child learn—and learn to high levels."

- **Well-disciplined academic and social environments.** These schools expected the students to behave and had systematic, school-wide approaches for ensuring appropriate behavior. With proactive behavioral management techniques, students were not behaving in ways that interfered with their own learning—or other students' learning.

- **The use of student assessment data to inform decision making.** These schools "didn't rely on large-scale, state-wide assessments to get their data. They used formative assessments; their teachers talked about data and about student work."

- **Unified practice supported by targeted professional development.** These schools had mentoring systems in place to help teachers implement the programs, strategies, and approaches they had learned.

- **Access to targeted resources to support key initiatives.** These schools "used their data to figure out where things were working and where they were not. They developed their training and their support to coach people so that [their own] problem areas could be addressed."

- **Effective staff recruitment, retention, and deployment.**

- **Flexible leaders and staff working effectively in a dynamic environment.** The leaders in these schools "welcome change."

- **The determination that effective leadership is essential to success.**[37]

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[37] Bulleted items taken verbatim from: "Just What Did You Expect? Students with Disabilities and the Achievement Gap." Special Edge. 21:2, 2008. http://www.calstat.org/publications/article_detail.php?a_id=92&nl_id=12 Adapted from: Ellis et al, Op. cit., p. 2.

# SECTION II: PROFILES

In this section of the report, we explore several types of interventions designed to increase student achievement and engagement more generally, although a particular focus is placed on the student types examined in the previous section, when applicable. Figure 2.1 provides an overview of the organization of this section, which profiles approaches that target three levels of support for underachieving students: the classroom, the school, and the greater community. Echoing the sentiments of Dr. Murphy, effective progress to close achievement gaps must be nuanced and address both academic and environmental factors; thus, districts should consider a combination of the following initiatives, including those mentioned in the previous section, instead of searching for one "silver bullet."

**Figure 2.1: Structure of Section II**
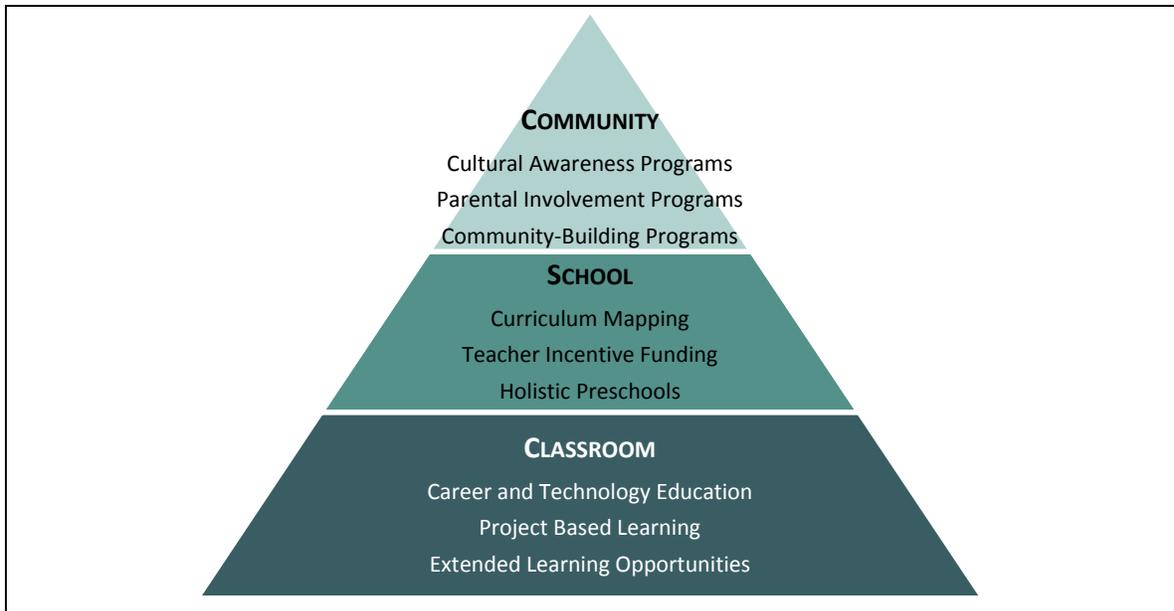


These particular strategies were highlighted based on recommendations from the National Educational Association (NEA) regarding best practices for closing student achievement gaps.[38] The NEA has conducted a review of strategies that may be implemented by districts and schools to address achievement gaps. According to its report, districts should begin by examining data regarding the achievement levels of its students and the gaps in achievement between groups of students. The conclusions drawn from this assessment can lead to a variety of strategies and practices, as outlined in Figure 2.2. For each of these interventions, we have provided an overview of research and literature pertaining to effectiveness in closing achievement gaps and have included case studies showing how

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[38] "Strategies for Closing the Achievement Gaps." The National Education Association. [Excerpted from: Closing Achievement Gaps: An Association Guide (NEA), 2006, pp 18-19.]  http://www.nea.org/home/13550.htm

these approaches have been implemented by schools and school districts to help improve achievement among minority and low-income students.[39]

**Figure 2.2: Strategies for Closing Achievement Gaps**

| **Enhanced Cultural Competence** | **Comprehensive Support for Students** |
|---|---|
| <ul><li>Consider students' diversity to be an asset</li><li>Increase faculty's cultural competence</li><li>Be sensitive to students' home cultures</li><li>Understand and capitalize on students' culture, abilities, resilience, and effort</li></ul> | <ul><li>Screen children early for medical/social services</li><li>Work with medical, social services, and community agencies</li><li>Identify students who need additional instructional support</li><li>Support students via mentors, tutoring, peer support networks, and role models</li></ul> |
| **Outreach to Students' Families** | **Classrooms that Support Learning** |
| <ul><li>Make sure the main office is family friendly</li><li>Engage/reach out to students' families</li><li>Establish family centers at schools</li><li>Hire staff who speak families' home languages</li><li>Provide transportation</li><li>Conduct adult education and parenting courses</li></ul> | <ul><li>Use varied strategies to instruct diverse learners</li><li>Use test and other information on students' performance in instructional planning</li><li>Target literacy and math instruction, if needed</li><li>Safeguard instructional time</li><li>Use research and data to improve practice</li></ul> |
| **Supportive Schools** | **Strong District Support** |
| <ul><li>Make closing gaps a schoolwide responsibility</li><li>Set high expectations and provide rigorous, deep curricula</li><li>Focus on academics</li><li>Provide safe, orderly learning environments for students and educators</li><li>Use test data and other research on students' performance to inform instruction</li><li>Identify strategies to increase achievement</li><li>Develop effective schoolwide leadership teams</li><li>Provide ongoing professional development</li></ul> | <ul><li>Make closing achievement gaps a district priority</li><li>Develop an effective leadership team</li><li>Provide additional resources and support for students experiencing achievement gaps</li><li>Decrease class sizes</li><li>Provide schools with timely test and other assessment information</li><li>Involve teachers in the design of ongoing professional development</li><li>Disseminate the latest research on effective strategies to schools</li></ul> |
| **Adequate Resources and Funding** | **Extended Learning Opportunities** |
| <ul><li>Seek adequate and equitable funding</li><li>Target resources on closing the gaps</li><li>Expand school capacity via additional resources</li><li>Engage businesses, universities, foundations in schools' work</li><li>Seek federal, state, or private funding to leverage NEA programs</li></ul> | <ul><li>Institute full day kindergarten and pre-kindergarten</li><li>Extend learning to before- and after-school programs as well as summer programs</li></ul> |
| **Access to Qualified Staff** ||
| <ul><li>Recruit, develop, and retain qualified teachers</li><li>Attract high quality staff to work with students with the greatest needs</li><li>Compensate teachers who take on extra responsibilities</li><li>Provide time for faculty to meet and plan</li><li>Provide continuous professional development</li><li>Prepare teacher leaders to be knowledgeable and effective on school reform</li><li>Help teachers work effectively with families and communities</li></ul> ||

Source: The National Education Association[40]

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[39] Note: Holistic Preschools were instead profiled, although briefly, in the previous section as a promising approach to closing SES-based student achievement gaps.

