



# **High Performance Learning Communities District 2 Achievement**

## **High Performance Learning Communities Project Community School District #2, New York City**

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# High Performance Learning Communities

## District 2 Achievement

This is a report on achievement results in District 2 elementary and middle schools for the first year of the High Performance Learning Communities Project. The report focuses especially on results from the New Standards Reference Examinations in Mathematics and English Language Arts. These examinations are systematically referenced to the standards that District 2 is implementing as a key part of its high performance learning strategy and can be expected to reflect the status of instruction and professional development efforts in the district.

## Overview of District 2 Achievement Results

The New Standards Reference Examinations are performance and multiple choice on-demand assessments that are systematically referenced to the New Standards *Performance Standards* for mathematics and English Language Arts (New Standards, 1997). Scores are reported in *standards clusters*. Each student receives a separate grade on each cluster.

Possible grades are:

Achieved the Standard with Honors

Achieved the Standard

Nearly Achieved the Standard

Below the Standard

Little Evidence of Achievement

Students receive grades in four English Language Arts standards clusters:

Reading: Basic Understanding  
Reading: Analysis and Interpretation  
Writing  
Conventions

They also each receive grades in three Mathematics standards clusters:

Mathematical Skills  
Conceptual Understanding  
Problem Solving

The New Standards examinations were administered in all schools in District 2 in June, 1997. Figure 1 provides an overview of the number of students in elementary, middle, and high school who took the examinations, along with information on the number of students for whom full exam scores were reported.

Figures 2 and 3 show the percentage of fourth grade students throughout District 2 who met or exceeded the standard (i.e., received grades of *meets the standard* or *meets the standard with honors*) in each standards cluster. The percentage meeting or exceeding the standard in English Language Arts ( 55% for Basic Understanding; 42% for Analysis and Interpretation; 44% for Writing; and 42% for Conventions) was very high in comparison to other districts with similar demographic characteristics who have also administered the New Standards exams. District 2 performance on the Mathematics standards clusters was not particularly distinguished, however. The percentage meeting the Standard or higher (43% for Skills, 28% for Concepts and 19% for Problem Solving) were about the same as those in a comparative district. The difference between Mathematics and English Language Arts achievement reflects the focus of District 2 professional development and accountability efforts over the eight years prior to initiation of the High Performance Learning Communities project.

The District had until recently focused most of its very substantial professional development efforts on literacy, with only marginal attention going to mathematics.

Figures 4 and 5 show the percentage of eighth grade students in the district who met or exceeded the standard in each cluster. These percentages, ranging from 64% to 71% are even higher than those for fourth grade. Although the overall math performances were not quite so high (they ranged from 27% to 59%), they are stronger than the fourth grade. Overall, the math and reading scores represent exceptional performance for an urban school district.

Although the exam was administered to the high school students enrolled in District 2 schools, the very small number of students enrolled and the specialized nature of the schools make these data of less immediate interest to our study of a district-wide strategy for raising school achievement.

## **School Performance Disaggregated by Socioeconomic Status**

District 2--like many other urban districts--includes a diversity of schools as well as a diversity of students. Some schools have populations made up almost entirely of children from poor families; others have only a few such children. Schools with a primarily poor population, of course, have a particularly great challenge to meet in attempting to reach high levels of achievement. In order to evaluate how well District 2 schools are meeting this challenge, we ranked the schools by proportion of students eligible for free or reduced lunch and used these rankings to establish four quartile groupings of schools. Achievement data were then analyzed separately for each of the quartiles. Dividing the schools into quartiles yields the distributions shown in Tables 1 (elementary) and 2 (middle).

The most striking feature of both of these distributions is the existence of schools in the bottom and top quartiles that are very homogeneous in terms of poverty levels of the students

(narrow range of percent eligible and small standard deviations), while the two middle quartiles are quite varied (wider range and substantially larger standard deviations).

## **English Language Arts achievement in the elementary schools**

Figures 6-9 show the mean percentage of elementary school students at or above the standard (solid lines) and the mean percentage of students well below the standard (dotted lines) for the four English Language Arts standards clusters for the four SES quartiles<sup>1</sup>. As is typical elsewhere, more students met or exceeded the standard in basic reading (Figure 4) than in the other standards clusters. Even the low SES schools--those with more than 90% of students eligible for free or reduced lunch--did reasonably well, with more than 40% of their students meeting a very demanding reading standard. While there was the expected overall association of achievement levels with SES, there was for the Basic Understanding standards cluster (Figure 6) an essentially bimodal distribution. Schools in the first and second quartiles of SES did not differ much from one another, and the same was true of schools in the third and fourth quartiles. But the two high SES quartiles performed much better than the two low ones. For the Analysis and Interpretation, Writing and Conventions standards clusters (Figures 7, 8, and 9), there was a much smoother progression from one quartile to the next, with the proportion of students meeting the standard rising with each quartile.

## **Mathematics achievement in the elementary schools**

Figures 10-12 show the same data plots for the three Math standards clusters. There is a similar association of achievement with SES. Overall, as is characteristic elsewhere on the New Standards examinations, achievement was higher for mathematical skills than for concepts

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<sup>1</sup> For each standards cluster, some children fell into the intermediate score category “Nearly Meets the Standard.” In order to clearly highlight successes and failures of the schools in getting their students to standards, these intermediate cases were omitted from the graphs.

and problem solving. On skills--and to a lesser degree on concepts--high SES students did quite well (nearly 70% meeting the standard on skills, over 50% meeting the standard on concepts) with a sharp drop for the other quartiles, and especially low performance for the bottom two quartiles. On problem solving, even the high SES schools did not do very well. Only about 35% of their students--the same ones who met standards at rates of 60% to 70% in literacy--were able to meet or exceed the problem solving standard.

### **English Language Arts achievement in the middle schools**

Figures 13-16 show the mean percentage of middle school students above and below the standard in English Language Arts in the four SES quartiles. Several features are striking in comparison with the elementary school performances. First is the overall higher level of performance, which we have already noted. Second, there is a less marked association with socioeconomic status, with schools in all quartiles performing quite well. Finally, there is less of a disparity between Basic Understanding scores and those on the other standards. Eighth grade students performed nearly as well on Analysis and Interpretation, Writing and Conventions as they did on Basic Reading.

### **Mathematics achievement in the middle schools**

Figures 17-19 show the achievement data for middle schools in mathematics. Compared to the elementary schools, the middle schools performed better on the skills standard. Performances were similar to those of elementary schools on the concepts and problem solving standards. The association of scores with SES parallels what we have seen for English.

## School Performance Disaggregated by Language Status

District 2 has a significant proportion of children who are classified as having limited English proficiency (LEP). Schools with high proportions of such children, like schools with many poor children, face a particularly great challenge in educating all of their students to high standards. In order to evaluate how well District 2 schools are meeting this challenge, we ranked the schools by proportion of students classified as LEP and used these rankings to establish four quartile groupings of schools. Achievement data were then analyzed separately for each of the quartiles. Dividing the schools into quartiles according to proportion of LEP students yields the distributions shown in Tables 3 and 4.

The patterns of LEP student presence are quite different in elementary and middle schools. Basically, there is a much lower proportion of LEP students in the middle schools than in the elementary schools. Only in the highest quartile of the middle schools are there more than 27% of LEP students, while that proportion of LEP students are present in the Medium Low quartile of elementary schools. At both school levels, there is relatively little variability in proportion of LEP students within each quartile, except for the High LEP quartile, where some schools have many more LEP students than others. These differences will be important to bear in mind as we examine achievement data of schools in relation to their language status.

In both elementary and middle schools, LEP and SES status of the schools are very highly correlated. For elementary schools, the percentage of LEP students and percentage eligible for free lunch shows a correlation of  $-.73$ .<sup>2</sup> At middle school, the correlation is  $.81$ . Basically, high LEP schools are low in socioeconomic status, although there are a few low SES elementary schools that do not have high proportions of LEP students.

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<sup>2</sup> There is one school in the highest quartile with respect to proportion of LEP students that is in the Medium High SES quartile. If this school is dropped, the correlation rises to  $-.83$ . This school's performance on exams is just where LEP status would predict, but at the low end of what SES status would predict. Thus, the school's performance is, apparently, affected by the higher than usual proportion of non-English speakers.

## **English Language Arts achievement in the elementary schools**

Figures 20-23 show the mean percentage of students at or above the standard and the mean percentage of students well below the standard for the four English Language Arts standards clusters for the four LEP quartiles. The patterns generally parallel those for the SES breakout. Performance was better on the basic reading cluster (over 40% at or above standard) for the high LEP and medium high LEP quartiles than on the analysis and interpretation, writing and conventions cluster (around 30-35% at or above standard). On all standards clusters, a substantially lower proportion of tested students in the two quartiles with high percentages of LEP students met the standard. On the two reading standards, the medium high LEP cluster performed relatively weakly; but on writing and conventions there was a smoother progression from one LEP quartile to the next.

## **Mathematics achievement in the elementary schools**

Figures 24-26 show the same data plots for the three Math standards clusters. Again, the parallel with the SES breakouts is striking. Overall, achievement was higher for mathematical skills than for concepts and problem solving. The performance of the high and medium high LEP quartiles on skills is similar, and noticeably lower than the medium low and low LEP quartiles. A similar pattern emerged for concepts. Even the low LEP quartile did not do well on problem solving, however. Only about 30% of the students who met standards at rates of 55% to 70% in literacy were able to meet or exceed the problem solving standard.

## **English Language Arts achievement in the middle schools**

Figures 27-30 show the percentage of eighth grade students meeting and not meeting the standards in English Language Arts. There was a generally steady increase in performance from the high to low LEP quartiles for all language clusters, with the sharpest change occurring for the writing content cluster. The high LEP quartile typically met standards at rates of 50-60% and the low LEP quartile at rates of 70-80%.

### **Mathematics achievement in the middle schools**

Figures 31-33 show the Mathematics achievement for the middle schools according to language status. Once again, the best performance occurred for skills, with rates of more than 40% for the high LEP quartile and 70% for the low LEP quartile. The concepts and problem solving standards showed distinctly lower rates of meeting the standards, with the high, medium high and medium low LEP quartiles showing similar percentages of students meeting standards, and the low LEP quartile performing noticeably better on these standards.

## **The Engagement Indices and School Achievement**

### **Nature of the engagement indices**

In District 2, the Deputy Superintendent (Elaine Fink), working jointly with the Director of Professional Development for the district (Bea Johnstone), make frequent visits to each of the schools and are intimately familiar with the quality of teaching, the level of student work in classrooms, and the overall degree of engagement in the school-based professional development activities that are a hallmark of the district's high performance program (see reports on district level and school level learning communities for more detail on these programs). Because of their deep knowledge of each of the schools in the district, we judged

that their ratings of the schools, based on multiple visits and discussions with the school staff, would provide the most reliable indices of variations in school quality and engagement in the District 2 program.

The process of building the Indices began with extended interviews of Fink and Johnstone, conducted by Lauren Resnick. On the basis of these interviews a set of 13 dimensions on which schools could be rated were established. These dimensions were:

*1-Quality of Student Work:* Judgments based on observations at the school, not on test scores.

*2-Quality of Teaching:* Judgments of the overall quality of classroom instruction observed in the school.

*3-Quality of Staff:* Judgments of the overall quality of teaching staff in the school.

*4-Professional Development:* Judgments of the extent and quality of professional developers' activities in the school.

*5-Parents and Community:* Judgments of the degree to which the school is connected to parents and the community.

