

**Impact of the  
Payne School Model  
on Student Achievement**

**Hutchinson Public Schools  
Hutchinson, Kansas**

**Second-Year Report:  
2005-06 Data**

**William W. Swan, Ed.D.,  
The University of Georgia  
Athens, GA.**

*Center for Study of*  
**ECONOMIC  
DIVERSITY**

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**Abstract**

*Using the 2005–06 Kansas Mathematics and Reading Assessments in Grades 3–6 as dependent variables, two analytical approaches were used to determine the impact of the Payne School Model on student achievement using a post-test-only design with two groups—students served by teachers demonstrating a High Model Fidelity (HMF) and students served by teachers not demonstrating a high level of model fidelity (Other) and a graphing procedure focused on levels of proficiency. Two of the three analyses of covariance (ANCOVA) were statistically significant—Grade 6 Mathematics and Grade 6 Reading. Both results favored the HMF group. Two of the five analyses of variance (ANOVA) were statistically significant—the Grade 5 Reading favored the HMF group, and the Grade 3 Mathematics favored the Other group. A third approach was used with 2002–06 Kansas Mathematics and Reading Assessments for Grades 6–11 as performance variables. The data were graphed and demonstrated increases in the percentages of students from poverty who achieved at or above the Proficient level in Reading and Mathematics. Officials in the school district strongly believe that the implementation of the Payne School Model contributed very significantly to these increases in student performance.*

**For more information please contact: Center for Study of Economic Diversity, PO Box 665, Highlands, TX 77562, 800-468-9950 (phone), 281-426-6930 (fax).**

## ***Introduction and Purpose***

The federal No Child Left Behind Act of 2001 (as amended) and corresponding state legislation throughout the United States require that public schools use “research based” programs to increase student achievement in all academic areas, with emphasis on Mathematics and Reading/English/Language Arts. Consistent with these mandated foci on student achievement, Dr. Ruby K. Payne implemented a research agenda to determine the impact of the Payne School Model—*A Framework for Understanding Poverty, Learning Structures, and Meeting Standards & Raising Test Scores* materials and training—on student achievement in the areas of Mathematics and Reading/English/Language Arts.

## ***Context for Hutchinson Public Schools***

In the 2005-06 school year, 4,772 students were enrolled in Hutchinson Public Schools: eight elementary schools, one middle school with two campuses, and one high school. The elementary schools serve 2,552 students, while the middle schools and high school serve 2,220 students. Each elementary site serves preschool–Grade 6; one middle school serves seventh grade, and one serves eighth grade; and the high school serves Grades 9–12. All of the schools in the district have worked with aha! Process, Inc. to implement the strategies and concepts taught in its training. The eight elementary schools were originally identified as research sites.

### *Avenue A Elementary*

Avenue A Elementary School is a preschool–Grade 6 campus with an enrollment of 249 students. The current student population is 54% Hispanic, 38% Caucasian, 3% African American, and 4% Other. Ninety percent of the students are identified as economically disadvantaged.

An aha! Process consultant provided four technical-assistance sessions to the teachers, who met with the consultant by grade level for approximately four hours total. During the 2005–06 year, technical-assistance sessions focused on:

- Interventions for students not reaching proficiency on state assessments
- Plan and label activities
- Discipline strategies
- Mental models, phonics, and Tucker Signing Strategies
- Language arts time and content grids
- Text structure
- Math mental models

### *Faris Elementary*

Faris Elementary School has an enrollment of 251 students. The current student population is 82% Caucasian, 8% Hispanic, 7% African American, and 3% Other. Seventy-five percent of the students are identified as economically disadvantaged.

An aha! Process consultant provided four technical-assistance sessions to the teachers, who met with the consultant by grade level for approximately four hours total. During the 2005–06 year, technical-assistance sessions focused on:

- Reviewing critical indicators included on the *Instructional Framework Scale—Observation*
- Reviewing all elements of the Payne Lesson Design
- Discussing the importance of time management in the classroom, including the payoff
- Reviewing mental models that could be used to teach target standards
- Identifying strategies to enhance Reading and Vocabulary Development
- Targeting students for intervention

### *Graber Elementary*

Graber Elementary School has an enrollment of 366 students. The current student population is 78% Caucasian, 12% Hispanic, 4% African American, and 6% Other. Forty-three percent of the students are identified as economically disadvantaged.