## EXTENDED LEARNING OPPORTUNITIES

In an effort to close achievement gaps, many districts with large concentrations of low-income students have looked to extend the learning time offered to students, either through comprehensive school reforms that lengthen the school day or school year, or through the establishment of academically-focused after-school, before-school, intersession and summer programs. Such learning opportunities "provide a means of reaching students that regular [school-time] programs are not effectively serving and can be beneficial in schools' efforts to narrow achievement gaps and guide at-risk students to succeed academically."[41]

Particularly, extended learning opportunities (ELOs) have appeared to have a positive impact on various conditions associated with poor achievement among certain groups, such as "low expectations by teachers, students' alienation from school, lack of enrichment activities, and poor quality education." [42] These programs provide many students characterized by poor academic achievement with:

- Learning opportunities and experiences that are available to most middle and upper class students;

- Experiences that broaden their horizons, build on their interests and skills, facilitate positive relationships with adults and peers; and

- [A] link to classroom expectations.[43]

According to the Council of Chief State School Officers (CCSSO), research has found that ELOs are associated with gains in student performance and engagement, as well as improvements to study habits.[44] In 2007, a joint study from the University of California – Irvine, the University of Wisconsin – Madison, and Policy Studies Associates found that elementary students who participated in "high quality afterschool programs recorded higher mathematics scores than peers who experienced less adult supervision."[45] The same researchers also found that students participating in ELOs developed greater work-study habits than their peers and "show increases in persisting with tasks, paying attention in

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[40] Table contents quoted verbatim from: "Strategies for Closing the Achievement Gaps," Op. cit.

[41] Forbes, R. "Additional Learning Opportunities in Rural Areas: Needs, Successes, and Challenges." Center for American Progress, April 2008, p. 4. http://americanprogress.org/issues/education/report/2008/04/04/4222/additional-learning-opportunities-in-rural-areas/

[42] Miller, B. "Critical Hours: Afterschool Programs and Educational Success." Nellie Mae Education Foundation, May 2003, p. 10. http://www.nmefoundation.org/getmedia/08b6e87b-69ff-4865-b44e-ad42f2596381/Critical-Hours?ext=.pdf

[43] Ibid.

[44] "The Quality Imperative: A State Guide to Achieving the Promise of Extended Learning Opportunities." The Council of Chief State School Officers and the National Governors' Association, 2009. www.nga.org/Files/pdf/0904ELOQUALITYIMPERATIVE.PDF

[45] Vandell, D., Reisner, E., & Pierce, K. October "Outcomes linked to high-quality afterschool programs: Longitudinal findings from the study of promising afterschool programs." University of California–Irvine, University of Wisconsin–Madison, and Policy Studies Associates, Inc. 2007, p. 2. http://www.nccap.net/media/pages/_NDLHIllPromisingPracticesReportfinal1.pdf

class, following directions, completing classroom assignments on time, and completing homework."[46]

However, ELOs should not be considered a silver bullet to reducing achievement gaps, as there is debate as to the degree of effectiveness of this approach. Several recent studies and articles indicate that increased instructional hours are not necessarily correlated to higher student achievement.[47] Some critics have expressed concern that focusing singularly on instructional time may detract from other factors that more significantly impact learning, such as instructional quality. These concerns indicate that in order for ELO initiatives to be successful, they must be predicated on significant meaningful planning and reliable and sustainable funding sources.[48]

### NASHVILLE CLASSICAL CHARTER SCHOOL

Located in Nashville, Tennessee, Nashville Classical Charter School opened in 2012. It had an estimated total enrollment of 162 students in grades K-1 in the 2013-2014 year. Ultimately, Nashville Classical will serve students in grades K-8; however, its current development plan involves adding one grade level per year. Each student belongs to a homeroom named after a prestigious university such as Harvard and Vanderbilt.

**Figure 2.3: Sample "A" ELO Schedule for Harvard Homeroom**

| TIME | ACTIVITY | TIME | ACTIVITY |
|---|---|---|---|
| 7:30-7:45 | Arrival and Optional Breakfast | 12:30-1:15 | Writing |
| 7:45-7:55 | Morning Rhetoric | 1:15-1:55 | Lunch & Recess |
| 7:55-8:05 | Morning Classroom Meeting | 1:55-2:30 | Enrichment (Art, Music, or PE) |
| 8:05-8:35 | Read Aloud | 2:30-2:40 | Break and Bathrooms |
| 8:35-9:15 | Math Block I | 2:40-3:15 | Social Studies/Science |
| 9:15-10:00 | Math Block II: | 3:15-3:45 | DEAR Time and Tutoring |
| 10:00-10:45 | Literacy Rotations pt. 1 | 3:45-3:55 | End of Day Rhetoric |
| 10:45-11:00 | Break, Snack, Bathroom | 3:55-4:00 | Pack Up and Dismissal |
| 11:00-12:30 | Literacy Rotations pt. 2 | 4:00-5:00 | Teacher Meetings and Additional Planning time |

Source: Metropolitan Nashville Public Schools[49]

Primary grades have an "A" schedule or a "B" schedule, which allows for 1.5 FTE teachers for every set of two classrooms. Figure 2.3 provides an example of a typical schedule. All literacy instruction is provided by two teachers in a classroom who work with small groups of nine students while the third group of nine students work at individualized computer

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[46] "The Quality Imperative, Op. Cit., 9.

[47] [1] Silva, E. "On the Clock: Rethinking the Way Schools Use Time." Education Sector and The Broad Foundation, January 2007. http://www.educationsector.org/sites/default/files/publications/OntheClock.pdf
[2] Grant, J. "What New Research On Extended School Day Says." *The Washington Post,* The Answer Sheet, April 19, 2012. http://www.washingtonpost.com/blogs/answer-sheet/post/what-new-research-on-extended-school-day-says/2012/04/18/gIQAnmV3RT_blog.html

[48] "Education Should Take Additional Steps to Enhance Accountability for Schools and Contractors." Government Accountability Office, April 2012, http://www.gao.gov/assets/600/590054.pdf

[49] Ibid., p. 62.

based literacy stations. Literacy Rotations can run with complimentary schedules across the two classrooms.[50] Staff are ensured 165 planning minutes per day and administrators and office staff supervise all breaks, lunches, and recesses.

It is important to note however, that indications from Nashville Classical corroborate findings that ELO initiatives appear to be **most authentic as an organic solution to time limitations hampering academic opportunities, not an end in and of themselves.** For example, Charlie Friedman, the director of Nashville Classical stated, "We didn't start by saying we have to have an extended day, and we didn't start by saying we have to end at 4:00 p.m."[51] Instead, Friedman considered the benefits of offering recess, physical education, three hours of literacy, hands-on science, and a foreign language every single day, which shaped his school's schedule for his school, not the other way around.[52] According to teachers at Nashville Classical, "**extended school days can work, but only if the extra time is used effectively.** If the hours at school seem wasted, students, families, and teachers don't get invested—their buy-in is crucial."[53]

## PROJECT-BASED LEARNING

Project-based learning (PBL), also known as inquiry-based learning or problem-based learning, is a "pedagogical approach that invites students to explore academic content by posing, investigating, and answering questions."[54]

PBL is designed to make student inquiry a central component of the curriculum and place as equal a value on "component skills of research  as on learning content."[55] PBL also tends to require teachers to take on unconventional and demanding new roles, as traditional instructional activities are replaced with guided activities that "provoke students' thinking and curiosity."[56] The goal of this approach is to instill students with long-lasting learning habits that will serve them throughout their lives.

Research on outcomes related to PBL has shown that the approach can have a strong impact on the academic performance of all students. In 2003, a study of over 1,400 students and 64 classrooms across five states showed that an inquiry-based approach in middle school and high school led to improved language arts performance for students at all

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[50] Taken nearly verbatim from: "A Proposed Metropolitan Nashville Public Schools Charter School Application for Charter." Metropolitan Nashville Public Schools, April 2, 2012, p. 61.
http://www.mnps.org/AssetFactory.aspx?did=70560
[51] Riggs, L. "Kids Who Spend All Day at School." *The Atlantic*, May 30, 2014.
http://www.theatlantic.com/education/archive/2014/05/extended-school-days/371896/
[52] Ibid.
[53] Ibid.
[54] "Inspired Issue Brief: Inquiry-Based Teaching." The Center for Inspired Teaching, p. 1.
www.inspiredteaching.org/admin/Editor/assets/Inquiry%20Issue%20Brief.pdf
[55] Ibid.
[56] Ibid.

achievement levels.[57] Through classroom observation of these sites, the study concluded that "discussion-based inquiry approaches were significantly related to improved student performance," and this was true across students of varying literacy levels, both genders, socio-economic statuses, races, and academic abilities.[58]

According to a 2000 study in the *Journal of Research in Science Teaching*, the implementation of a PBL approach in middle school has proven to raise student enthusiasm in learning, improve the academic achievement levels of African American students, and narrow the gap in achievement between males and females.[59] These outcomes, as described by the Center for Inspired Teaching, arose from a statewide professional development initiative in Ohio designed to promote greater emphasis on inquiry-based techniques:

> In each of eight urban middle schools that were studied, students of teachers who participated in inquiry workshops outperformed students of teachers who did not receive the training. Not only did inquiry-based techniques raise student achievement scores overall, but score differences between female and male students were less evident in the classes taught by teachers who used the inquiry approach. Finally, students in the inquiry-based classrooms reported being more interested in the subjects they studied.[60]

In general, research shows that students in PBL programs experience gains in factual learning equal to or greater than those receiving traditional forms of instruction.[61] For instance, students learning through PBL retain content longer and have a more nuanced understanding of subjects.[62] In addition, a three-year study that compared one secondary school that used PBL to another that used traditional instruction found that students receiving PBL instruction did better both on math problems requiring analytical thought and those requiring memorization of a formula.[63] Multiple studies have found that students in PBL demonstrate superior critical thinking skills.[64] The benefits also extend beyond measurable academic achievement: PBL has been found to improve students' ability to collaborate and resolve conflicts,[65] as well as to imbue students with higher motivation and confidence.[66]

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[57] Applebee, Arthur N., Judith A. Langer, Martin Nystrand and Adam Gamoran. "Discussion-Based Approaches to Developing Understanding: Classroom Instruction and Student Performance in Middle and High School English." American Educational Research Journal 40 (3), 2003, pp. 685-730.