*6-Leadership--Culture:* Extent to which the principal has established a culture of continuous professional development and improvement among the staff.

*7-Leadership--Content:* Extent to which the principal focuses professional development on instructional practice and content.

*8-Leadership--Discriminate:* Extent to which the principal can discriminate quality of teaching.

*9.- Leadership--Select:* Extent to which the principal has selected new teachers well.

*10-Leadership--Weed:* Extent to which the principal has been successful in weeding out very weak teachers.

*11-Improvement:* Degree of improvement in the school since the current principal came on board.

*12-Global:* Judgments of the overall quality of the school.

*13-Potential:* Judgments of the extent to which the school is now poised for improvement.

Once the dimensions were established, Fink and Johnstone independently rated each school in the district on each dimension, using a scale of 1 to 10 in which a 10 rating was the highest positive judgment. Where Fink and Johnstone disagreed, they discussed the rating and agreed on a common judgment. Their agreed common judgment is used in the discussion that follows. We report on elementary schools only, as there were not enough middle schools to justify the statistical analyses that follow.

### **Clustering the ratings**

The patterns of ratings of Fink and Johnstone provide a window on District 2's theory of what makes a good school, and in particular what is likely to raise learning levels of students. Table 5 shows the intercorrelations among their ratings across all elementary schools. As can

be seen, these correlations vary substantially from a low of .41 to a high of .99. In order to detect the underlying patterns, we carried out a hierarchical cluster analysis of the ratings. Figure 34 shows the results. This kind of analysis begins by treating the full set of variables as a group (top of the figure, step 1), then searches for successive “splits”. At each step it finds the variable, or cluster of variables, with the weakest association with the group and creates a split. Thus, the Figure shows that at step 2 the *Parents and Community* variable separated out from the others, and at step 3 the *Leadership-Weed*. These two variables were, in other words, only weakly related to the other dimensions and to one another.

Dropping to the final step (11) in the analysis, we can see that two of the variables, the *Global* judgment of the overall quality of the school and *Quality of the staff* never separate (see circled boxes in bottom row). These two variables are correlated at .99, so they are essentially identical judgments. We see here a key feature of District 2’s theory of what makes a good school--*a good school is one that has a high quality teaching staff*. This theory of the good school matches their decision that they can *create* good schools by investing in human resource development.

Moving upwards in Figure 34, we find that another pair of variables were so highly correlated that they separated at only the next to last step (10) in the analysis (see circled boxes, step 10). These are *quality of teaching* and *quality of student work*. These two dimensions correlate with each other at .84, and with the global rating at .93. They represent District 2 leadership’s core definition of how a high quality staff will display its quality: *It will do good teaching and that will result in very good student work*. Several steps up the analysis (step 7, 6, and 5), we see that this quality of teaching and student work sub-cluster is combined with the quality of staff/global sub-cluster (see circled boxes and labels). Thus, the 3 variables of student work, quality of teaching and quality of staff seem to be at the core of District 2’s definition of good educational practice.

At step 5 of the Figure, a subcluster of variables separates from the quality cluster just discussed. This sub-cluster includes variables that center on the character of professional leadership and professional development in the school (*Professional Development, Leadership-Culture* and *Leadership-Content*) that are tightly linked to Fink and Johnstone's estimate of the school's potential for growth.

Finally, we can note that the District 2 theory includes a separate focus (emerging at step 4) on the capacity of the school leader to discriminate good teaching and to select good staff.

### **The ratings related to school achievement, SES and LEP**

Our next step was to examine relations between the engagement indices and exam performance. We first tried to reduce the number of separate engagement indices by forming aggregate indices based on the clustering patterns of the separate ratings.

The cluster analyses suggested the presence of one strong cluster of engagement indices: Global School Quality, Quality of Staff, Quality of Student Work, and Quality of Teaching. A principle component analysis of the correlations among these four indices indicated that one component (or factor) underlies these four indices and that each engagement index contributes approximately equally to a Teaching Quality factor; this result is also supported by the high bivariate correlations among the four indices shown in Table 5. We therefore computed a new Teaching Quality index, consisting of the average of the ratings on the four separate indices. The aggregate Teaching Quality index, rather than the four separate indices, was used in studying the relationship of the judgments to exam performance. Principle components analyses of the remaining engagement ratings did not warrant creating aggregate indices, so these ratings were treated independently.

The results of a principle components analysis of the four English Arts standards clusters for students scoring at or above the standard suggested that they could be represented by a single variable, as could students scoring below the standard on the English Arts standards clusters. This produced two new variables, one reflecting the (average) percent of students scoring at or above the standard in a school on the four English Arts standards clusters (EnglishAbove), and another reflecting the (average) percent of students scoring below the standard in a school on the English Arts standards clusters (EnglishBelow). A similar pattern of principle components results was confirmed for the Mathematics standards clusters, again resulting in two new variables: one reflecting the (average) percent of students scoring at or above the standard in a school on the three Mathematics standards clusters (MathAbove), and one reflecting the (average) percent of students scoring below the standard in a school on the Mathematics standards clusters (MathBelow).

Table 6 shows the correlations of the ratings with the four achievement variables. The aggregate Quality rating showed the highest correlation with EnglishAbove (.61), EnglishBelow (-.59), MathAbove (.54) and MathBelow (-.54). It is important to note that the engagement index judgments were made without knowledge of New Standards results. The judgments of quality of student work are based on classroom work seen during regular visits by Fink and Johnstone to classrooms in each of the schools. Equally high correlations appeared for the two variables that describe the capacity of the school leader to discriminate good teaching and to select good staff. Thus, we see an apparent confirmation that the core District 2 focus on quality of staff in schools is indeed central to achievement of students. However, more refined analyses (reported below) suggest that the leadership indices do not account for much of the variance among schools over and above SES and language status.

At the level of simple correlation, there is less confirmation in these data that the quality of professional development in schools is directly related to achievement. Correlations of the professional development variable and the two leadership dimensions directly related to professional development are related only modestly to examination scores. However, as we

shall see shortly, there is a complex relationship of the Professional Development and the Teaching Quality index that supports District 2's theory-in-action concerning professional development.

In light of the high association between a school's average achievement level and the proportion of low SES (i.e., high percentage of students eligible for free lunches) and LEP children in the school, it is reasonable to expect that teaching quality and other indices would also be associated with SES and LEP. Table 7 shows the correlations between the indices and SES and LEP. The correlations are in the direction expected, with generally lower correlations with LEP than with SES.

**Regression Analyses.** Next, univariate multiple linear regression models were separately fitted to the EnglishAbove, EnglishBelow, MathAbove, and MathBelow variables. The predictor variables in all cases were SES, LEP, and several of the engagement indices (Professional Development, Parents and Community, Leadership-Discriminate, Leadership-Select, Potential, Teaching Quality). Although the total number of 4th grade classrooms constituting the sample was 26, there was missing data. The reduced number of indices is the result of missing data for some schools. Two regression solutions for dealing with missing data were used: pairwise deletion of schools which typically resulted in a sample size of approximately 20, and mean imputation of missing data, in which missing values are estimated by imputing the mean that variable computed using available data. This produced a sample size of 26. Both regression solutions produced similar results; but as expected, mean imputation resulted in more conservative findings, such as smaller proportion of variance accounted for statistics. We report the slightly more conservative regression results obtained with mean imputation.

Initial analyses led to the elimination of several of the engagement predictors because they did not contribute to explaining variation in the dependent variables. In fact, only two predictors related to the engagement indices accounted for a significant amount of variation in

the dependent variables above and beyond that attributable to SES and LEP: Teaching Quality and Professional Development. The main regression analyses, therefore, studied the effects of four predictors: SES and LEP, which were always entered into the model first, and Teaching Quality and Professional Development. These two indices accounted for a significant amount of variation in all four dependent variables with the effects of SES and LEP controlled.

Interestingly, entering Teaching Quality by itself in the prediction model did not account for a significant amount of variation above and beyond that attributable to SES and LEP; the same was true when Professional Development was entered into the model by itself. However, when Teaching Quality and Professional Development were entered together into the prediction model they always accounted for a significant amount of variation in the dependent variables beyond that attributable to SES and LEP. This result suggests that these two predictors, which are highly correlated collectively ( $r = .91$ ), represent a construct that neither index individually captures. The first-order interaction of Teaching Quality and Professional Development was tested for all models but did not contribute anything beyond predictors already in the model.

For the EnglishAbove variable, SES and LEP accounted for a significant amount of variance (58%), and Teaching Quality and Professional Development accounted for an additional (significant) 20% ( $R^2$  statistics which are adjusted to take the number of predictors into account are reported). Moreover, the estimated (standardized) regression coefficients associated with the Teaching Quality and Professional Development predictors were both statistically significant and fairly large (above .90). However, the slope for Professional Development was negative. A similar pattern emerged for the MathAbove variable, although the intervariable relationships were weaker. Once again SES and LEP accounted for a significant amount of variance (36%), teaching Quality and Professional Development accounted for an additional 20%, the estimated (standardized) regression coefficients associated with Teaching Quality and Professional Development were both statistically significant and fairly large (above .9), but the slope for Professional Development was negative.

For the EnglishBelow variable, SES and LEP accounted for a significant amount of variance (67%), and Teaching Quality and Professional Development accounted for an additional 13%. The estimated (standard) regression coefficients associated with Teaching Quality and Professional Development were both statistically significant and greater than .7, but the slope for Teaching Quality was negative. A similar pattern emerged for the MathBelow variable that once again included weaker intervariable relationships. SES and LEP accounted for a significant amount of variance (42%), Teaching Quality and Professional Development accounted for an additional 21% , the estimated (standardized) regression coefficients associated with Teaching Quality and Professional Development were both statistically significant and close to one, but the slope for Teaching Quality was negative.

The regression results show that once SES and LEP are taken into account, the Teaching Quality and Professional Development indices account for additional variation in the dependent variables ranging from 13% to 22%. The pattern of positive and negative slopes for the Teaching Quality and Professional Development predictors is at least partly due to Professional Development serving as a suppressor variable. As can be seen from the table of intervariable bivariate correlations, Professional Development shows weak or nonexistent correlations with the dependent variables, but a very strong correlation with Teaching Quality. Thus, Professional Development tends to suppress variance that it shares with Teaching Quality but not with the dependent variables. This suggests that whatever Teaching Quality and Professional Development share differ from what each dependent variable shares with Teaching Quality.

**Path analyses.** In order to clarify the complex relations between the Teaching Quality and the Professional Development indices, we ran a set of path analyses. These were designed to test a particular hypothesis: that Professional Development has a significant effect on Teaching Quality, which in turn affects achievement. To reduce the number of variables in the path analysis (important because of the very small number of schools involved), LEP was omitted from the analysis in light of its modest relationship with achievement. We further assumed that

SES might affect both Professional Development and Teaching Quality as well as achievement. The hypothesis tested can be represented as shown in Figure 32 for EnglishAbove. The same hypothesis was tested for the other dependent variables. Those results were generally similar to results for EnglishAbove, although the relationships among variables in the model for the mathematics dependent variables were weaker than those for language arts. We report only results for EnglishAbove.

The model tested is shown in Figure 35. Arrows in the figure show the expected direction of an effect. Preliminary analyses indicated that SES did not predict Professional Development, and this arrow was subsequently deleted. This deletion was important because it allowed the statistical fit of the path model to the data to be evaluated. The resulting fit of the model shown in Figure 36, which shows the results of the path analysis for EnglishAbove, was quite good.