An aha! Process consultant provided four technical-assistance sessions to the teachers, who met with the consultant by grade level for approximately four hours total. During the 2005–06 year, technical-assistance sessions focused on:

- Reviewing discipline strategies
- Incorporating mental models into lessons
- Incorporating step sheets into lessons
- Using registers of language, developing knowledge of hidden rules, and using the adult voice instead of the child or parent voice
- Reviewing the Payne Lesson Design and the *what, why, and how* of learning
- Establishing interventions for students in the lower two quartiles
- Reviewing the time and content grid process included in *Meeting Standards* training

### *Hutchinson Magnet School at Allen Elementary*

Hutchinson Magnet School at Allen Elementary School is a campus with an enrollment of 294 students. The current student population is 74% Caucasian, 12% Hispanic, 11% African American, and 3% Other. Fifty-eight percent of the students are identified as economically disadvantaged.

An aha! Process consultant provided four technical-assistance sessions to the teachers, who met with the consultant by grade level; this accounted for approximately four hours total. The focus of these technical-assistance sessions included:

- Reviewing time and content grid process
- Beginning the time and content grid process for language arts
- Determining the quarter to assess grade-level concepts
- Reviewing discipline strategies
- Discussing the behavior analysis and its relation to students' resources

### *Lincoln Elementary*

Lincoln Elementary School has an enrollment of 192 students. The current student population is 61% Caucasian, 18% African American, 16% Hispanic, and 5% Other. Eighty-one percent of the students are identified as economically disadvantaged.

An aha! Process consultant provided four technical-assistance sessions to the teachers, who met with the consultant by grade level for approximately four hours total. During the 2005-06 year, technical-assistance sessions focused on:

- Reviewing and demonstrating the process for gridding student test scores
- Discussing the importance of step sheet implementation and procedures to connect academic and behavioral success for students
- Focusing on both casual register and formal register, as well as strategies to increase students' understanding of the language registers

### *McCandless Elementary*

McCandless Elementary School is a campus with an enrollment of 430 students. The current student population is 73% Caucasian, 13% Hispanic, 10% African American, and 4% Other. Seventy-eight percent of the students are identified as economically disadvantaged.

An aha! Process consultant provided four technical-assistance sessions to the teachers, who met with the consultant by grade level for approximately four hours total. During this time, technical-assistance sessions focused on:

- Gridding data by quartiles
- Identifying interventions to address needs of students in lower quartiles
- Reviewing discipline strategies, including appropriate use of the child, parent, and adult voices, behavior analysis, and nonverbal assists.
- Presenting to the new teachers the instructional strategies included in *Learning Structures* training
- Beginning the time and content grid process for language arts
- Identifying the quarter to assess grade-level concepts
- Creating step sheets for tasks

### *Morgan Elementary*

Morgan Elementary School has an enrollment of 454 students. The current student population is 87% Caucasian, 6% Hispanic, 4% African American, and 3% Other. Thirty-four percent of the students are identified as economically disadvantaged.

An aha! Process consultant provided four technical-assistance sessions to the teachers, who met with the consultant by grade level for approximately four hours total. The focus of these sessions included:

- Reviewing time and content grid process
- Beginning the time and content grid process for language arts

- Reviewing discipline strategies, including appropriate use of the child, parent, and adult voices, behavior analysis, and nonverbal assists
- Reviewing strategies to teach vocabulary
- Presenting mental models for time, connecting the lack of understanding students have of time to behavior concerns in the classroom
- Determining the quarter to assess grade-level concepts

### *Wiley Elementary*

Wiley Elementary School has an enrollment of 333 students. The current student population is 91% Caucasian, 4% Hispanic, 2% African American, and 3% Other. Forty-four percent of the students are identified as economically disadvantaged.