[58] "Inspired Issue Brief: Inquiry-Based Teaching," Op. Cit., 3.

[59] Kahle, J. B., J. Meece, and K. Scantlebury. 2000. "Urban African-American middle school science students: Does standards-based teaching make a difference?" *Journal of Research in Science Teaching* 37 (9):1019-1041.

[60] "Inspired Issue Brief: Inquiry-Based Teaching," Op. Cit., 3.

[61] Barron and Darling-Hammond, Op. Cit., p. 1

[62] [1] Ibid.
[2] "Research Summary: PBL and 21st Century Competencies." Buck Institute of Education. http://bie.org/object/document/research_summary_on_the_benefits_of_pbl

[63] Ibid.

[64] "PBL Research Summary: Studies Validate Project-Based Learning," Op. cit.

[65] Ibid.

[66] Barron and Darling-Hammond, Op. Cit., p. 1

Proponents of PBL also emphasize that this instructional approach aligns well with Common Core requirements. For instance, standard assessments based on the Common Core State Standards are expected to emphasize the application of knowledge rather than factual recall, and the demonstration of knowledge is a key component of PBL. In particular, Common Core math standards emphasize real world practice, which PBL also highlights through its use of authentic questions and problems.[67]

### DETROIT PUBLIC SCHOOLS (MICHIGAN)

Students in Detroit Public Schools are among the nation's lowest-achieving. As described by Teach for America, "only 3 percent of Detroit's fourth-graders and 4 percent of its eighth graders meet national math standards."[68] Test scores indicate that the problem is so great in Detroit that only one-third of grade 4 students in the district can "subtract 75 from 301, even when given a choice of three multiple-choice answers. The school district is the largest in Michigan, serving about 160,000 students, a population that is 91 percent African American, 5 percent Hispanic, and 69 percent eligible for free or reduced-price lunch.[69]

The district has embarked on large-scale reform effort in which it has partnered with the University of Michigan's Center for Learning Technologies in Urban Schools (LeTUS) to address its achievement problems. Part of this initiative has been the implementation of "project-based inquiry science units supported by aligned professional development and learning technologies."[70]

Using learning outcomes based on state and national standards, an "inquiry science curriculum" was created by the district and aligned with its own curricular framework. The adapted curriculum included several "units"  lasting eight to 10 weeks, in which students participated in "inquiry investigations contextualized by driving questions."[71]

The inquiry units incorporated into the curriculum were described in a 2008 study:

- **What Is the Quality of Air in My Community?** This unit focuses on factors that affect air quality to build understanding of the particulate nature of matter and chemical and physical properties. Learners examine different sources of pollution in their neighborhood and use archived data to compare air quality in Detroit with that of other cities.

- **What Is the Water Like in My River?** In the context of exploring local ecology, learners construct an integrated understanding of science concepts such as watersheds, erosion and deposition, and chemistry concepts such as pH and dissolved oxygen.

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[67] "PBL, Common Core and Next Generation Science Standards." Buck Institute of Education.
http://bie.org/object/document/pbl_common_core_and_nextgen_standards
[68] "Detroit." Teach for America. www.teachforamerica.org/the-corps-experience/placement-regions/detroit/
[69] Geier, R., et. al. "Standardized Test Outcomes for Students Engaged in Inquiry-Based Science Curricula in the Context of Urban Reform." Journal of Research in Science Teaching, 45:8; p. 925.
http://deepblue.lib.umich.edu/bitstream/handle/2027.42/61206/20248_ftp.pdf&embedded=true?sequence=1
[70] Ibid. p. 922.
[71] Ibid. p. 926.

- **Why Do I Need to Wear a Helmet When I Ride My Bike?** While exploring the nature of collisions in a real-world context, learners develop an understanding of force, velocity, acceleration, and Newton's Laws. Learners also develop strategies for interpreting and visualizing physical phenomena graphically.[72]

While exploring these questions, students also incorporated learning technologies and developed "artifacts to demonstrate understanding."[73] Teachers were able to revise units each year based on their experience with the curriculum and student performance. In addition, a new professional development initiative was implemented to prepare teachers for the integration of the project-based inquiry model, with activities that included "week-long summer institutes, monthly Saturday workshops, teacher discussion groups, online resources, and limited classroom support by graduate students and peer teachers." These offerings were aligned to teacher feedback and student performance.

The 2008 study examining the effectiveness of this new approach observed standardized tests results of two grade 7 and grade 8 student cohorts as compared to rest of the district's students.[74] It found that participation in the inquiry-based units was generally associated with higher scores, and concluded that a "standards-based, inquiry science curriculum" can result in gains in achievement when districts ensure that the curriculum is "highly specified, developed, and aligned with professional development and administrative support."[75]

### FOXFIRE HIGH SCHOOL (OHIO)

Foxfire High School (FHS), located in Zanesville, Ohio, operated by a dropout recovery district, serves at-risk youth in its five surrounding counties.[76] Foxfire School recovery district is very small, with a total enrollment of 278 in the 2010-2011 school year.[77] In this school year, FHS student enrollment was comprised of students who were 80 percent white, 12 percent multiracial, 7 percent African-American, 69 percent free or reduced lunch, and 28 percent special education learners.[78] Their motto pledges to "teach the unteachable, reach the unreachable, and provide hope to all of [its] students."[79]

Its accomplishments include recognition as a "School of Promise" by the Ohio Department of Education and "Model Alternative School" by the United States Department of Education, as well as founding a student scholarship fund.[80] In 2013, the National Dropout Prevention

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[72] Bulleted items taken verbatim from: Ibid.
[73] Ibid.
[74] Ibid., p. 922.
[75] Ibid.
[76] "Foxfire High School." National Dropout Prevention Center/Network.
    http://www.dropoutprevention.org/modelprograms/show_program.php?pid=264
[77] "Foxfire Center for Student Success." National Center for Educational Statistics, ELSI.
    http://nces.ed.gov/ccd/elsi/quickFacts.aspx
[78] "Foxfire Schools Zanesville, Ohio." The National Evaluation and Technical Assistance Center, October, 2012, p. 1.
    http://www.neglected-delinquent.org/sites/default/files/docs/ProgHighlights_Foxfire.pdf
[79] "Enrollment." Foxfire Schools. http://foxfire.schoolwires.com/domain/35
[80] "History of Foxfire." Foxfire Schools. http://foxfire.schoolwires.com/Page/10

Center/Network selected FHS as a model alternative high school.[81] FHS imagines itself as a "trendsetting model dropout recovery school district filled with innovative instructional practices and unique programming that addresses the whole child to cultivate student success."[82] PBL is its preferred method by which to offer programming that accommodates the individual needs of their students.[83]

The Foxfire Schools program began in the 2000-2001 school year with a staff of three and an enrollment of 10. Over the following three years, FHS grew into a full time, independent program with 40 graduates.[84] Between 2005 and 2006, it implemented a PBL structure. Graduation rates increased from 64 percent to 97 percent between 2004 and 2008, and by 2011 the program graduated 127 students.