The numbers on the arrows in Figure 36 show standardized path coefficients, which reflect the estimated effect of one variable on another expressed in standard deviations. As expected, there is a large direct effect of SES on EnglishAbove (-.43), meaning that, with other variables held constant, each one standard deviation increase in SES (i.e., in the % of students eligible for free or reduced lunches) is associated with a .43 standard deviation decrease in EnglishAbove performance. There were also significant path coefficients for the remaining direct effects. SES had a weak direct effect on Teaching Quality (-.22), and Teaching Quality had a strong effect on EnglishAbove (1.16). Professional Development had a direct effect on Teaching Quality (.89) and EnglishAbove (-.95), but, as would be expected from the regression results described earlier, the path coefficient carried a negative sign. An important focus of the path analyses was to estimate the effect of Professional Development (through Teaching Quality) on EnglishAbove. This standardized indirect effect was relatively large (1.03), suggesting that Professional Development has a strong effect on EnglishAbove through the intervening variable Teaching Quality. All this is in accord with the hypothesis being tested.

There is a puzzle, however, Professional Development had, as noted, a substantial negative effect on EnglishAbove. The only explanation we can presently offer is that in schools with relatively high achievement there tends to be less investment in systematic Professional Development. This is a plausible hypothesis especially because very high achieving and high SES schools tend to be less closely monitored in District 2 than are other schools (see Burney & Elmore report). However, we will need to undertake more detailed investigation of patterns of professional development before accepting this as a conclusion.

## **General Discussion**

The overall New Standards achievement results for District 2 reflect the quality and intensity of the District's commitment to human resource development and to standards-based instructional practice. In English Language Arts, which has been the focus of intensive investment in program development, professional development and professional accountability for a number of years, achievement results are outstanding. Even among schools with over 90% of children eligible for free or reduced lunch, the median school had nearly 40% meeting New Standards' very high standard in basic reading comprehension. The lowest performing elementary school had 20% of its students meeting this standard. On the yet more difficult analysis and interpretation and writing standards the median low SES school showed almost 30% percent of students meeting the standard. This very high performance on the New Standards English Language Arts exams is reflected in other achievement measures also available for District 2 Schools. As reported in Elmore & Burney's paper on variability in District 2, only about 11% of District 2 students scored in the lowest quartile of the CTB reading test in Spring 1997, compared with 24% and 25% for the city and the nation respectively.

The match of achievement results to where the effort in professional development and school accountability has been greatest and best targeted to the standards is

also reflected in the generally lower overall performance of elementary schools on New Standards' mathematics examinations. On the mathematical skills standards, the high SES schools performed about as well as they did on basic reading (about 70% meeting the standard). But the low SES schools had only about 35% meeting the standard (compared with nearly 50% in basic reading). On math concepts, aspects of the standards that are found more difficult everywhere among New Standards exam takers and that have only in the last year or so been the focus of District 2 professional development and accountability efforts, even the high SES schools had only 40 or 50% of their students meeting the standard and the low SES schools had well under 20%. We expect that, with the new professional development efforts in mathematics now underway in the District, these percentages will climb over the next few years.

In sum, the evidence suggests that the District 2's focus on instruction is a reality and is having powerful effects on student achievement--especially literacy. Furthermore, professional development, District 2's espoused route to improving teaching quality, appears to be having the desired effect on teaching and therefore on achievement, beyond the strong impact of SES.

**Table 1\***

**Socioeconomic Characteristics of Elementary Schools**

Low SES	> 90% eligible	SD = 4.00 (N= 7)
Med Low SES	53% to 90% eligible	SD = 10.80 (N = 5)
Med High SES	22% to 52% eligible	SD = 8.83 (N = 7)
High SES	< 22% eligible	SD = 4.1 (N = 7)

\*Note: SES = Socioeconomic status, SD = Standard deviation, N = Sample size per quartile. Two schools were removed from the sample of 28 due to peculiarities in the data provided by the publisher.

**Table 2\***

**Socioeconomic Characteristics of Middle Schools**

Low SES	> 82% eligible	SD = 4.13 (N = 3)
Med Low SES	49% to 81% eligible	SD = 9.55 (N = 3)
Med High SES	22% to 48% eligible	SD = 14.5 (N = 3)
High SES	< 21% eligible	SD = 4.13 (N = 3)

\*Note: SES = Socioeconomic status, SD = Standard deviation, N = Sample size per quartile.

**Table 3\***

**Language Characteristics of Elementary Schools**

Low LEP	< 26%	SD = .92 (N = 7)
Med Low LEP	26% to 51%	SD = 2.16 (N = 5)
Med High LEP	52% to 77%	SD = 3.98 (N = 7)
High LEP	> 77%	SD = 9.70 (N = 7)

\*Note: LEP = Limited English Proficiency, SD = Standard deviation, N = Sample size per quartile. Two schools were removed from the sample of 28 due to peculiarities in the data provided by the publisher.

**Table 4\***

**Language Characteristics of Middle Schools**

Low LEP	< 2.5 %	SD = .75 (N = 3)
Med Low LEP	2.5% to 9%	SD = 1.11 (N = 3)
Med High LEP	10.0% to 27%	SD = 5.13 (N = 3)
High LEP	> 27.0%	SD = 14.52 (N = 3)

\*Note: LEP = Limited English Proficiency, SD = Standard deviation, N = Sample size per quartile.

**Table 5\***

**Correlations Among Engagement Ratings for Elementary Schools**

	Quality Student Work	Quality Teaching	Quality Staff	Professional Development	Parents & Community	Leadership Culture	Leadership Content	Leadership Discriminate	Leadership Select	Leadership Weed	Global	Potential
Quality Student Work	1.00											
Quality Teaching	.95	1.00										
Quality Staff	.93	.93	1.00									
Professional Development	.83	.87	.92	1.00								
Parents & Community	.74	.69	.66	.52	1.00							
Leadership Culture	.79	.85	.85	.83	.70	1.00						
Leadership Content	.86	.86	.93	.93	.62	.88	1.00					
Leadership Discriminate	.71	.64	.83	.71	.49	.70	.84	1.00				
Leadership Select	.84	.80	.91	.82	--	.72	.87	.88	1.00			
Leadership Weed	.59	.57	.67	.66	--	.41	.79	.46	.55	1.00		
Global	.94	.94	.99	.90	.66	.85	.92	.76	.87	.61	1.00	
Potential	.89	.88	.94	.87	.67	.88	.95	.85	.87	.58	.95	1.00

\*Note: The sample sizes used in computing the correlations varied from 17 to 26 because of missing ratings for some indices on some schools. All correlations are significant at the .05 level unless indicated by --.

**Table 6<sup>†</sup>**

**Correlations Among Engagement Indices and Achievement for Elementary Schools**

	English Above	English Below	Math Above	Math Below
Teaching Quality	.61*	-.59*	.54*	-.54*
Global School Quality	.59*	-.55*	.54*	-.53*
Quality of Staff	.52*	-.50*	.46*	-.45*
Quality of Student Work	.64*	-.63*	.59*	-.56*
Quality of Teaching	.51*	-.42*	.43*	-.41
Leadership--Select	.61*	-.57*	.54*	-.53*
Leadership--Discriminate	.52*	-.55	.48*	-.48*
Professional Development	.26	-.25	.18	-.17
Leadership--Content	.42	-.44	.36	-.35
Leadership--Culture	.28	-.30	.24	-.26
Potential	.62*	-.63*	.56*	-.57*
Parents & Community	.52*	-.53*	.53*	-.55*
Leadership--Weed	.44*	-.43*	.43*	-.41

<sup>†</sup>Note: \* = Statistically significant at .05 level. The sample sizes used to compute the correlations varied between 17 to 26 because of missing engagement ratings for some schools.

**Table 7<sup>†</sup>**

**Correlations of Engagement Indices with SES and LEP for Elementary Schools**

	SES	LEP
Teaching quality	-.49*	-.34
Global school quality	-.46*	-.36
Quality of staff	-.51*	-.38
Quality of student work	-.55*	-.38
Quality of teaching	-.40	-.26
Leadership--Select	-.62*	-.41
Leadership--Discriminate	-.70*	-.44*
Professional development	-.33	-.28
Leadership--Content	-.51	-.37
Leadership--Culture	-.28	-.20
Potential	-.56*	-.51*
Parents & community	-.28	-.13
Leadership--Weed	-.41	-.34

<sup>†</sup>Note: SES = Socioeconomic status, assessed by the percentage of students within a school that are eligible for free or reduced lunch, LEP = Limited English proficiency. Sample sizes for the correlations ranged from 17-26 because of missing engagement ratings for some schools.

\* significant at the .05 level

Percent At Or Above Standard  
Fourth Grade English Language Arts

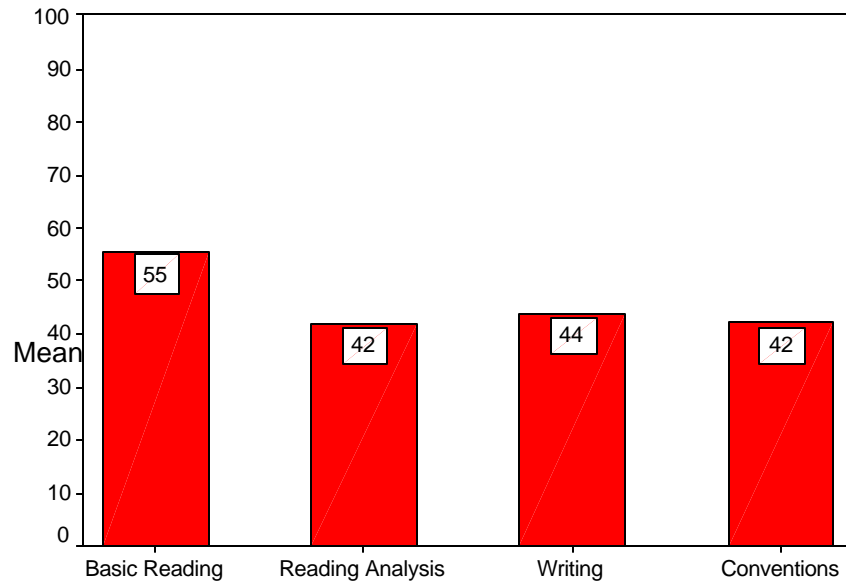
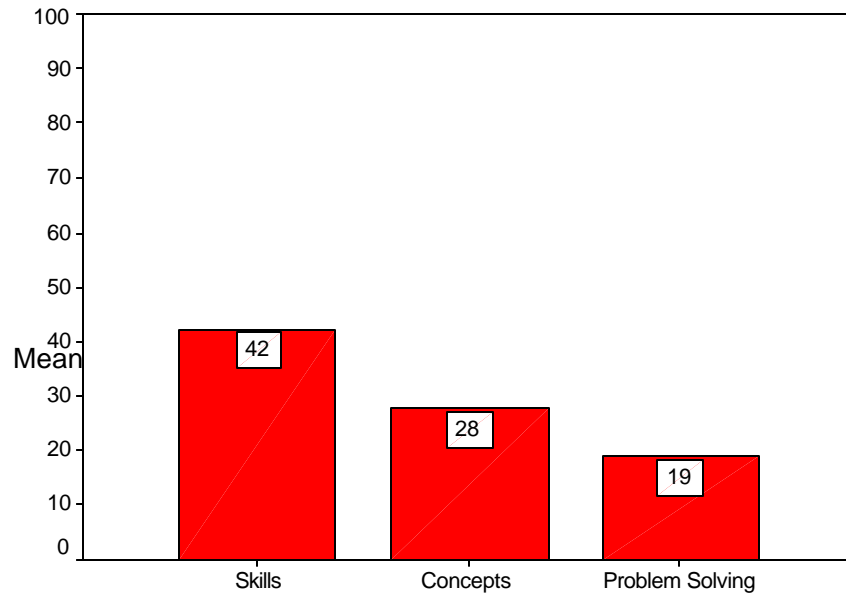