An aha! Process consultant provided four technical-assistance sessions to the teachers, who met with the consultant by grade level for approximately four hours total. The technical-assistance sessions focused on:

- Reviewing discipline strategies and school climate
- Reviewing the child, parent, and adult voice information
- Focusing on the inclusion of step sheets and written plans in instruction
- Reviewing scores in Reading
- Identifying mental models to teach the weakest standards
- Reviewing key elements of the *Framework* training with first-year teachers
- Focusing on classroom practices, procedures, and voices to strengthen discipline
- Reviewing data grids
- Discussing links between data analysis, time and content grids, and interventions

### *Secondary Schools*

Hutchinson Middle School's seventh-grade campus and eighth-grade campus and Hutchinson High School have a total enrollment of 2,220 students. The current student population at the two middle schools is 77% Caucasian, 14% Hispanic, 8% African American, 1% American Indian/Alaskan Native, and <1% Asian/Pacific Islander. Fifty-four percent of the students are designated as economically disadvantaged. At the high school the current student population is 81% Caucasian, 11% Hispanic, 6% African American, 1% Asian/Pacific Islander, and <1% American Indian/Alaskan Native. Thirty-seven percent of the students are designated as economically disadvantaged. The content-specific consultants from aha! Process provided four technical-assistance sessions per year in each content area during the first two years of the project. Secondary Mathematics, English, Science, and Social Studies teachers met with the content-area consultants for an average of 26 hours during the 2004–05 and 2005–06 school years. The sessions focused on:

- Discussing grading practices
- Doing resource analysis
- Identifying students and interventions
- Reviewing resources, registers, input strategies, resources, hidden rules, language, discipline, family structure, and relationships
- Creating time and content grids, mental models, and step sheets

## ***Methodology***

The approach to determine impact of the Payne School Model on student achievement had three dimensions.

The first was establishing the level of model fidelity for teachers at each school. If teachers were not implementing the Payne School Model effectively, differences in student achievement could not be attributed to its use.

The second was determining the statistical significance of the impact of the Payne School Model on student achievement in Mathematics and Reading by using a post-test-only comparison design for two groups—students of those teachers using the model at a high level of model fidelity (HMF) and students of those teachers who were not using the model at a high level of model fidelity (Other). The preferred statistical analysis to compare the two groups was the analysis of covariance which statistically equalizes the two groups, based on prior performance from standardized tests, and then analyzes the relative student achievement over time. This procedure controls for multiple internal threats to research validity and was used with students in Grades 5 and 6 who had prior standardized test scores. When this procedure was not possible because no prior performance on standardized tests was available, an analysis of variance was used to analyze the post tests between the two groups without any statistical correction for prior performance.

The third was a longitudinal examination of the progress of groups of students from poverty in secondary grades (middle and high school) over time in the areas of Reading and Mathematics. The variable used in this examination is the percentage of students at or above Proficient (No Child Left Behind Act of 2001) on state standardized tests; different groups of students in a grade are graphed over successive years. Many state education agencies and local school districts use this approach to describe progress over time in reducing performance gaps between comparative groups, e.g., students from poverty vs. students not from poverty.

### ***Model Fidelity***

The *Instructional Framework Scale—Observation* (2003) consists of 47 indicators criterion-referenced to key model components/activities. The aha! Process consultants used this instrument to determine a teacher's level of model fidelity in implementing the Payne School Model. The median inter-rater reliability for this instrument is .83 (83%) with a range of .72 (72%) to .95 (95%).

### ***Analysis of Student Achievement Data***

A post-test-only comparison design for two groups was used. The two groups of students served by teachers with a High Model Fidelity (HMF) [.40 (40%) or higher on the *Instructional Framework Scale—Observation*] vs. students served by teachers with a model fidelity of .39 (39%) or lower on the scale (Other). Analyses were conducted by grade across the eight elementary schools. The independent variable was the level of implementation of the Payne School Model (HMF or Other). The dependent variables were standardized test scores on the

Kansas Mathematics Assessment and the Kansas Reading Assessment in 2005–06. [See the following website for more information on the Kansas Assessment and Accountability Reports: [www.ksde.org/assessment](http://www.ksde.org/assessment); [www.ksde.org/accountability](http://www.ksde.org/accountability).] The analysis of covariance was used for Grades 5 and 6; the covariates were the prior test scores in the same domains (e.g., Mathematics for Mathematics) in a prior grade. Analyses were conducted by grade across the elementary schools. For the analyses of covariance, disaggregation analyses were conducted using the five NCLB disaggregation areas of gender, race, fluency, poverty status, and IDEA (Individuals with Disabilities Education Act of 2004) disability when there were sufficient sample sizes in the disaggregations. The analysis of variance was used for Grades 3–5 (Reading); no covariates were available, as standardized tests were not required for these grades in prior years. The results of the analysis of covariance are more meaningful than the results of analysis of variance because the former statistically equalized the two groups before comparing student achievement in 2005–06. The results of the analysis of variance are more suggestive in nature due to this limitation.