Incoming students are assessed based on their current academic, social-emotional, and physical wellness or status, the results of which inform the design of students' individual academic plans.[85] There is an initial emphasis on the core subject areas and students must gain credits or pass state graduation tests in these areas before progressing into the PBL program.[86] FHS's PBL project offerings cover a variety of engaging topics, including the History of Rock 'n Roll, Sports and Math, and R U Still Down, a course about rapper Tupac Shakur. Teachers individually determine credits for each project, and students select projects that match their interests; however, teachers ultimately provide guidance to students to ensure that they complete appropriate projects to fulfill their requirements.[87] Teachers are shifting increasing focus on the development of interdisciplinary projects for students, allowing them to earn credits toward multiple credit requirements.[88]

FHS has several layers of support at both the internal and external levels. The principal leads daily 30-minute professional learning seminars, which provides teachers with an opportunity to share and gain wisdom from their colleagues regarding the following topics: curriculum mapping, assessment mapping, differentiated instruction/project-based learning, wellness, and intervention.[89] Additionally, FHS maintains relationships with a 15 partner organizations, including Big Brothers/Big Sisters, a local American Legion Post, several youth and community centers, several local religious organizations, a variety of arts and cultural organizations, and country adult and juvenile court systems, to engage the students in service projects.[90]

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[81] "Foxfire High School," Op. cit.
[82] "What Makes Us Different?" Foxfire Schools. http://foxfire.schoolwires.com/domain/3
[83] Ibid.
[84] "History of Foxfire," Op. cit.
[85] "Foxfire Center for Student Success." Doing What Works Clearinghouse.
    http://www.cde.state.co.us/sites/default/files/documents/dropoutprevention/resources/dwwfoxfire.pdf
[86] Ibid.
[87] Ibid., p. 3.
[88] Ibid., p. 5.
[89] "Foxfire Center for Student Success." Doing What Works Clearinghouse, Op. cit.
[90]  [1] "Foxfire High School," Op. cit.
    [2] "Foxfire Center for Student Success," Op. cit., p. 3.

## CAREER AND TECHNOLOGY EDUCATION

Career and Technology Education, or Career and Technical Education (CTE), is a curricular approach applied in high schools, career centers, community and technical colleges, and other educational institutions to prepare students and adults for focused career paths.[91] CTE typically begins at the high school level, at which point students are given the opportunity to choose a program of study and take courses to obtain skills and real-world knowledge that translate directly to the workplace.[92] Generally, successful CTE programs incorporate a wide variety of practical skills integrated with traditional classroom instruction.[93] CTE programs focus on a variety of subject areas, particularly those in high economic demand, such as health care, advanced manufacturing, and technology.[94] Additionally, programs are frequently organized into career clusters that mirror the National Association of State Directors of Career Technical Education Consortium's (NASDCTEc), National Career Clusters Framework:

- Agriculture, Food & Natural Resources
- Architecture & Construction
- Arts, A/V Technology & Communications
- Business Management & Administration
- Education & Training
- Finance
- Government & Public Administration
- Health Science

- Hospitality & Tourism
- Human Services
- Information Technology
- Law, Public Safety & Corrections
- Manufacturing
- Marketing
- STEM
- Transportation, Distribution & Logistics[95]

In its 2012 report, "Investing in America's Future: A Blueprint for Transforming Career and Technical Education," the U.S. Department of Education identified CTE as a crucial component to strengthening the U.S. education system and laying the foundation for strong economic growth. Like other initiatives that aim to close achievement gaps, CTE is time and resource intensive, and the most successful programs require district and school collaboration with business, industry, and educational partners. In fact, the USDOE stated that these partnerships are "essential to creating high-quality CTE programs."[96] With this renewed focus and development, the technical education system, "once stereotyped as a dumping ground for those less academically- inclined […] has transformed itself to a system

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[91] "What is CTE?" Association for Career and Technical Education (ACTE). https://www.acteonline.org/cte/

[92] Holzer, H., D. Linn, and W. Monthey. "The Promise of High-Quality Career and Technical Education." College Board, October 2013, p.2. http://www.careertechnj.org/wp-content/uploads/2013/11/Georgetown.BR_.CB-CTE-report-11.2013.pdf

[93] Investing in America's Future: A Blueprint for Transforming Career and Technical Education." U.S. Department of Education, Office of Vocational and Adult Education, April, 2012. p. 1. http://www2.ed.gov/about/offices/list/ovae/pi/cte/transforming-career-technical-education.pdf

[94] Ibid.

[95] Bulleted items taken verbatim from: "Career Clusters." National Association of State Directors of Career Technical Education Consortium. http://www.careertech.org/career-clusters

[96] "Investing in America's Future: A Blueprint for Transforming Career and Technical Education." Op. cit., p. 8.

that offers rigorous, relevant, real-world instruction with positive outcomes and impact on student achievement."[97]

Despite CTE's potential to narrow achievement gaps, there is not an overwhelming body of research that investigates its effects on increasing the performance of the previously-discussed disadvantaged student groups. A brief prepared by the National Association of State Directors of Career Tech Education cites statistics that indicate between 1996 and 1999, minority students enrolled in High Schools That Work programs increased their math performance by 20 points on average; however, the details of this study are very vague.[98]

A more credible study, although not specifically focused on CTE's impact on achievement gaps, investigated the concern that CTE may "[steer] participants into a one-track career path and [narrow] their scope of educational possibilities."[99] This is a particular concern for those considering the CTE initiatives that target already underprivileged students. This empirical study provided evidence that partially resolves those worries. Researcher Robert Bozick of Johns Hopkins University examined the post-high school paths of graduates of a manufacturing focused School-to-Career (STC) program and a comparable group of traditionally-instructed students. The findings indicate that "STC graduates are more likely to work in and have career goals that are aligned with the STC program sponsor, yet have higher post-secondary enrollment rates, greater educational expectations, and are better prepared for the transition to young adulthood."[100]

A PhD candidate at California State University – Fullerton studied the impact of health and media CTE programs on a high-minority urban school district. He was particularly interested in both CTE's effect on student achievement, GPA, credit completion, and attendance, as well as the relationship between time spent in CTE programs and students' achievement. Results from a multiple regression analysis concluded that "participation in Career Technical Education significantly impacts grade point average and credit completion rates."[101] The amount of time students spent in CTE programs correlated only with students' GPAs.[102] It is important to note that this sample contained a large majority of male students, which is representative of gender distribution in the media-focused CTE program in question, as well as similar national CTE programs' enrollment trends. (The opposite pattern arises in health-focused career academies, for instance.)

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[97] "Already At the Top: CTE Programs Show Positive Impact on Student Achievement." National Association of State Directors of Career Technical Education Consortium, May, 2010. p. 1. http://careertech.org/sites/default/files/AlreadyattheTop-CTEProgramsShowPositiveImpact-URBAN-May2010.pdf

[98] "Back to School: Career Tech101." National Association of State Directors of Career Technical Education Consortium, 2002, p. 3. http://www.cvsd.org/documents/CTE/CTE%20101.pdf

[99] Bozick, R and K. MacAllum. "Does Participation in a School-To-Career Program Limit Educational and Career Opportunities?" Journal of Career and Technical Education, 18:2, 2002, http://scholar.lib.vt.edu/ejournals/JCTE/v18n2/bozick.html

[100] Ibid.

[101] San Miguel, M. "The Effects of Career Technical Education on Student Outcomes in A High-Minority Urban School District." California State University – Fullerton, 2013, p. iv. http://media.proquest.com/media/pq/classic/doc/3145466711/fmt/ai/rep/SPDF?_s=KCCBHMihMR5EmUQjdcwi N1%2BxQFw%3D

[102] Ibid., p. v.

## JACK E. SINGLEY ACADEMY SCHOOL OF LAW & PUBLIC SERVICE (TEXAS)

Located in Irving, Texas, the Jack E. Singley Academy School of Law and Public Service (The Singley Academy) served 200 students in 2013 and will experience a 200 percent increase in enrollment in the 2014-2015 school year. Of its 2013 students, 86 percent were identified as low-income.[103] Unlike other CTE programs in engineering or healthcare, this Law & Public Service-focused program had a roughly even distribution of male (52 percent) and female (48 percent) students. In 2014, The Singley Academy was recognized by the NASDCTEc as an Excellence in Action Award winner for its innovative approach to CTE.[104] Its results have been overwhelmingly positive: 97.7 percent of students successfully graduated and an equal percentage earned an industry-recognized credential. Seventy-seven percent of students went on to enroll in post-secondary institutions, while the remaining 23 percent entered the workforce or military.