Figure 2

# Fourth Grade Mathematics



New Standards Reference Exam:Spring 1997

*Figure 3*

Percent At Or Above Standard  
Eighth Grade English Language Arts

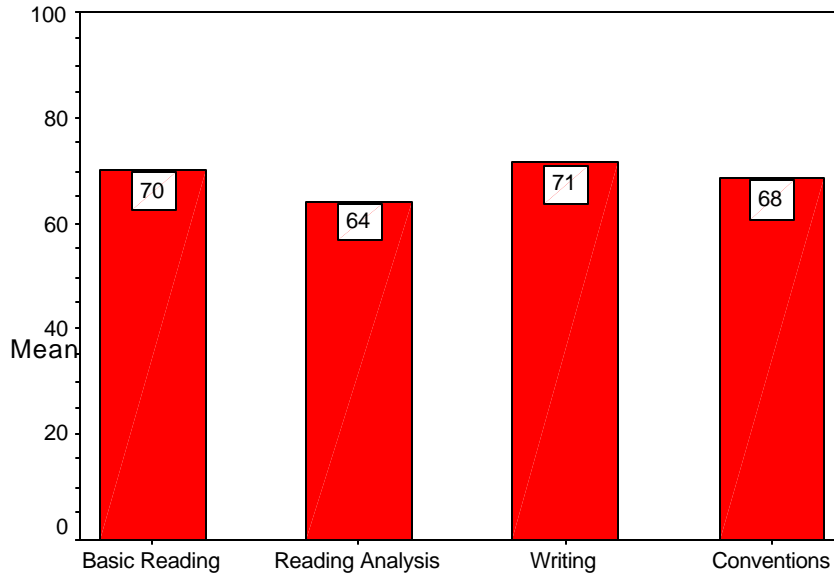
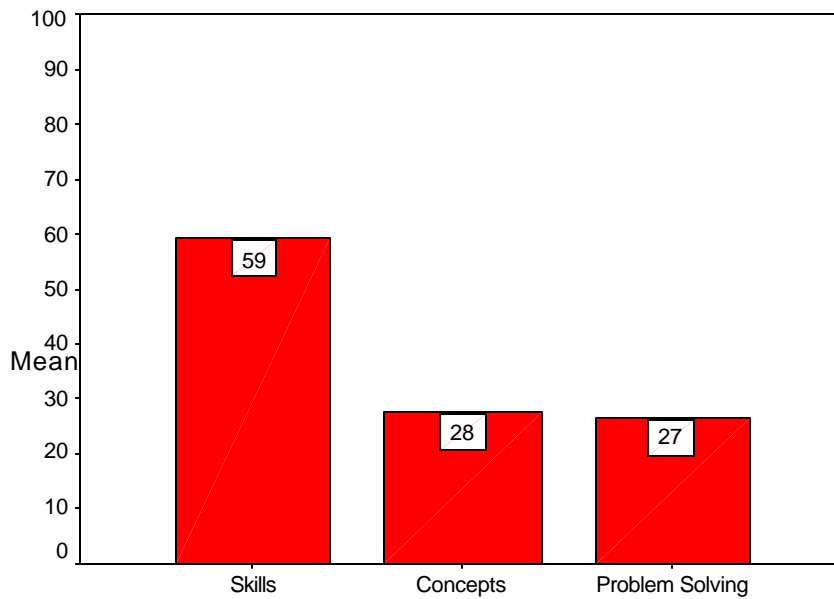


Figure 4

Eighth Grade Mathematics



New Standards Reference Exams: Spring 1997

Figure 5

# Basic Reading

## Grade 4

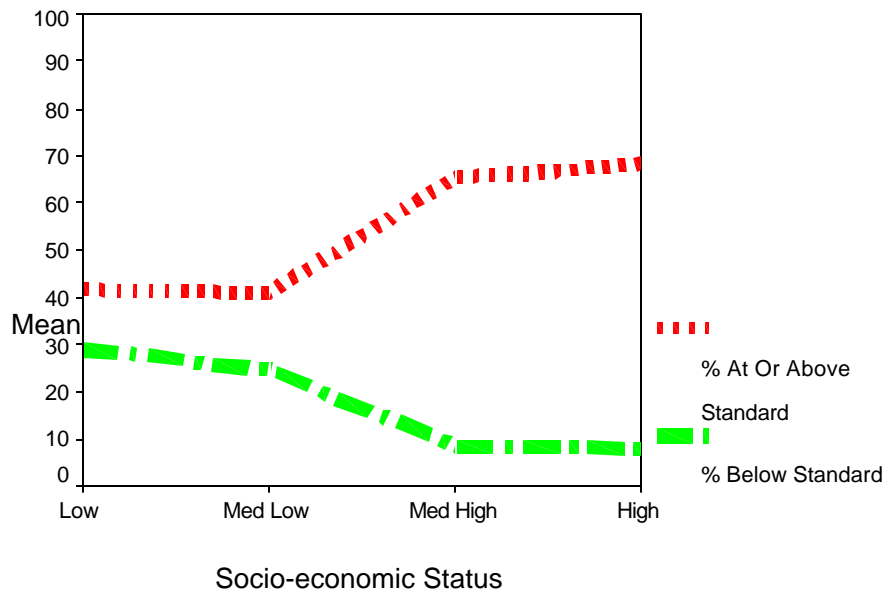


Figure 6

## Grade 4

### Reading Analysis

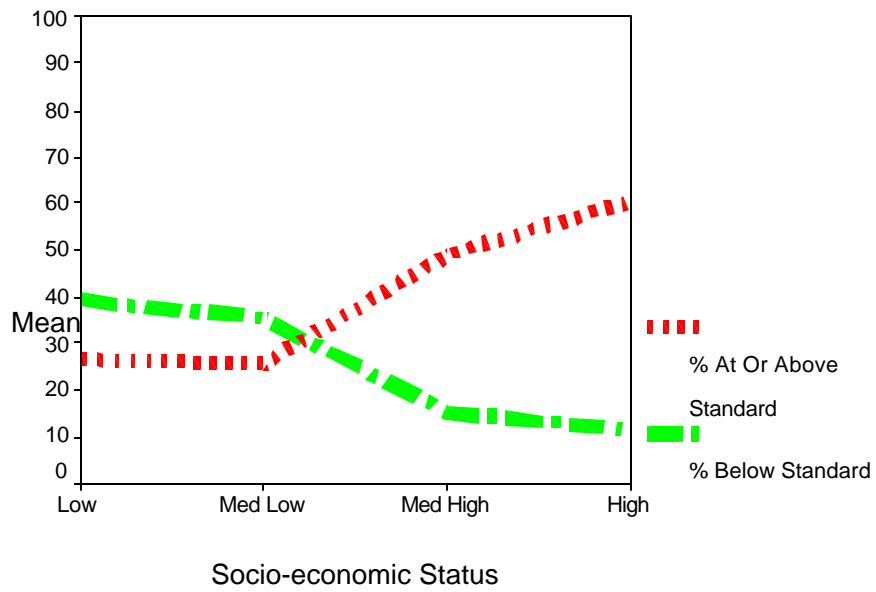


Figure 7



# Writing Content

## Grade 4

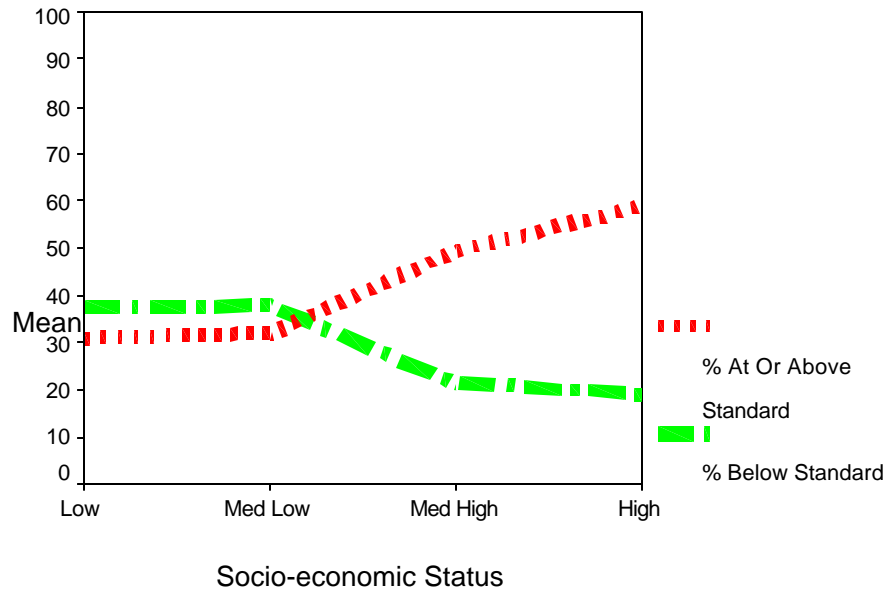
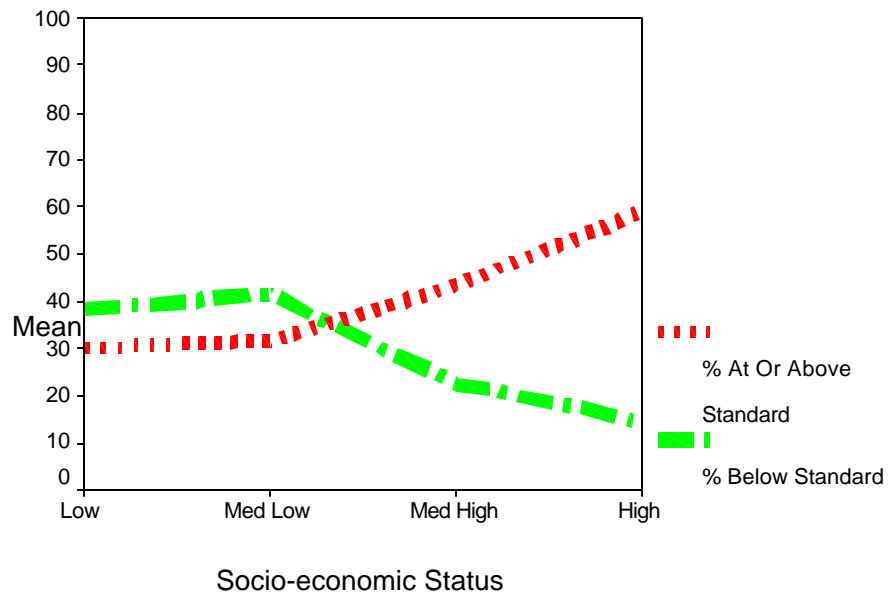