### *Longitudinal Analysis of Secondary Students from Poverty*

Three graphs were developed for the years 2002 through 2006 for the percentage of students at or above Proficient groups for middle school and high school students from poverty (see Figures 1–3). The middle school included students from Grade 8 in Reading and Grade 7 in Mathematics for the years 2002–05; both grades were combined for 2006.

The high school included two parts. First, two groups of Grade 10 students—all Grade 10 students vs. Grade 10 students from poverty—were compared from 2003 through 2006. Second, students from poverty in Grade 11 for Reading and Grade 10 for Mathematics were compared from 2002 through 2006. All of these combinations of grades and content areas were based on required state testing procedures in the years studied. The Payne School Model was implemented with these students beginning in school year 2005.

## **Results**

The results are presented in three sections—model fidelity, student achievement, and longitudinal study of secondary students from poverty.

### *Model Fidelity*

Consultants from aha! Process used the *Instructional Framework Scale—Observation* (2003) to observe teachers and assess their level of implementation of the model. Teachers were assessed at all eight elementary schools; the number of teachers per school ranged from three to nine and focused on teachers who appeared to be implementing the model effectively. The results of these observations are as follows:

- Twelve of the 47 teachers met or exceeded the criterion of 40%.
- Four of the 12 teachers who met criterion taught Kindergarten or Grades 1 or 2—which did not participate in Kansas standardized tests in 2005–06.
- The eight teachers, meeting criterion in Grades 3–6, were as follows: two in Grade 3, four in Grade 4, one in Grade 5, and one in Grade 6.

## *Student Achievement*

Tables 1 and 2 (Appendix) contain summaries of the statistical analyses for Mathematics and Tables 3 and 4 (Appendix) contain summaries of the statistical analyses for Reading.

**Mathematics** – The analyses of covariance (ANCOVA) results for Mathematics for the High Model Fidelity (HMF) group vs. the Other group are as follows (see Table 1):

- Grade 5: The result was not statistically significant but favored the Other group.
- Grade 6: The result was statistically significant and favored the HMF group.

The analyses of variance (ANOVA) results for Mathematics for the HMF group vs. the Other group are contained in Table 3. For Grade 3 the result was statistically significant and favored the Other group. For Grade 4 the result was not statistically significant and favored the Other group.

**Reading** – The analysis of covariance (ANCOVA) result for Reading/English/Language Arts for the High Model Fidelity (HMF) group vs. the Other group is as follows (see Table 3):

- Grade 6 (one HMF teacher): The result was statistically significant and favored the HMF group.

The analyses of variance results for Reading for the High Model Fidelity (HMF) group vs. the Other group are contained in Table 4. For Grade 3 the result was not statistically significant but favored the Other group. For Grade 4 the result was not statistically significant but favored the Other group. For Grade 5 the result was statistically significant and favored the HMF group.

Two of the three analyses of covariance were statistically significant beyond the  $p < .01$  level; the HMF group outperformed significantly more effectively on both the Mathematics and Reading standardized tests in Grade 6 than the Other group. None of the analyses based on disaggregations was statistically significant, indicating that the Payne School Model had consistent impact across gender, race, LEP (limited English proficiency), poverty status, and IDEA disability.

Two of the five analyses of variance were statistically significant. Grade 3 Mathematics was significant at the  $p < .09$  level but favored the Other group; Grade 5 Reading was significant at the  $p < .02$  level and favored the HMF group. While these results suggest there may be some differences between the performance of the groups, these results must be interpreted with caution because there was no statistical equalization of the groups based on prior performance.

## *Longitudinal Study of Secondary Students from Poverty*

For the four groups of middle school students studied over the four-year period (see Figure 1), the percentage of students at or above Proficient generally increased for both Reading (students in eighth grades) and Mathematics (students in seventh grades) over the four-year period. With the implementation of the Payne School Model in 2005, there was about a 5-point decrease in the percentage of students at or above Proficient for both Reading and

Mathematics; such decreases in the first year of model implementation are not unusual. In 2006 the students from poverty in both seventh and eighth grades were combined, consistent with state testing procedures; there was a significant increase (14–19 points) in the percentage of students from poverty at or above Proficient level for Reading and Mathematics. The percentages in 2006 were the highest over the five-year period.