The Singley Academy aims to "increase students' achievement through engaging partnerships between the school, parents, and the community." [105] Its complementary goals of "giving students hands-on learning and stimulating a passion for service by offering firsthand experiences in a diverse array of pathways" could not be possible without the deep partnerships it has formed with a variety of organizations: the City of Irving Police Department, the county and municipal court systems, a hospital, fire department, and two local colleges.[106]

In 2013, in anticipation of a substantial increase in enrollment, the Singley Academy strategically assembled an advisory committee comprising representatives from the Dallas County District Attorney's Office, the Irving Police and Fire Departments, U.S Air Marshalls, and the greater CTE community to revitalize and broaden its Legal Services program.[107] The guidance of this committee fundamentally shaped the resulting School of Law and Public Service, which has the following qualities/resources:

- Dual-credit in **Criminal Justice** through seminars led by police officers
- An expanded, dual-credit **EMT program**, including a Firefighter Academy
- **Homeland Security** and **Digital Forensics** programs of study
- **A Jail Internship program** (25 hours per week) that immerses students in the operations of a correctional facility, working in support roles without contact with inmates
- **Courtroom Observation program** which allows students interested in law to witness the eventual outcomes of their pathway

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[103] "Jack E. Singley Academy School of Law and Public Service." National Association of State Directors of Career Technical Education Consortium, 2014, p. 1.
http://careertech.org/sites/default/files/Singley%20Two%20Pager.pdf

[104] "Excellence in Action: 2014." National Association of State Directors of Career Technical Education Consortium.
http://www.careertech.org/excellence-action

[105] "Jack E. Singley Academy School of Law and Public Service," Op. cit., p. 1.

[106] Ibid.

[107] Ibid., p. 2.

- Preparation for the Physical Abilities Test and the FEMA community Emergency Response Team Certification exam
- Tuition reimbursement for students who work after graduation
- On-site legal and citizenship clinics for community members
- Mock intake simulations to improve communication and writing skills[108]

## TEACHER INCENTIVE FUND

Although there is a degree of controversy surrounding teacher incentive systems and their effectiveness, many local and state education agencies are taking advantage of the government's renewed focus on the issue in order to develop new systems of their own or build upon existing ones. Of the federal programs that are making funds available to support these efforts, the most prominent is the Teacher Incentive Fund (TIF), operated by the office of Academic Improvement and Teacher Quality Programs at the U.S. Department of Education. The goals of the TIF are:

- Improve student achievement by increasing teacher and principal effectiveness;
- Reform teacher and principal compensation systems so that teachers and principals are rewarded for increases in student achievement;
- Increase the number of effective teachers teaching poor, minority, and disadvantaged students in hard-to-staff subjects; and
- Creating sustainable performance-based compensation systems. [109]

These objectives reflect the needs and aims of many school systems, and provide a rough framework for the development of incentive models.[110] Since its creation in 2006, TIF has made hundreds of millions of dollars in five-year grants available to education agencies that develop incentive plans with a performance-related component.[111] These models "must use multiple measures of teacher performance including a measure of student achievement gains, such as a value-added model (VAM)." [112] On three occasions since 2006, the USDOE has awarded TIF grants after competitive grant application processes: in 2007, 2008, and the most recent round in 2010.[113] Recipients of the TIF grant are allowed a specific period of time to "review research, design programs, and deliver initial training" before debuting their

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[108] Bulleted points taken verbatim from: Ibid., p. 2.

[109] Bulleted points taken verbatim from: Douglas, E. "What is TIF & Why Should Your District Care?" *Education Week*, January 22, 2012. http://blogs.edweek.org/topschooljobs/k-12_talent_manager/2012/01/what_is_tif_why_should_your_district_care.html?print=1

[110] Ibid.

[111] "Teacher Incentive Fund: Funding." U.S. Department of Education. http://www2.ed.gov/programs/teacherincentive/funding.html

[112] Dyke, A, H. Hanson, K. Higgs, and B. Pratt. "Lessons Learned From Oregon Teacher Incentive Fund Districts." The Chalkboard Project, March, 2014. http://chalkboardproject.org/wp-content/uploads/2010/12/Lessons-learned-from-OR-TIF-districts-2.pdf

[113] Ibid.

models at the district level. However, according to a 2012 article in *Education Week*, the previously-allowed planning period was struck from the 2012 TIF stipulations.[114]

There is some debate and ambiguity in the body of research about TIF and performance pay structures as to their effectiveness and impact, and several education authorities have expressed concern about TIF's acceptance. In 2006, the then-president of the National Education Association, Reg Weaver, delivered a harsh critique of the policy, calling it "long on politics and short on substance."[115] He stated that TIF-backed merit-pay programs detrimentally run opposite to the foundational aspects of the teaching profession: "Students learn best when teachers work as a team, not as free agents competing for a financial reward. These grants will promote unhealthy competition in a profession that thrives on teamwork and collaboration."[116]

Another educational authority has investigated pay incentive programs with more of a team focus, however, finding limited effectiveness in one case. The *What Works Clearinghouse* of the Institute of Education Sciences reviewed three studies of New York City's Schoolwide Performance Bonus Program (SPBP). Under the SPBP, schools were awarded progress scores, with the following breakdown: 60 percent yearly student progress, 25 percent increased student achievement on state reading and math exams, and 15 percent measures of the learning environment. Schools that reached 100 percent of their school-level goals could receive lump-sum payments of $3,000 per union teacher; those that reached at least 75 percent of their goals received $1,500 per union teacher.[117] A meta-analysis of the studies' findings concluded that the merit-pay program failed to improve student achievement and did not significantly increase teacher retention.[118]

On the other hand, according to a study conducted and published in 2014 by ECONorthwest and Education Northwest, five districts in Oregon were awarded TIF grants and, through the guidance of The Chalkboard Project, experienced positive results, having "discovered how to leverage high-quality evaluations and continuous professional learning." **Gains in overall student performance were positive; however, these improvements were even more prominent among districts' disadvantaged students, indicating that TIF was effective in narrowing achievement gaps.**[119] In the three years following the 2010-2011 school year, these students experienced an average composite gain in math proficiency of 6 percentage points and 8 points in reading. Disadvantaged students in non-TIF districts across Oregon State "saw their math proficiency decline by 1 percentage point and reading proficiency improve by only 3 points."[120]

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[114] Zubrzycki, J. "Big-City Districts Bail on Teacher-Incentive Grants." *Education Week,* August 21, 2012, http://www.edweek.org/ew/articles/2012/08/22/01tif_ep.h32.html

[115] Honawar, V. "Many Teacher Incentive Fund Applications Rejected." *Education Week,* October 31, 2006. http://www.edweek.org/ew/articles/2006/11/01/10tif.h26.html

[116] Ibid.

[117] "New York City's Schoolwide Performance Bonus Program." The What Works Clearinghouse http://ies.ed.gov/ncee/wwc/SingleStudyReview.aspx?sid=174

[118] Ibid.

[119] Dyke, et. al., Op. cit., p. 3.

[120] Ibid.

## BUTLER COUNTY SCHOOL DISTRICT (ALABAMA) – PAYPLUS

Butler County, in rural, south-central Alabama, has one of the highest unemployment rates in Alabama and one of the greatest disparities between socioeconomic groups.[121] Its six public schools have a total enrollment of 3,400 students, over 78 percent of whom receive free or reduced meals and 15 percent of whom are Special Needs students. Butler County has the highest projected dropout rate in Alabama, and a teacher turnover rate of 16 percent.[122]

**The Butler County Board of Education is the only board in the state of Alabama to have successfully implemented a teacher incentive plan with positive results.[123]** PayPLUS, which was created in 2008, originally compensated leadership positions (such as grade level chair or extracurricular activity chair), as well as attendance, school academic achievement, and improvement in school culture.[124] Butler County's TIF proposal, however, describes plans to broaden the program so that it includes incentives for teacher and principal effectiveness, mentoring opportunities for teachers, and grants for collaborative groups, including "groups of teachers who take responsibility for groups of students outside their regular classroom."[125] Further compensation is available to teachers who become National Board Certified. PayPLUS allows participation to some degree by all school employees, including bus drivers and school nurses. Participation, however, is optional.

PayPLUS compensation is awarded each semester. No single PayPLUS bonus is very large, but participants are able to receive multiple bonuses, which can add up to become one large reward. Figure 2.4 displays the structure of the rewards.