Figure 8

# Writing Conventions

## Grade 4



*Figure 9*

# Math Skills

## Grade 4

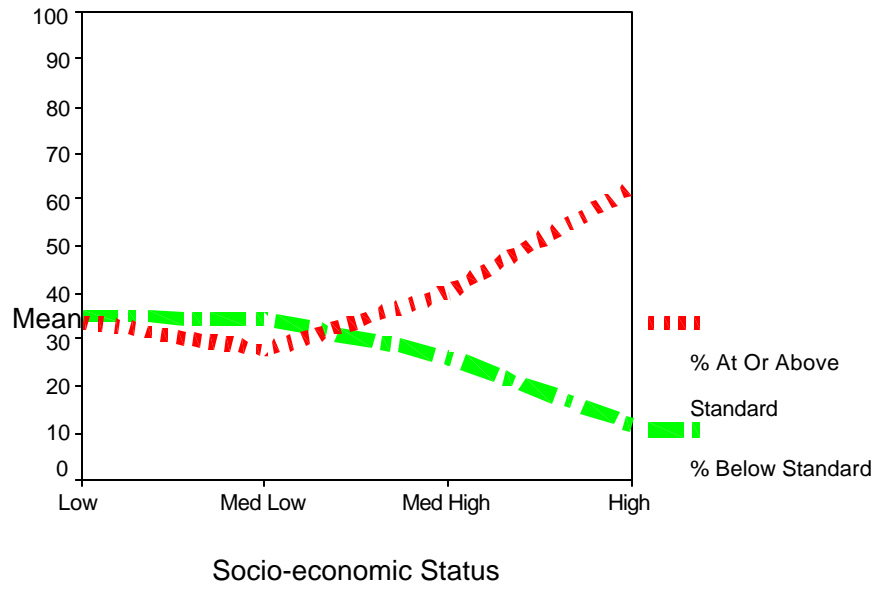


Figure 10

# Math Concepts

## Grade 4

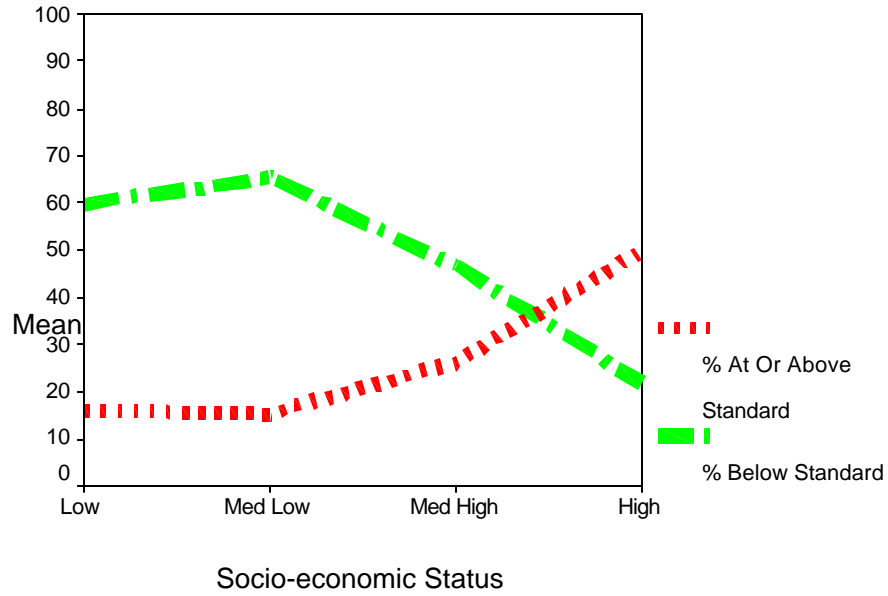


Figure 11



# Math Problem Solving

## Grade 4

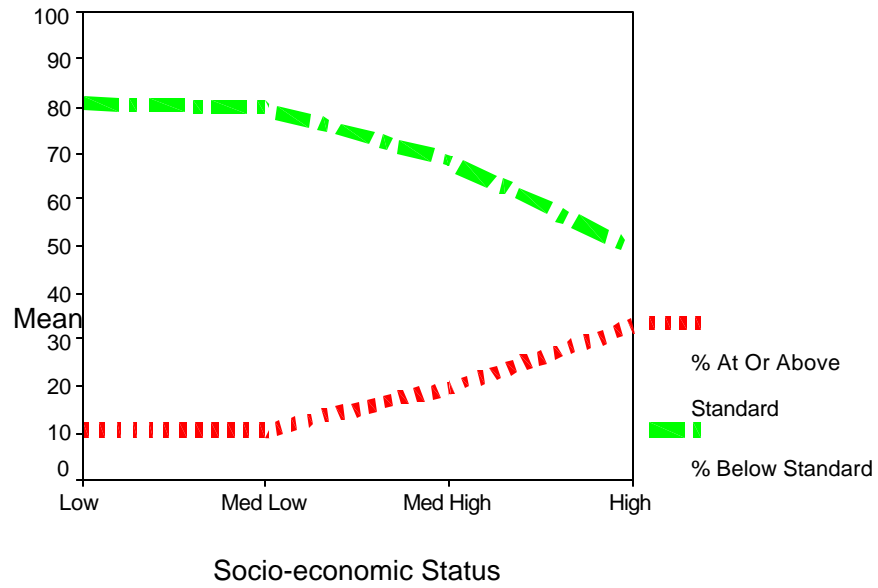
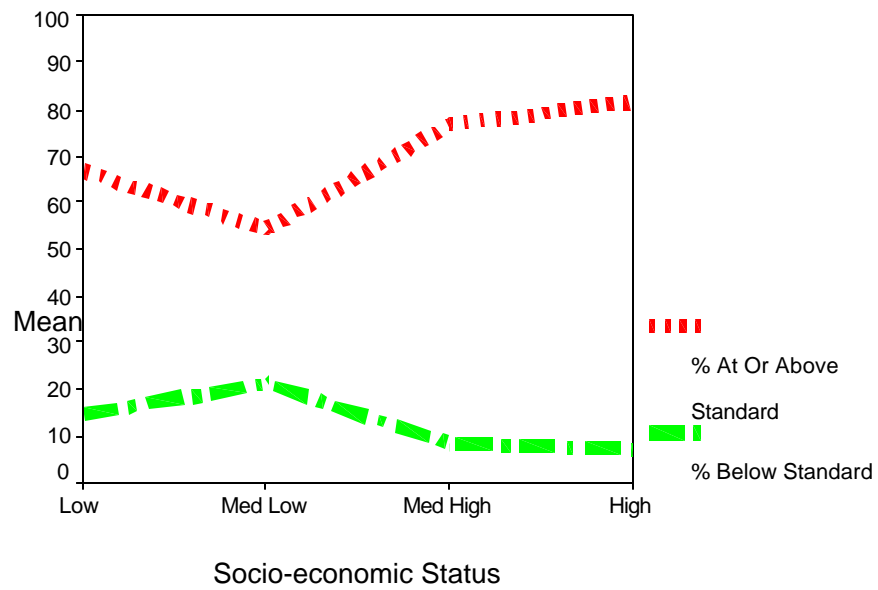


Figure 12

# Basic Reading

## Grade 8



*Figure 13*

# Reading Analysis

## Grade 8

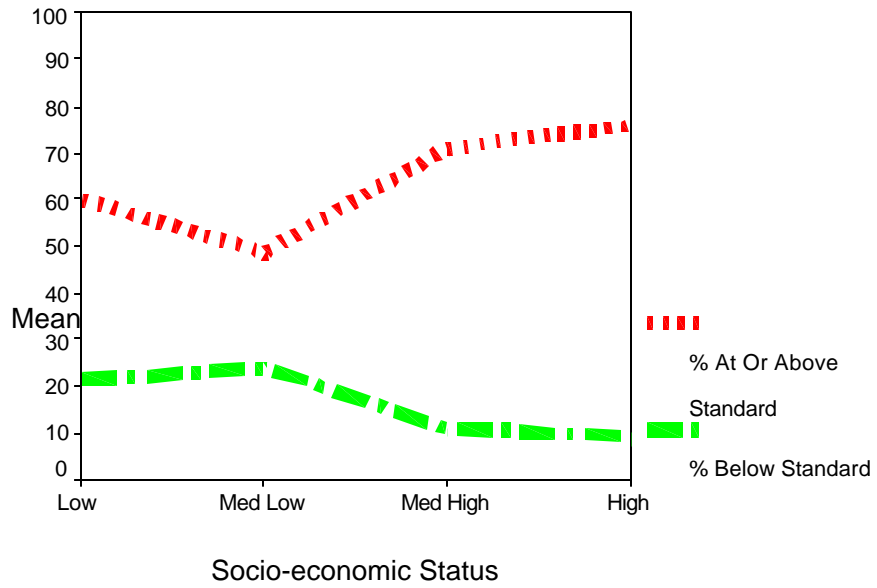
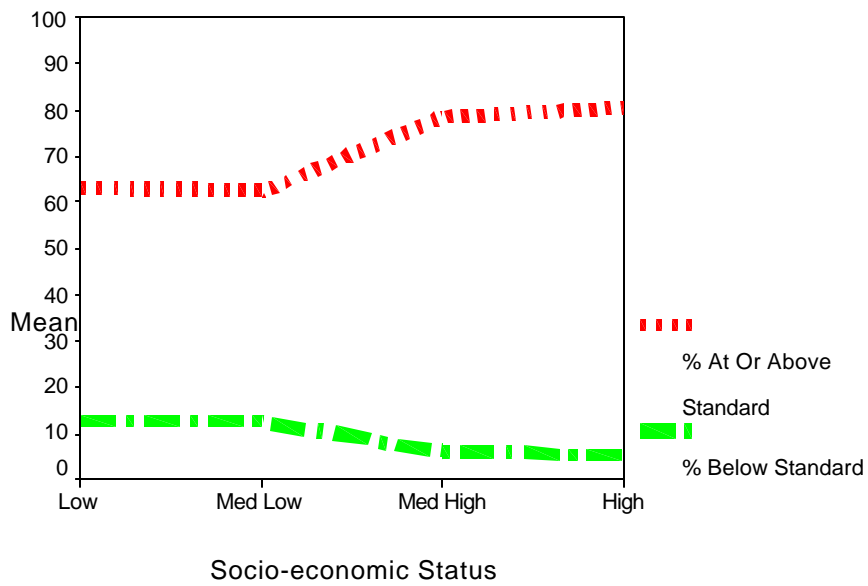