For the four groups of Grade 10 students over the 2003–06 period (see Figure 2), the percentage of students at or above Proficient increased significantly over the four-year period for both the total groups and the students from poverty groups, with the student from poverty groups making very significant growth. The gaps between the total groups of students at Grade 10 and the groups of students from poverty at Grade 10 were reduced, with the final result in 2006 showing only a 1% difference.

For the five groups of 10<sup>th</sup>- and 11<sup>th</sup>-grade students from poverty studied over the 2002–06 period (see Figure 3), the percentage of students at or above Proficient generally increased for both Reading (students in 11<sup>th</sup> grades) and Mathematics (students in 10<sup>th</sup> grades). In 2005, with the implementation of the Payne School Model, there was a slight decrease in Reading and an increase in Mathematics. In 2006 with the continued implementation of the Payne School Model, the percentage of students from poverty in the 11<sup>th</sup> grades who were at or above Proficient increased dramatically—by more than 28 points—and the percentage of students from poverty in the 10<sup>th</sup> grades who were at or above Proficient increased significantly—by more than 12 points.

Officials in the school district (Petz, 2007, personal communication) believe that the use of the Payne School Model contributed very significantly to the growth in these areas.

### ***Discussion/Recommendations***

The analysis of covariance results demonstrates the significant impact of the High Model Fidelity (HMF) implementation of the Payne School Model in both Mathematics and Reading for Grade 6. The other results are mixed. The examination of multiple groups of students at secondary grades suggested increases in the percentages of students from poverty at or above the Proficient levels over time with the implementation of the Payne School Model. Significant limitations of the elementary analyses included the small number of teachers reaching the 40% criterion on model implementation, as well as availability of data from prior years to conduct the analysis of covariance. Recommendations for 2006–07 include increasing the number of teachers meeting or exceeding a criterion of 50% of model implementation and analyzing data for Grades 3, 4, 5, 6, 7, and 8, consistent with the Kansas Assessment Schedule, maximizing the use of the analysis of covariance.

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**Table 1**

Summary of Results for ANCOVA for **Mathematics—2005–06**  
Hutchinson School District (Kansas): **High Model Fidelity (HMF) in Payne School** vs. Other in Payne School  
Dependent Variable: Mathematics Score in 2006; Covariate: Mathematics Score in 2005

Grade	Group	Sample Size	ANCOVA – Adjusted Means	Direction of Difference	F	Probability	Disaggregates				
							G	Race	LEP	Pov	Dis
5 <sup>th</sup>	HMF	22	73.963	HMF < Other	.483	.487	ns	ns	ns	NA	NA
	Other	236	75.724								
6 <sup>th</sup>	HMF	22	80.416	HMF > Other	16.319	.000***	ns	ns	ns	ns	ns
	Other	247	70.364								

**Table 2**

Summary of Results for ANOVA for **Mathematics—2005–06**  
Hutchinson School District (Kansas): **High Model Fidelity (HMF) in Payne School** vs. Other in Payne School  
Dependent Variable: Mathematics Score in 2006

Grade	Group	Sample Size	Means	Direction of Difference	F	Probability
3 <sup>rd</sup>	HMF	38	77.76	HMF < Other	2.863	.091*
	Other	327	87.42			
4 <sup>th</sup>	HMF	177	78.07	HMF < Other	1.241	.266
	Other	153	84.28			

\* p<.10; \*\* p<.05; \*\*\* p<.01

**Table 3**

Summary of Results for ANCOVA for **Reading—2005–06**  
Hutchinson School District (Kansas): **High Model Fidelity (HMF) in Payne School** vs. Other in Payne School  
Dependent Variables: Reading/English/Language Arts in 2006; Covariate: Reading/English/Language Arts in 2004

Grade	Group	Sample Size	ANCOVA – Adjusted Means	Direction of Difference	F	Probability	Disaggregates				
							G	Race	LEP	Pov	Dis
6 <sup>th</sup>	HMF (1) Other	22 258	81.130 74.675	HMF > Other	7.154	.008***	ns	ns	NA	ns	ns