PayPLUS was reviewed by Management Analysis and Planning Inc. (MAP) and received generally favorable feedback. Employees were pleased with the voluntary nature of the program and believed it to be fair and equitable.[126] There was disagreement, however, about the perceived impact of the program. While teacher attendance improved and the number of extracurricular offerings and participation at each school rose, there was "no strong evidence that the program was motivating more leadership among teachers, and many were doubtful that it could truly impact school culture."[127]

Despite these doubts, PayPLUS has had a positive effect on Butler County schools in many areas. For example, during the first five months of implementation, there was a 12-21

[121] Butler County Board of Education. "Application for New Grants Under the Teacher Incentive Fund Program. CFDA #84.385A. PR/Award #S385A100075." July 6, 2010. p. e1. http://www2.ed.gov/programs/teacherincentive/apps/a100075.pdf
[122] "Butler County Board of Education (AL)." Center for Educator Compensation Reform, p. 1. http://www.cecr.ed.gov/profiles/pdfs/cohort3/CECR_GP_ButlerCounty.pdf
[123] "Application for New Grants…" Butler County Board of Education, Op. cit., p. e0
[124] Ibid., p. e6.
[125] Ibid.
[126] Ibid., p. e18.
[127] Ibid., p. e20.

percent increase each month over previous years in teacher attendance; a 25 percent increase in the number of extracurricular offerings; and a 32 percent increase in the number of students participating in these extracurricular activities.[128]

**Figure 2.4: PayPLUS Program Teacher Compensation Framework**

| AWARD TYPE | QUALIFICATION(S) |
|---|---|
| School-wide | ▪ The No Child Left Behind Adequate Yearly Progress (AYP) benchmarks are reached (school- and district-level employees are eligible for this bonus), and/or<br>▪ The school attains four of the five following indicators of positive school culture (school-level employees are eligible for this bonus):<br>  1. Reduction of discipline referrals<br>  2. Improvement of student satisfaction<br>  3. Increase in extra-curricular activities<br>  4. Evidence of students' academic growth<br>  5. Expansion of celebration and recognition activities |
| Team | Groups of teachers who apply for a $5,000 Teacher Collaboration Grant and create plans to address specific school objectives |
| Individual | ▪ Contribute to student achievement growth;<br>▪ Take on additional roles and responsibilities, such as being a grade level, department, or committee chair; a teacher mentor; or a sponsor of extracurricular activities;<br>▪ Have perfect attendance for a nine-week period (rewards are cumulative);<br>▪ Achieve individual class success and demonstrate teaching quality;<br>▪ Become Nationally Board Certified; or<br>▪ (For principals) Are demonstrably effective leaders that make positive school culture a priority |

Source: Butler County Board of Education[129]

## CURRICULUM MAPPING

Curriculum Mapping "is a process for recording what content and skills are actually taught in a classroom, school, or district during a longer period of time. The data provide an overview, rather than a daily classroom perspective, of what is actually happening over the course of the school year."[130] Curriculum mapping is an approach that is increasingly used by schools and teachers to construct curricula, address "gaps and overlaps across and within grade levels and content areas, and align curricula with various state and national standards."[131] As described in Getting Results with Curriculum Mapping, this method can help schools formulate an organized, centralized, and coherent approach by "sifting, sorting, aligning,

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[128] Ibid., p. e22.

[129] Ibid.

[130] "Overview of Curriculum Mapping." The Association for Supervision and Curriculum Development, 2001.
http://faculty.njcu.edu/mmaye/EDLDPLAN/cm_overview.pdf

[131] Lucas, R. "Teachers' Perceptions on the Efficacy of Curriculum Mapping as a Tool for Planning and Curriculum Management." Seton Hill University, Doctoral Dissertation, 2005.
http://www.curriculummapping101.com/sites/default/files/Lucas-Article.pdf

and organizing their curricula."[132] In viewing the curriculum more broadly, teachers are able to pinpoint "redundancies" and "misalignments," with the ultimate goal of producing measureable improvement in student performance.[133]

The Utah Education Network highlights several benefits for teachers who use the curriculum mapping approach:

- Mapping curriculum enables teachers to assure that they allocate sufficient time to cover each standard and objective.

- As teachers map out teaching units, cross-curricular connections become more evident and can be intentionally promoted. This enables students to develop real world application for concepts.

- Curriculum maps provide the framework for building teaching units. Some standards and objectives are seasonal and must be taught during the appropriate time of the year. Other standards and objectives are developmental and must be built in sequentially throughout the year.

- As teachers stand back and analyze a curriculum map, teaching strategies become clearer. The teacher is better able to create a balance between teacher-directed concepts and student-generated investigations.

- Grade level planning, exploration tubs, learning centers, and creative drama centers can be correlated using curriculum maps. Kindergarten, first grade, and second grade standards and objectives have common themes, and teachers can benefit from sharing resources, correlating field trips, and building grade level libraries.

- Curriculum mapping can also facilitate assessment planning. Periodic self-assessment and assessment using rubrics promotes awareness of strengths and areas for improvement. Students learn the language and process of setting, recording, and evaluating goals.

- Mapping literature into learning centers promotes an environment that is rich with literacy materials. This provides students with the opportunity to read and write in social, collaborative settings. Well-designed classroom literacy centers significantly increase the number of children who choose to participate in literary activities for both pleasure and information.[134]

In 2001, a study of improved Ohio school districts found that **the most common practice cited by superintendents as being responsible for their improved academic performance was curriculum mapping**. In fact, these participants indicated that curriculum mapping was the single most important factor in improving academic performance, more important than intervention/remediation programs, analysis of performance data, professional

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[132] Jacobs, H. "Getting Results with Curriculum Mapping." ASCD, 2004.
   www.ascd.org/publications/books/104011/chapters/Foreword.aspx
[133] Ibid.
[134] "Curriculum Mapping." Utah Education Network. www.uen.org/k-2educator/currmapping.shtml

development and test preparation.[135] Similarly, a study of 573 teachers and 19 schools in South Carolina found that most teachers viewed curriculum mapping as an effective tool for alignment and long-term planning of the curriculum.[136] While many teachers praise the influence of curriculum mapping as a tool to improve teaching and learning, research is limited in terms of proving a direct relationship between this approach and closing the achievement gap. Rather, in most cases curriculum mapping appears to be a central aspect of multifaceted initiatives aimed improving student achievement.

## CHURCHILL JUNIOR HIGH SCHOOL (ILLINOIS)

Located in Galesburg, Illinois, Churchill Junior High School has seen vast improvements in student performance since 2004, with student achievement scores that have improved to 89 percent proficiency from 69 percent proficiency over a four-year period.[137] Progress is even more evident among low-income students at Churchill, whose math scores have climbed from 32 percent to 80 percent proficiency. As described in a report from the National Education Association's Priority Schools Campaign, Churchill had previously been characterized as an affluent school, but now about half of its roughly 600 students are eligible for free or reduced-price lunches. The school is made up primarily of White students, while about 30 percent of its students are either African American, Hispanic, or multi-racial. The progress at Churchill is credited largely to the actions of new principal Bart Arthur, who made substantial changes to the school's climate, culture, instructional practices, and teacher development.

Before Arthur's arrival, the school had employed "didactic pedagogy, with desks in rows, few signs of student engagement, and very little use of technology."[138] Under the new system, the school allows for "45 minutes daily for teacher team meetings, interdisciplinary units, instructional strategies, parent calls and Response to Intervention meetings." In addition, the Standards Aligned Classroom Training initiative was expanded so that four in five teachers have now been trained in the instructional model. Teachers were also taken to observe exemplary schools that were similar to Churchill and had successfully implemented new practices aimed at closing achievement gaps. In order to improve mathematics instruction, teachers worked tirelessly on curriculum mapping and the coordination and articulation of the curriculum with the elementary and secondary teachers to ensure coverage of the state standards.  In fact, Arthur placed the highest priority on mapping the curriculum, creating daily lesson plans, and ensuring that Churchill's teachers coordinated the curriculum with the district's elementary and secondary teachers.

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[135] Kercheval, A. "A Case Study of Key Effective Practices in Ohio's Improved School Districts: Report of Results from Phase I."  Indiana Center for Evaluation. July 7, 2001, p. 11.
www.indiana.edu/~ceep/projects/PDF/200107_Key_Effec_Prac_Interim_Report.pdf

[136] Lucas, Op. Cit.

[137] House, J. and S. Watkins. "What Worked at Churchill Junior High School in Galesburg, Illinois." The Hope Foundation, June 4, 2010. http://www.hopefoundation.org/nl/0610/articles/June2010-Churchill.html?utm_source=HOPE&utm_medium=JuneNL&utm_campaign=Churchill

[138] Ibid.

However, as detailed by the Priority Schools Campaign, curriculum mapping was only one of many major changes that took place at Churchill. For example, student fighting was reduced drastically as a result of a program designed to incentivize positive behavior, in which "[s]tudents who are observed performing a positive deed are recognized for their actions.[139] The school's security system was also upgraded in order to address school safety and vandalism concerns. Meanwhile, many students benefited from increased access to after-school programs like Teen Reach, SUCCESS, and the Carver Center. They also benefited from a large-scale technology upgrade that included additional computers in labs, a 30-station mobile computer lab, and the installation of several new Smart Boards.