Figure 14

# Writing Content

## Grade 8



*Figure 15*

# Writing Conventions

## Grade 8

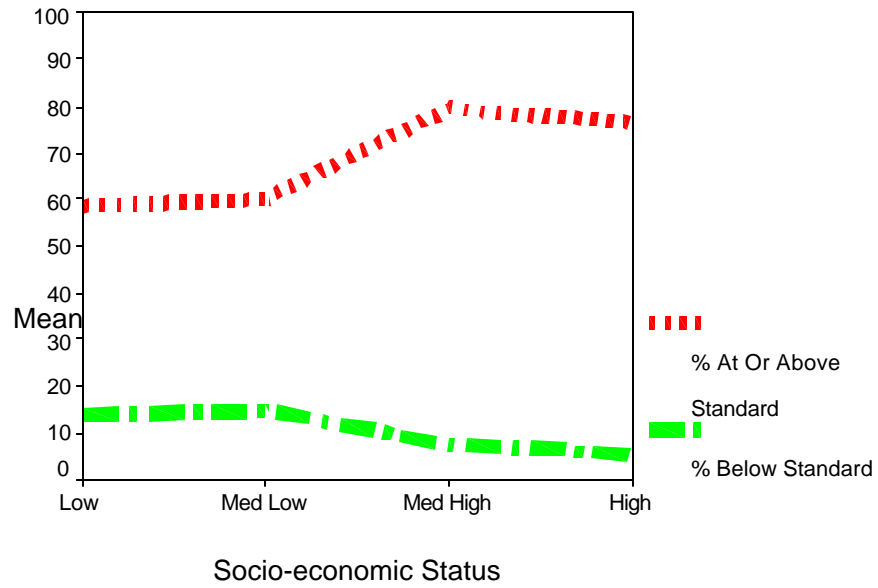


Figure 16

# Math Skills

## Grade 8

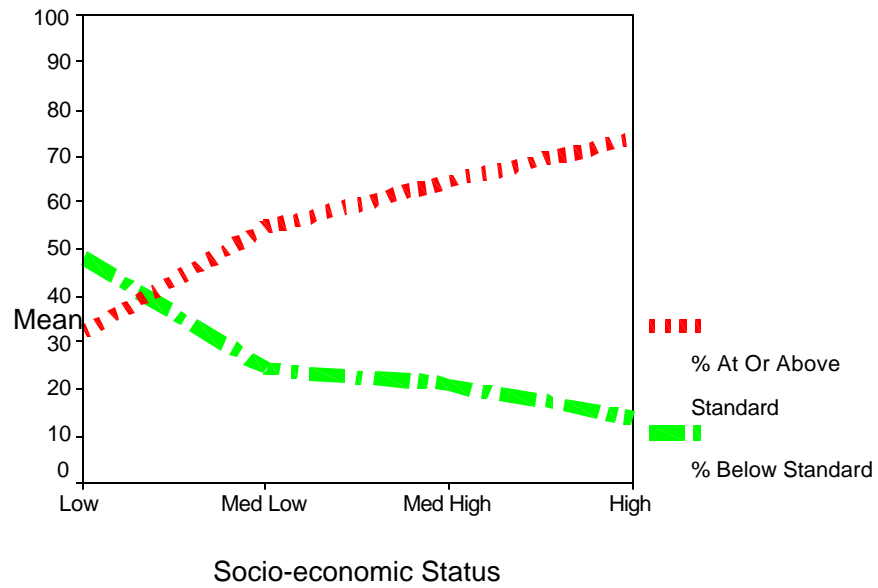


Figure 17



# Math Concepts

## Grade 8

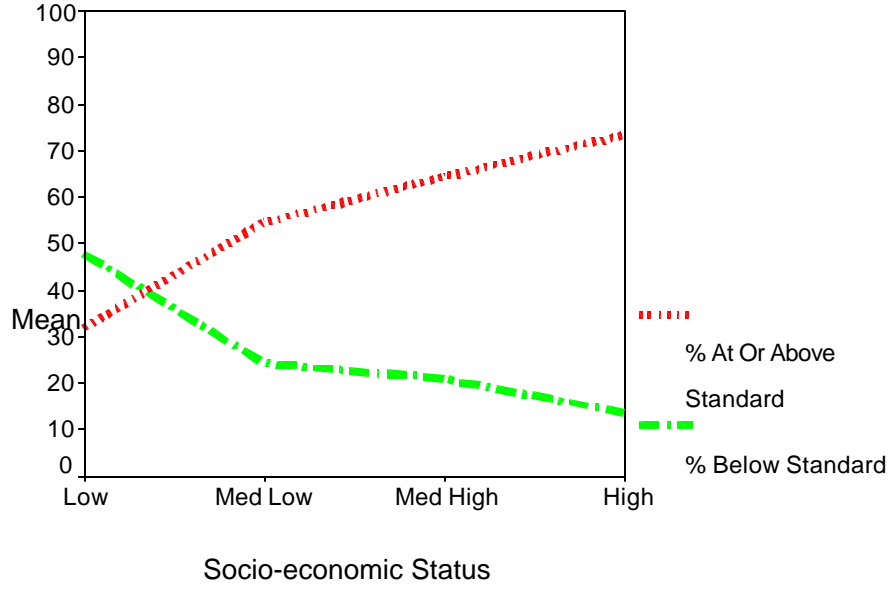


Figure 18

# Math Problem Solving

## Grade 8

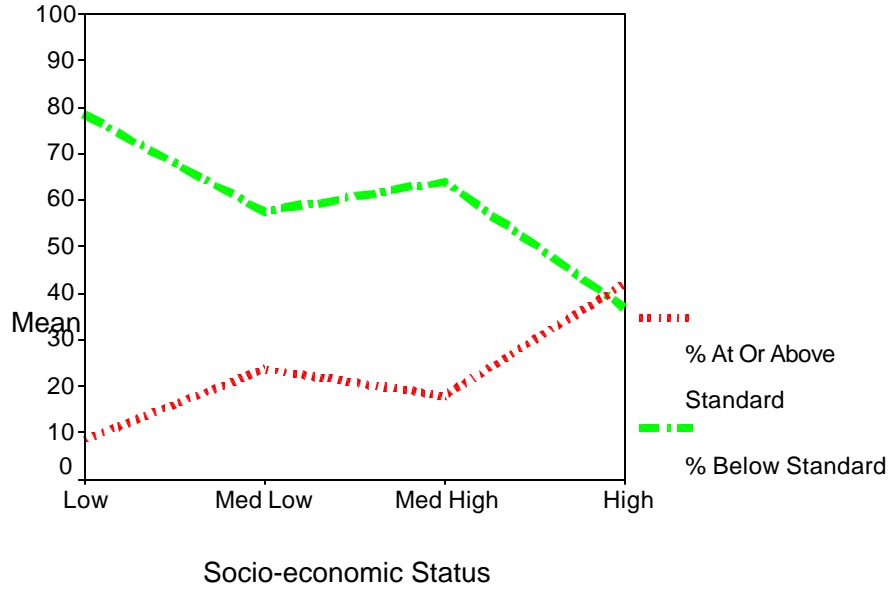


Figure 19

# Basic Reading

## Grade 4

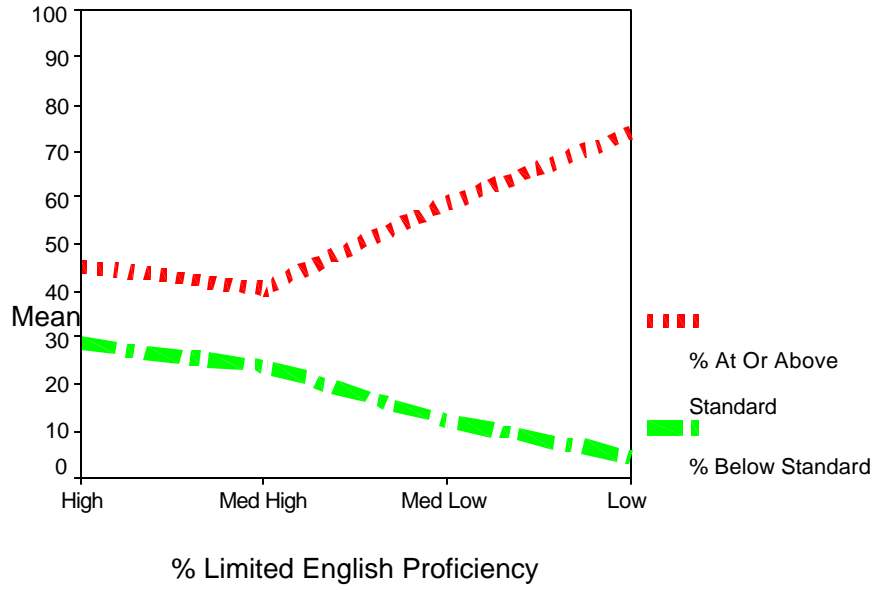


Figure 20