**Table 4**

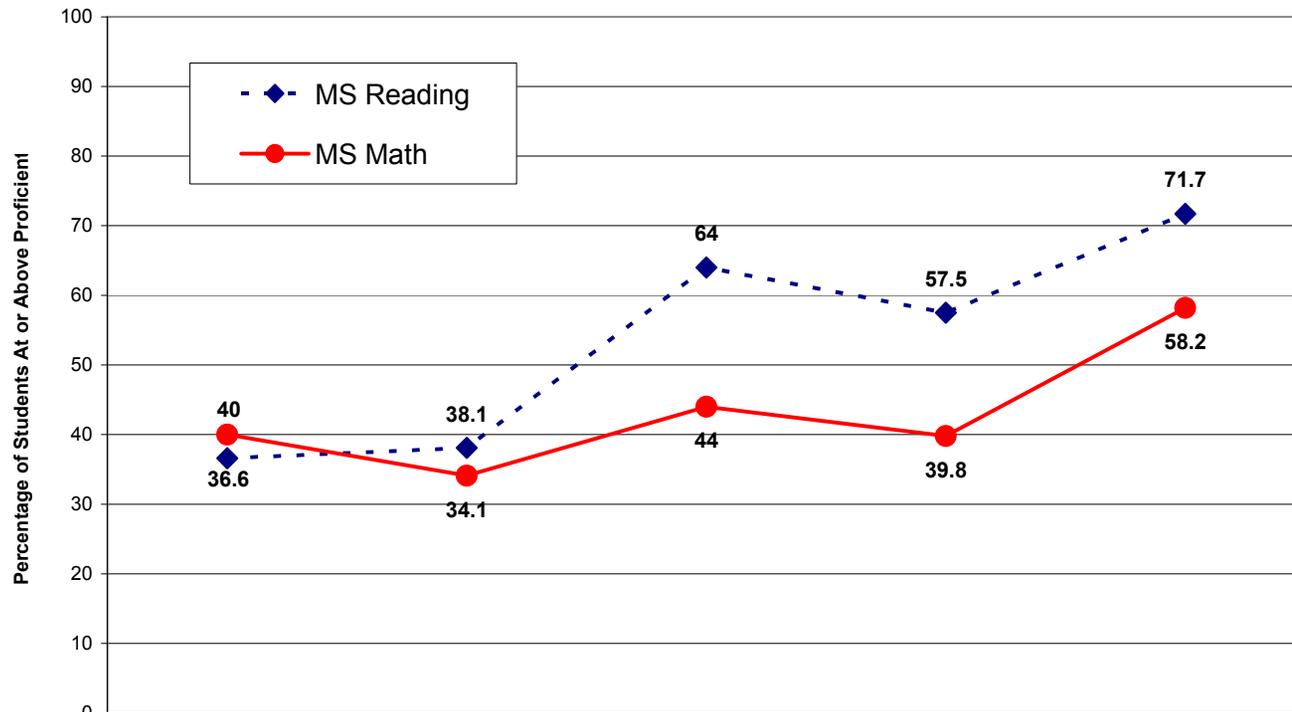
Summary of Results for ANOVA for **Reading—2005–06**  
Hutchinson School District (Kansas): **High Model Fidelity (HMF) in Payne School** vs. Other in Payne School  
Dependent Variable: Reading Score in 2006

Grade	Group	Sample Size	Means	Direction of Difference	F	Probability
3 <sup>rd</sup>	HMF Other	38 326	73.79 79.49	HMF < Other	.091	.341
4 <sup>th</sup>	HMF Other	177 155	77.54 84.95	HMF < Other	2.186	.140
5 <sup>th</sup>	HMF Other	25 273	97.20 79.20	HMF > Other	5.152	.024**

\* p<.10; \*\* p<.05; \*\*\* p<.01

Figure 1

**USD 308 Hutchinson Middle School  
State Math and Reading 2002 to 2006  
Poverty Students  
Percent Proficient and Above**



	2002	2003	2004	2005	2006
- ◆ - MS Reading	36.6	38.1	64	57.5	71.7
- ● - MS Math	40	34.1	44	39.8	58.2

\* Reading data from 2002-05 include eighth-grade scores only.  
 \* Math data from 2002-05 include seventh-grade scores only.  
 \* 2006 data in Reading and Mathematics include both seventh- and eighth-grade scores.