For teachers, a set of new development opportunities were provided, including a book study group that began with administrators and expanded to include all staff. To promote collaboration and mutual development between teachers, professional learning communities were formed among teachers to produce critical inquiry of specific instructional challenges, action research, examination of multiple measures of data, and a results orientation to student achievement.

## EAST MILLSBORO ELEMENTARY SCHOOL (DELAWARE)

At East Millsboro, 30 percent of the students are African American, 10 percent are Latino, and about half of the school's 700 students are eligible for free or reduced-price meals.[140] East Millsboro has been hailed as a prime example of how schools can help disadvantaged students overcome barriers to educational success. In 2005, all grade 3 and grade 5 classes met the state standards in reading, while 98 percent of the grade 3 class and 96 percent of the grade 5 class met the state standards in math. In addition, over 90 percent met the state standards in writing, science, and social studies.[141] Between 1998 and 2005, East Millsboro made significant progress in closing the achievement gap of students of low socioeconomic status. In 2005, "the test scores of fifth-grade readers who [were] low-income [had become] almost indistinguishable from those who [were] not, and East Millsboro's low-income students [outperformed] the rest of Delaware on every measure."[142]

Curriculum mapping has been a central strategy for East Millsboro in attaining such high scores and to closing the achievement gaps of minority students and students of poverty. Its teachers work in grade-level teams to map out and document instructional activities on a month-by-month basis. The strategy "is drawn in part from state standards and contains the performance indicators students must meet during the month plus essential questions, skills, assessments, specialized vocabulary, and texts to be used to teach that unit.[143] The curriculum maps provide new and experienced teachers with clear guidelines on what the current month's instruction must include. Throughout the classrooms, teachers post

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[139] Ibid.
[140] Chenoweth. K. "It's Being Done: East Millsboro Elementary School."  The Education Trust., 2006, p  1.
    www.edtrust.org/sites/edtrust.org/files/publications/files/EMillsboro.pdf
[141] Ibid., p. 2.
[142] Ibid.
[143] Ibid.

essential questions drawn from the curriculum map, such as: "How do I tell the difference between cumulous, cirrus, and stratus clouds?" and "How do I use a factor tree to find prime numbers?"[144] These questions help build awareness of learning goals among the students.

Each year when East Millsboro receives its scores on state tests, the teachers convene to discuss the content that gave students trouble and to modify the curriculum to reflect these points. "Teachers identify the areas of need, go to the month in which the missed content was taught, and add time, new materials, or tweak the map in some other way so that the following year their students have a greater opportunity for success."[145] These review sessions help teachers reorganize lessons so that they can cover all material applicable to the state exams prior to the March testing date. During these sessions, teachers also work to identify and eliminate redundancies in material across subjects. For example, if both math and science classes include a unit on weights and measures, the curriculum map might be reworked so that the science unit incorporates all the necessary math lessons and additional time is freed up for math instruction.

An essential element of the curriculum map strategy is to have a designated time each week for the school's teachers to hold discussions focused on the curriculum map and student progress. One day a week at East Millsboro, paraprofessionals and other adults supervise classrooms for the final 45 minutes of the school day. As the contractual day extends 30 minutes beyond the school day, this gives teachers one hour and 15 minutes to discuss the curriculum map in their grade-level teams. These professional learning communities include all teachers in a grade level, as well as the reading, writing, and math specialists, the ESOL teachers, and the special education teacher.[146] The weekly meetings include discussions on a variety of topics, with examples including an ongoing comparison between class grades and standardized test scores or the development of interim assessments. These assessments, administered to students every few weeks, help to determine if any students have lagged behind in their work so that teachers can intervene before the minor problems develop into major concerns.[147]

## COMMUNITY-BUILDING PROGRAMS

While many interventions aimed at closing the achievement gap pertain to in-school activities, services, and pedagogical approaches, much of the literature and research addressing this issue also emphasizes the need to reach out beyond the school setting to build strong community relationships, increase the involvement of parents, and raise cultural awareness among teachers. In this section of the report, we review several studies and examples of such programs that have had an impact on the achievement gap.

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[144] Ibid., pp 2-3.
[145] Ibid. p. 3.
[146] Ibid.
[147] Ibid.

According to the Center on School, Family, and Community Partnerships at Johns Hopkins University, large-scale improvements to education can be made if "schools, families, and communities work together to promote successful students."[148] **Research shows that quality partnerships between schools and their communities can result in "improved attendance, motivation, conduct, and academic achievement" among students**, while communities also reap many benefits. Through mutual ownership of the achievement problem, community leaders can join together to create partnerships with flexible leadership structures and components that address key local concerns.[149] The California State Department of Education states that "[t]he key to an effective community partnership is that members of a community bring to the table different resources, skills, and knowledge needed to take action." When this is achieved, partners can reach outcomes than can't achieve individually.

### LITTLE ROCK SCHOOL DISTRICT (ARKANSAS)

The largest district in the state of Arkansas, the Little Rock School District serves roughly 27,000 students across 48 schools.[150] According to an NEA report, approximately 70 percent of students are African American and around two-thirds are economically disadvantaged. The District is a strong example of how community involvement can transform a school and the achievement levels of its students. In 2007, following the end of federal supervision of the district and the departure of a superintendent who had failed to address low achievement of the district's poor African American students, Little Rock hosted a community conversation  in which about 250 attendants addressed three priority areas: "encouraging family and community involvement, strengthening intervention programs for students who fall behind, and clearly defining what is expected of all students."[151] As described by the NEA, this event resulted in an unprecedented level of response from its community, which included many people who had not previously been concerned with achievement gaps.

Between 2006 to 2008, the district saw a 7 percent increase in its high school graduation rate, from 76 percent to 83 percent.[152] Progress is even more visible among grade 5 African American students, as 45 percent scored at proficient in 2009, compared to the 2006 level of 25 percent, effectively narrowing the achievement gap by 20 percentage points. These improvements in student performance have been credited to the "greater involvement of— and increased outreach to—previously marginalized groups, especially the African American community."[153] Through the district's ongoing community conversations, members of the African American community not only attended gatherings, but were "the leaders of the

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[148] "Center on School, Family, and Community Partnerships." Johns Hopkins University.
www.csos.jhu.edu/p2000/center.htm
[149] "How to Form Partnerships." California Department of Education.
http://www.myboe.org/portal/default/Content/Viewer/Content?action=2&scId=100026&sciId=934
[150] Moldauer, B. September "Stories of Closing Achievement Gaps through Community Engagement."  National Education Association, 2009, p. 11. http://www.nea.org/assets/docs/HE/PEPSuccessStories.pdf
[151] Ibid., p. 12.
[152] Ibid.
[153] Ibid.

conversations." The community conversations were supported by the NEA's Public Engagement Project, the Little Rock Classroom Teachers Association, and coalition partners.

## PARENTAL INVOLVEMENT PROGRAMS

There is a widespread consensus in the education community regarding the importance of parental involvement in the academic achievement of their children. Some research even suggests that as much of half of the gap in school readiness is due to differences in parenting.[154] A 2005 study published in the *Journal of Negro Education* found that parental involvement "had a positive impact on the educational outcomes" of grade 12 African American students, but that parents were "slightly more likely to be involved in the education of their daughters than they were in the education of their sons."[155]

The *Journal* also highlighted other findings related to parental involvement, including that parental involvement is "salient in determining how well children do in school at both the elementary and secondary school levels," and that it is especially impactful on students' mathematics achievement.[156] Meanwhile, a 1999 study points to parental involvement as having "direct effects on first-grade [male students'] reading and math achievement and socio-emotional maturity."[157] This research also suggests that parental involvement—and teachers' perception of parental involvement—may be particularly important for the success of African American boys.[158] In addition, a recent study of longitudinal data observed more than 1,500 low-income students to discover that parent involvement serves as a "mechanism through which the long-term effects of interventions are achieved, ultimately leading to higher levels of student performance."[159]

### PARENT INSTITUTE FOR QUALITY EDUCATION (PIQE)

The Parent Institute for Quality Education (PIQE), established in 1987, offers a series of programs aimed at increasing parental involvement in their children's education. Its signature offering is the Parent Engagement Education Program, a free nine-week training course in which parents learn to create a "lasting educational environment at home" through methods such as "dedicating a home study location and time of day for homework" and "creating ongoing dialog with their kids' surrounding their academic successes and

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[154] Waldfogel, J. "The Role of Out-of-School Factors in the Literacy Problem." The Future of Children, 22:2, 2012, p. 42. http://futureofchildren.org/futureofchildren/publications/docs/22_02_03.pdf

[155] Jeynes, W. "Effects of Parental Involvement on the Academic Achievement of African American Youth. *Journal of Negro Education.* 74:3, 2005. http://www.jstor.org/discover/10.2307/40027432?uid=3739776&uid=2&uid=4&uid=3739256&sid=21104398073 153

[156] Ibid.