# Reading Analysis

## Grade 4

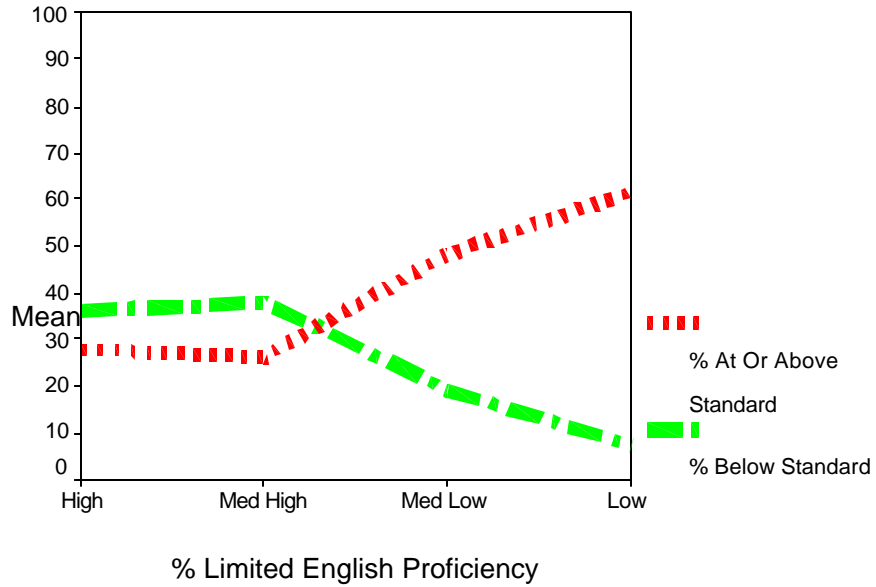


Figure 21

## Writing Content

### Grade 4

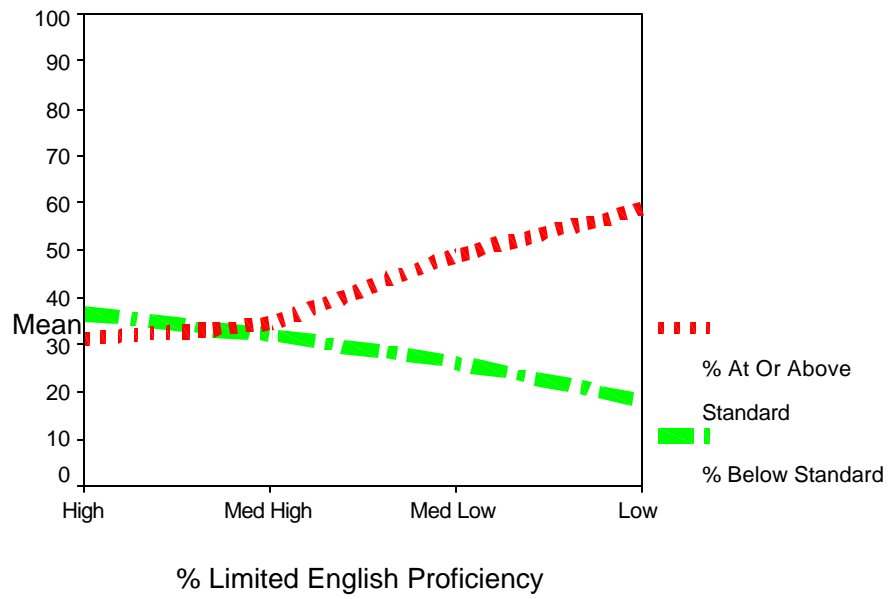


Figure 22

## Writing Conventions

### Grade 4

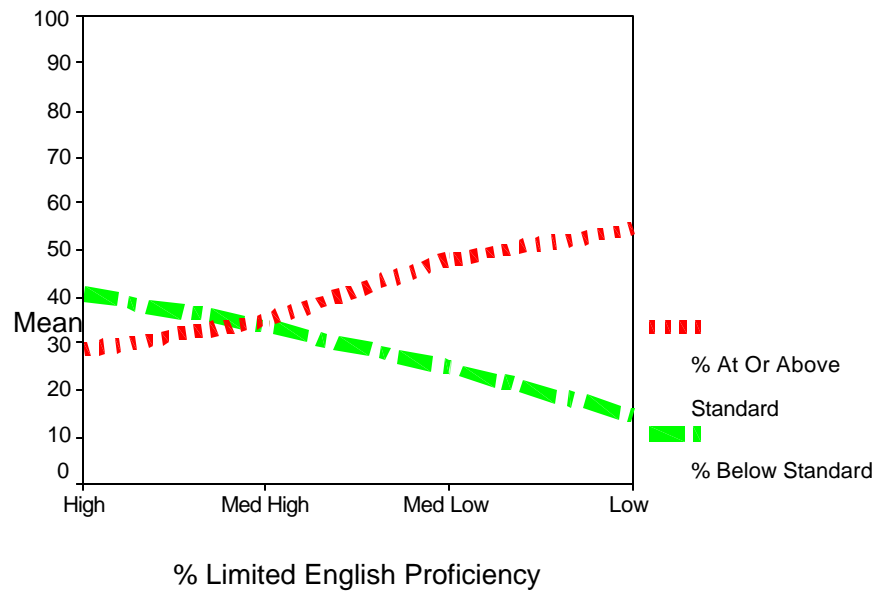


Figure 23



# Math Skills

## Grade 4

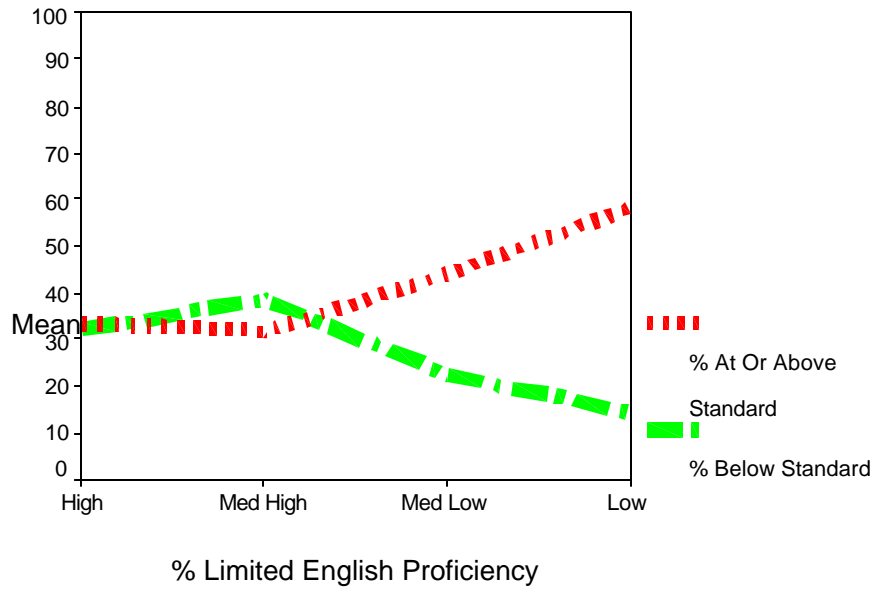


Figure 24

# Math Concepts

## Grade 4

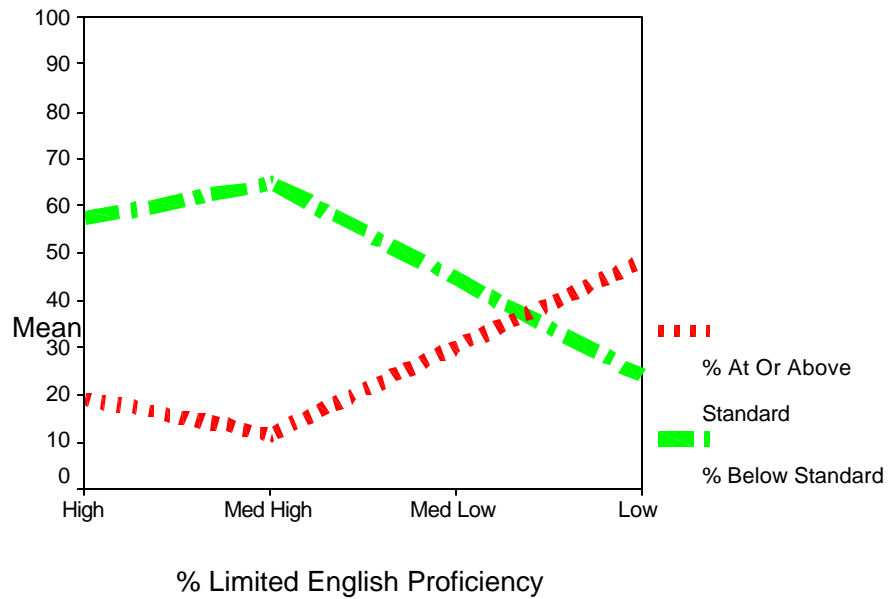


Figure 25



# Math Problem Solving

## Grade 4

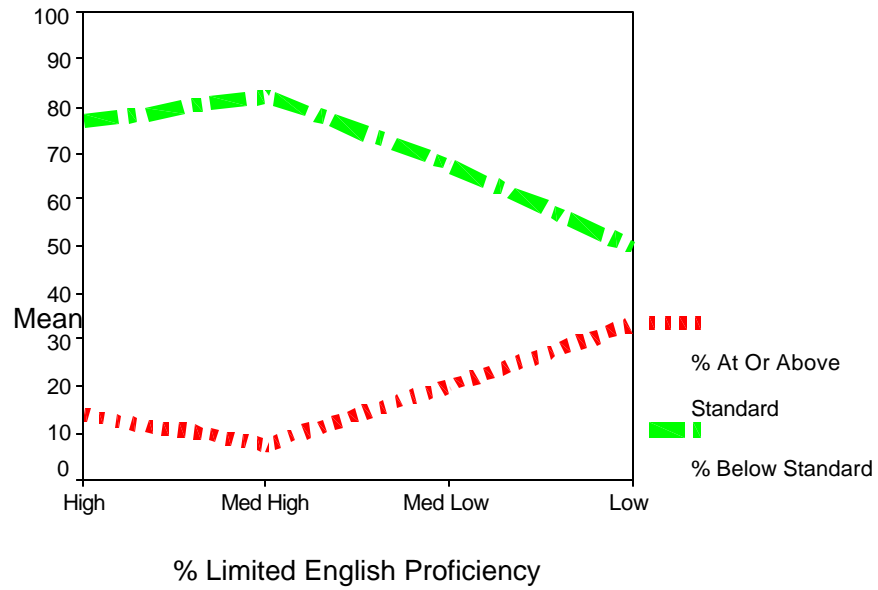
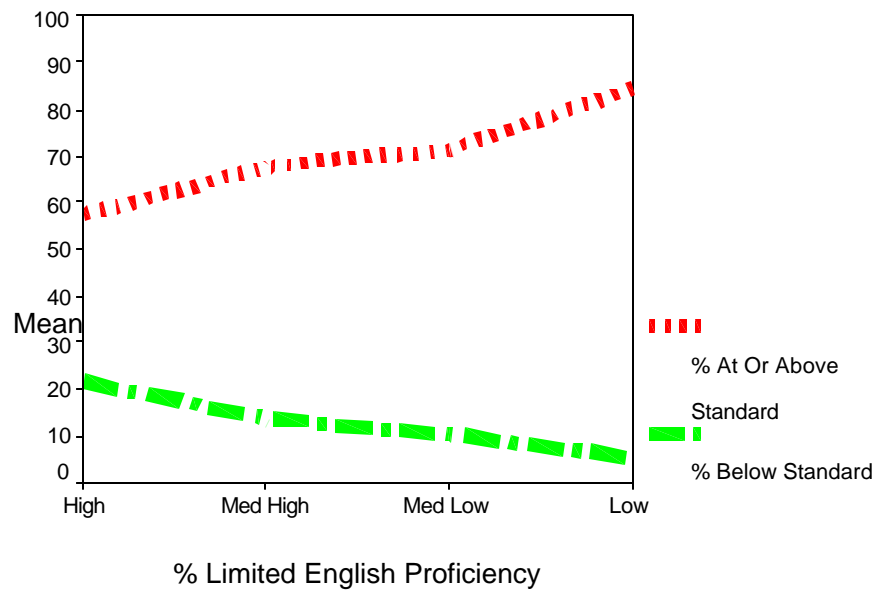


Figure 26

# Basic Reading

## Grade 8



*Figure 27*

# Reading Analysis

## Grade 8

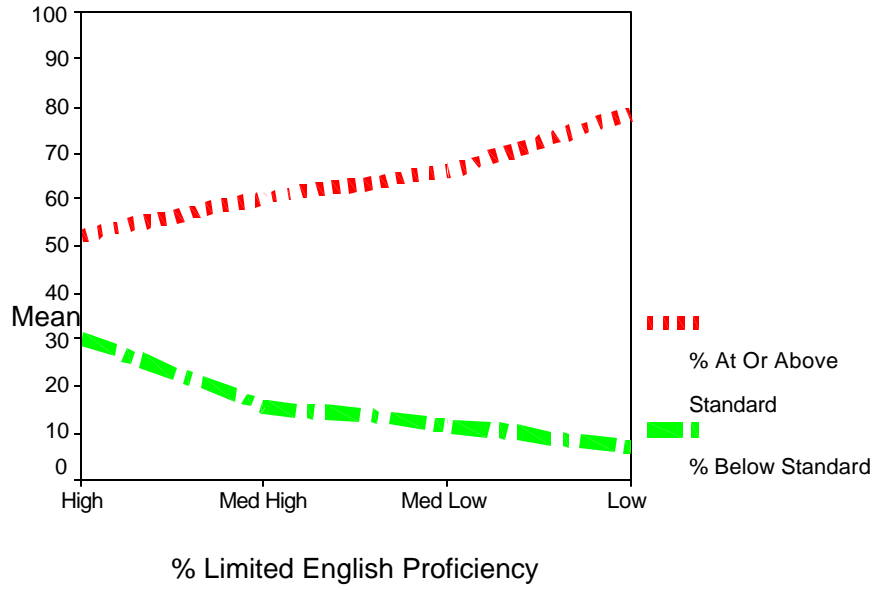


Figure 28

# Writing Content

## Grade 8

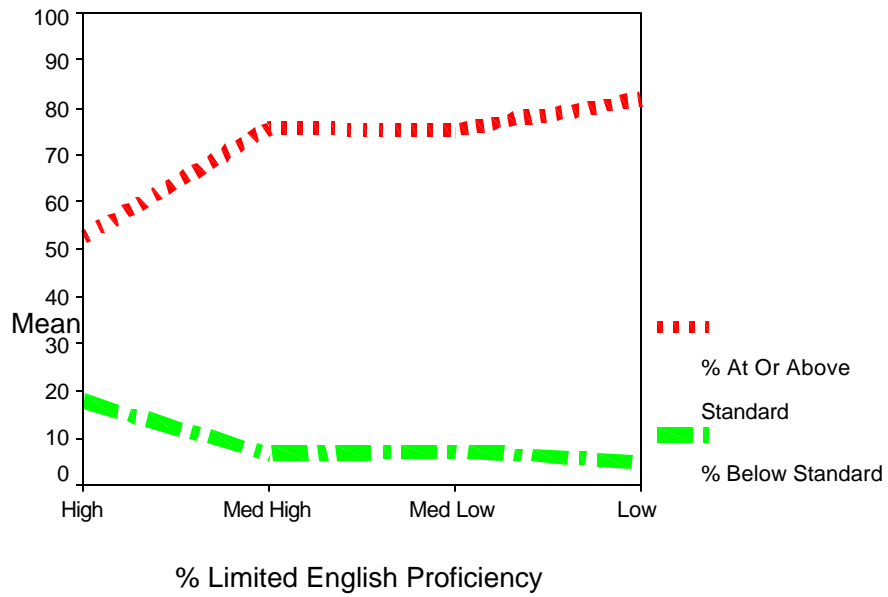


Figure 29

# Writing Conventions

## Grade 8

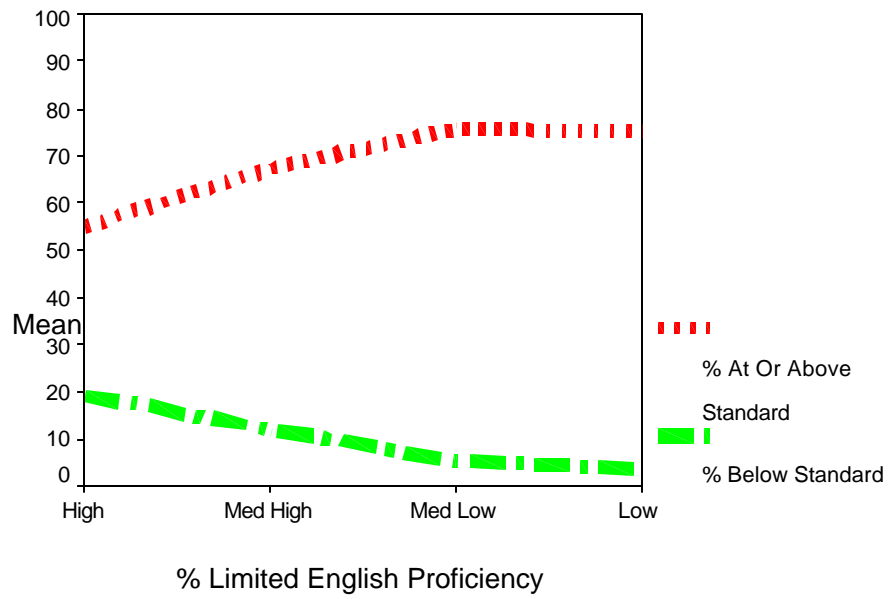


Figure 30

# Math Skills

## Grade 8

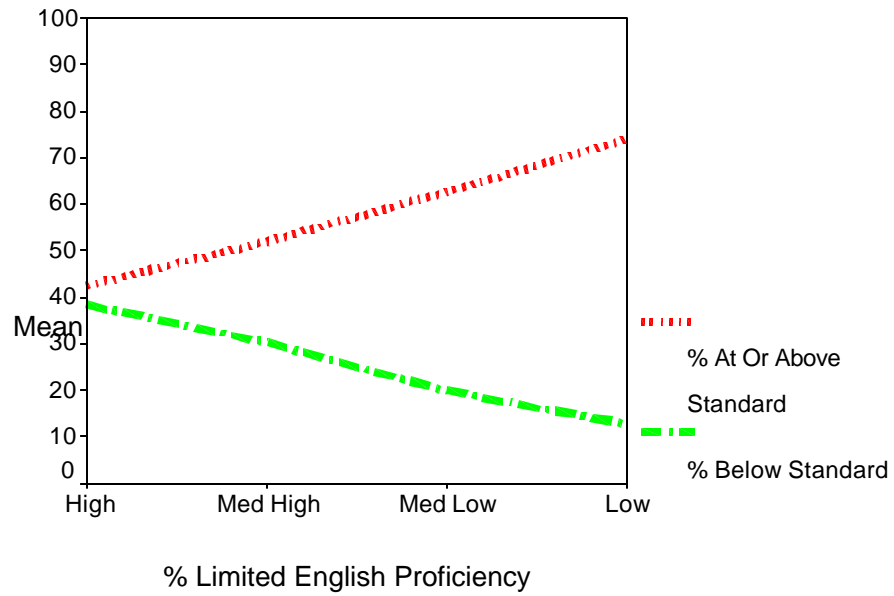


Figure 31

# Math Concepts

## Grade 8

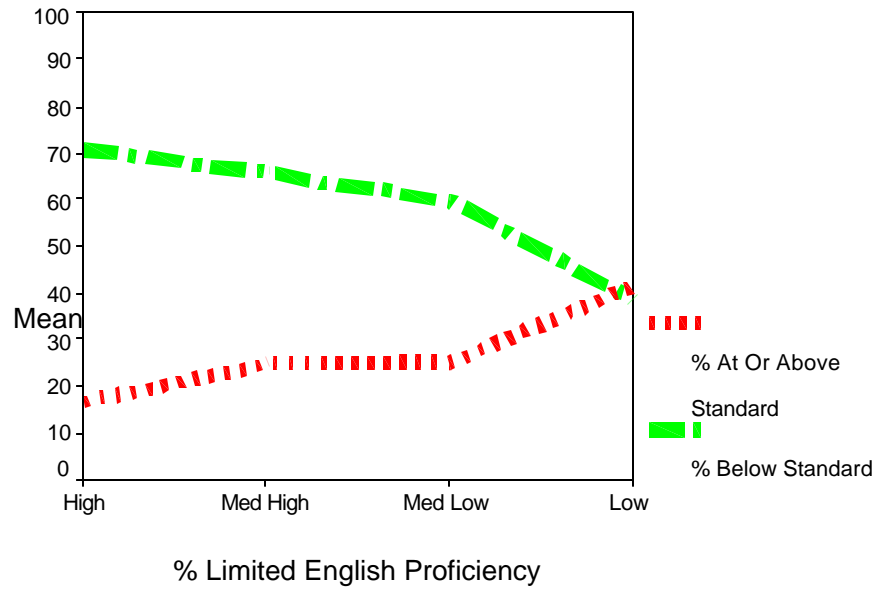


Figure 32

# Math Problem Solving

## Grade 8

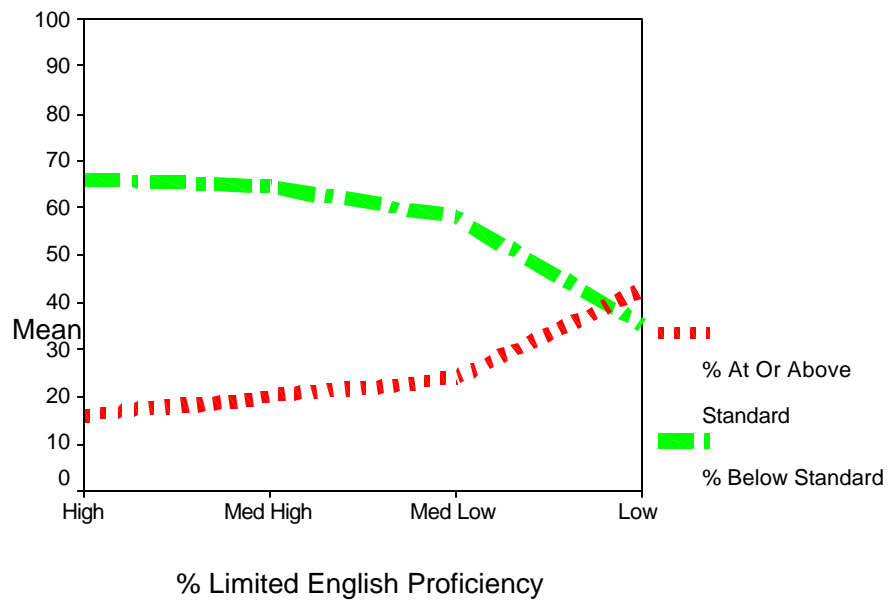


Figure 33



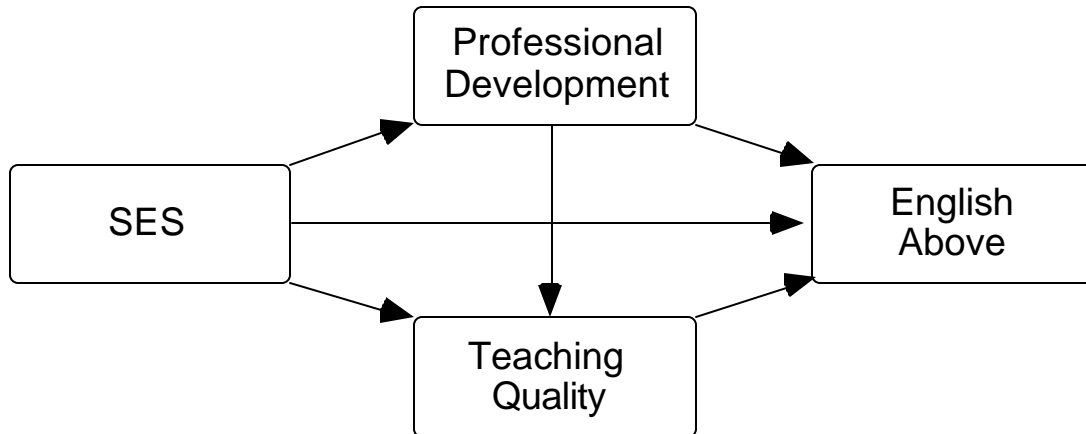


Figure 35: Path model for the relationship between Teaching Quality, Professional Development and Achievement

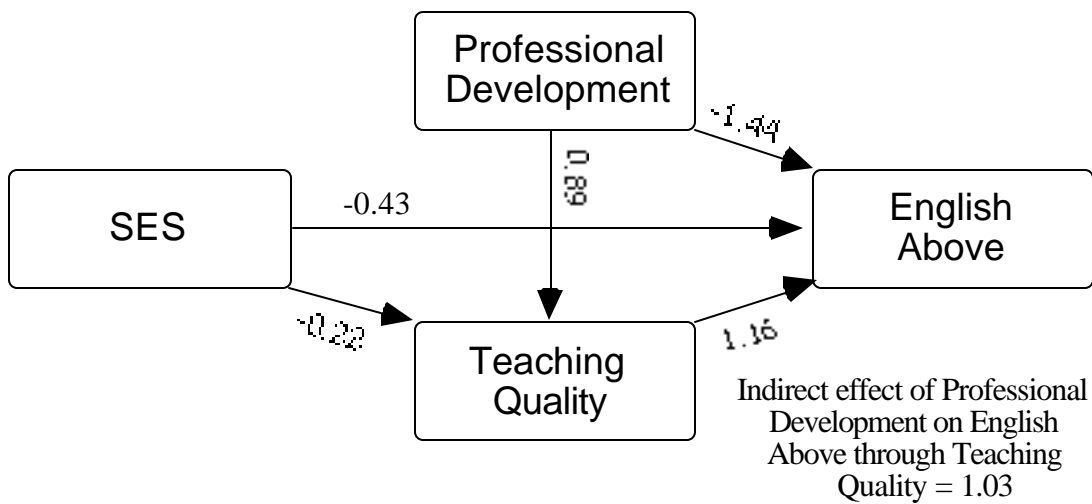


Figure 36: Path analytic results for the relationship between Teaching Quality, Professional Development and Achievement  
All reported standardized path coefficients were significant at the .05 level