[157] Mandara, J. "The Impact of Family Functioning on African American Males' Academic Achievement: A Review and Clarification of the Empirical Literature." *Teachers College Record,* 108:2, February 2006, p. 10. http://ebfrwg.files.wordpress.com/2011/02/family-functioning1.pdf

[158] Ibid.

[159] Barton, P. and Coley, R. "Parsing the Achievement Gap II." Education Testing Service, April 2009, p. 16. www.ets.org/Media/Research/pdf/PICPARSINGII.pdf

challenges."[160] Through these courses, PIQE also emphasizes the creation of a "bridge between home and school," and parents are equipped with extensive information regarding planning for their children's college education.[161] PIQE provides these courses in 16 different languages, and the series "culminates in a parent group meeting with the school principal, followed by a PIQE graduation ceremony." Nearly a half-million parents have graduated from PIQE programs since its inception.[162]

According to the Harvard Family Research Project, this program has proven to "successfully reduced high school dropout rates and college participation for Latino youth living in California."[163] In one California region, the children of PIQE parents experienced a 93 percent high school graduation rate– a vast improvement on the 53 percent graduation rate of Latinos nationally— and almost 80 percent of the Latino students with PIQE parents went on the college. The Project also highlighted several findings that arose from the study of this program that related to the importance of family involvement:

- Adolescents whose parents monitor their academic and social activities have lower rates of delinquency and higher rates of social competence and academic growth.

- Youth whose parents are familiar with college preparation requirements and are engaged in the application process are most likely to graduate high school and attend college.

- Youth whose parents have high academic expectations and who offer consistent encouragement for college have positive student outcomes.[164]

## CULTURAL AWARENESS PROGRAMS

Cultural awareness on the part of teachers is a factor that many scholars point to as a potential contributor to gaps in achievement between minority students and their White peers. As described in an NEA brief, the "cultural gap between students and their teachers can be a factor in students' academic performance and contribute to achievement gaps among different student groups."[165] According to the NEA, there are four essential areas of cultural competence needed for teachers to serve a diverse group of students:

- **Valuing diversity:** Accepting and respecting different cultural backgrounds and customs, different ways of communicating, and different traditions and values.

- **Being culturally self-aware:** Understanding that educators' own cultures—all of their experiences, background, knowledge, skills, beliefs, values, and interests— shape their sense of who they are, where they fit into their family, school, community, and society, and how they interact with students.

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[160] "Parent Engagement Education Program."  Parent Institute for Quality Education. www.piqe.org/prog_parentengage.php
[161] Ibid.
[162] Ibid.
[163] "Research Brief: Family Involvement Makes a Difference in School Success."  Harvard Family Research Project, 2006, p. 2. www.hfrp.org/content/download/1263/48766/file/family_involvement_success.pdf
[164] Bulleted points taken verbatim from: Ibid.
[165] "Promoting Educators' Cultural Competence to Better Serve Culturally Diverse Students." National Education Association, 2008, p. 1. http://www.nea.org/assets/docs/PB13_CulturalCompetence08.pdf

- **Understanding the dynamics of cultural interactions:** Knowing that there are many factors that can affect interactions across cultures, including historical cultural experiences and relationships between cultures in a local community.

- **Institutionalizing cultural knowledge and adapting to diversity:** Designing educational services based on an understanding of students' cultures and institutionalizing that knowledge so that educators, and the learning environments they work in, can adapt to and better serve diverse populations.[166]

In addition, there are many benefits of promoting cultural awareness among teachers. While growing minority enrollment in public schools nationwide makes cultural awareness an imperative, there are more complex implications relating to the way teachers and students interact and to the overall effectiveness of teaching. Because each student is culturally unique, educator must be "knowledgeable about their students' distinctive cultural backgrounds so they can translate that knowledge into effective instruction and enriched curriculum."[167] To this end, cultural awareness programs can allow teachers to be more effective by providing them with the knowledge needed to properly "contextualize or connect to students' everyday experiences, and integrate classroom learning with out-of-school experiences and knowledge." Therefore, school districts must take actions to properly train their teachers in cultural competence. As recommended by Landsman et al. in *White Teachers, Diverse Classrooms*, districts should "appropriate for district-wide training" in order to assist their teachers in making "vital connections with students of color to improve academic achievement."[168]

Unfortunately, despite the degree of agreement regarding the importance of cultural competence, our review of research did not uncover specific examples of schools or districts in which cultural competency training programs directly led to narrowing gaps in achievement between student groups. In fact, the majority of available resources for developing culture competency in teachers focuses on the curriculum of postsecondary teacher education programs, or offers conferences or packages that can be purchased from vendors.

However, research does point to cultural competent teaching practices—which is often the direct result of cultural competency training—as having a strong impact on achievement among underrepresented groups. In 1995, for example, Ladson-Billings examined the practices of successful teachers of African American students in culturally diverse schools through a three-year observational study, finding that teachers who possessed the ability to relate to their students' cultures and communities were most effective in reaching their students.[169] Below, we provide a review of practices used in one school to develop cultural understanding among students.

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[166] Bulleted points taken verbatim from: Ibid.

[167] Ibid., p. 2.

[168] Landsman, J. and Lewis, C. "White Teachers: Diverse Classrooms." Sterling, VA: Sylus Publishing, LLC, 2006, p. 320. books.google.com/books?id=NaVkh_XxFT0C

[169] Ladson-Billings, G. "But That's Just Good Teaching! The Case for Culturally Relevant Pedagogy." In: Klump, J. "Research-Based Resources: Cultural Competency of Schools and Teachers in Relation to Student Success."

## HERNDON HIGH SCHOOL (VIRGINIA)

In the publication *Principal Leadership,* the National Association of School Psychologists recognized Herndon High School as an example of a school that "honors, respects, and values diversity in theory and in practice and where teaching and learning are made relevant and meaningful to students of various cultures."[170] Herndon High School serves a very large student population (2,266 students) that is culturally and economically diverse.[171] Daniel Domenech, the former superintendent of Fairfax County Public Schools, stated that, based on the successes at Herndon High School, he would recommend that other schools also "look at diversity as an opportunity to learn, and not as a problem in your school."[172]

More specifically, in order to help create a culturally responsive school setting, Herndon High School provides an inclusive range of programmatic offerings, which include the following:

- Elective courses designed to help students from diverse backgrounds get along, such as Combating Intolerance
- Peer mediation to allow students from diverse backgrounds an opportunity to talk about potentially divisive issues
- Student clubs that help large groups of students retain cultural identity (e.g., Muslim Student Society)
- Openness to starting new clubs to reflect the interests of the student body
- Parent liaisons who are paid to work with families who would not otherwise have a traditional involvement with the school
- Home visits by parent liaisons
- Telephone tree in multiple languages
- Minority parent committee that organizes evenings for minority parents to come to school in smaller groups and learn about the college admissions process, SAT prep classes, scholarship and grant opportunities, and so forth
- Letters sent home and phone contact with parents from culturally and linguistically diverse backgrounds to ensure a good turnout at parent meetings
- Open communication with students

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Northwest Regional Education Laboratory, 1999, p. 12.
www.ode.state.or.us/opportunities/grants/saelp/cuturlcmptencebibnwrel.pdf

[170] Klotz, M. B. "Culturally Competent Schools: Guidelines for Secondary School Principals." *Principal Leadership,* March, 2006.
http://www.nasponline.org/resources/principals/Culturally%20Competent%20Schools%20NASSP.pdf

[171] [1] "Total Enrollment for Herndon High 2011-12." U.S. Department of Education, National Center for Education Statistics. http://nces.ed.gov/ccd/elsi/quickFacts.aspx
[2] "Fairfax County Public Schools 2010-2011 School Improvement Plan: Herndon High School." Fairfax County Public Schools. http://www.fcps.edu/HerndonHS/about/pdf/SIP2010-11.pdf

[172] Ibid., p. 14.

- Quarterly meetings between a randomly selected group of students from each grade level and their administrator to obtain feedback on how school is going for them and what specific things can be improved or changed

- Effort Awards honor breakfast for students who have had trouble but who have raised their grades; each teacher nominates two students from his or her class

- Establishment of a Hispanic PTSA with business discussion and programs in Spanish

- Initiation of a "challenge" program to invite promising students to enroll in honors and Advanced Placement classes.[173]

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[173] Bulleted items taken verbatim from: Ibid., p. 12.

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