Figure 2

**Hutchinson High School  
Algebraic Skills Assessment  
Grade 10  
02-03 to 05-06**

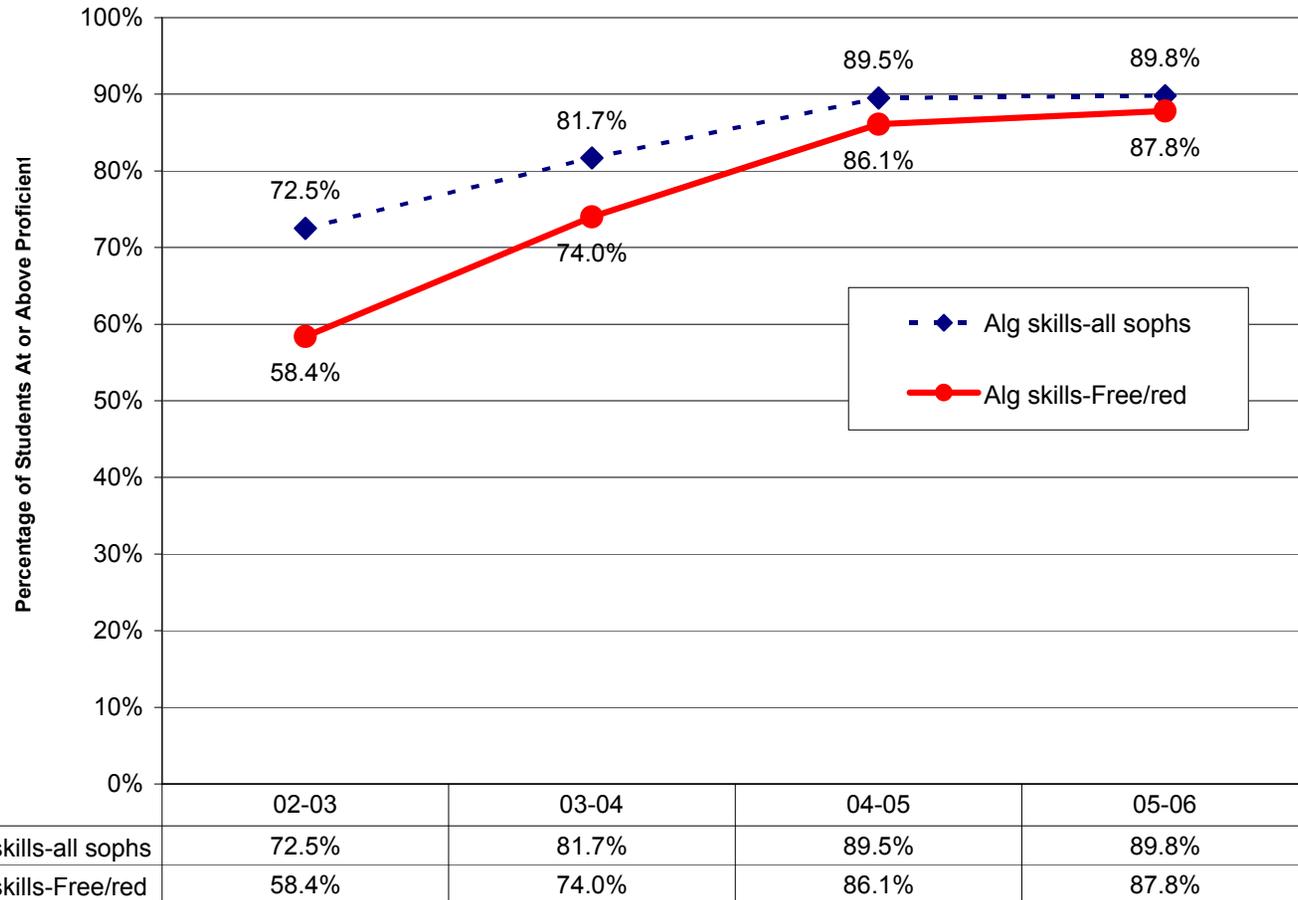
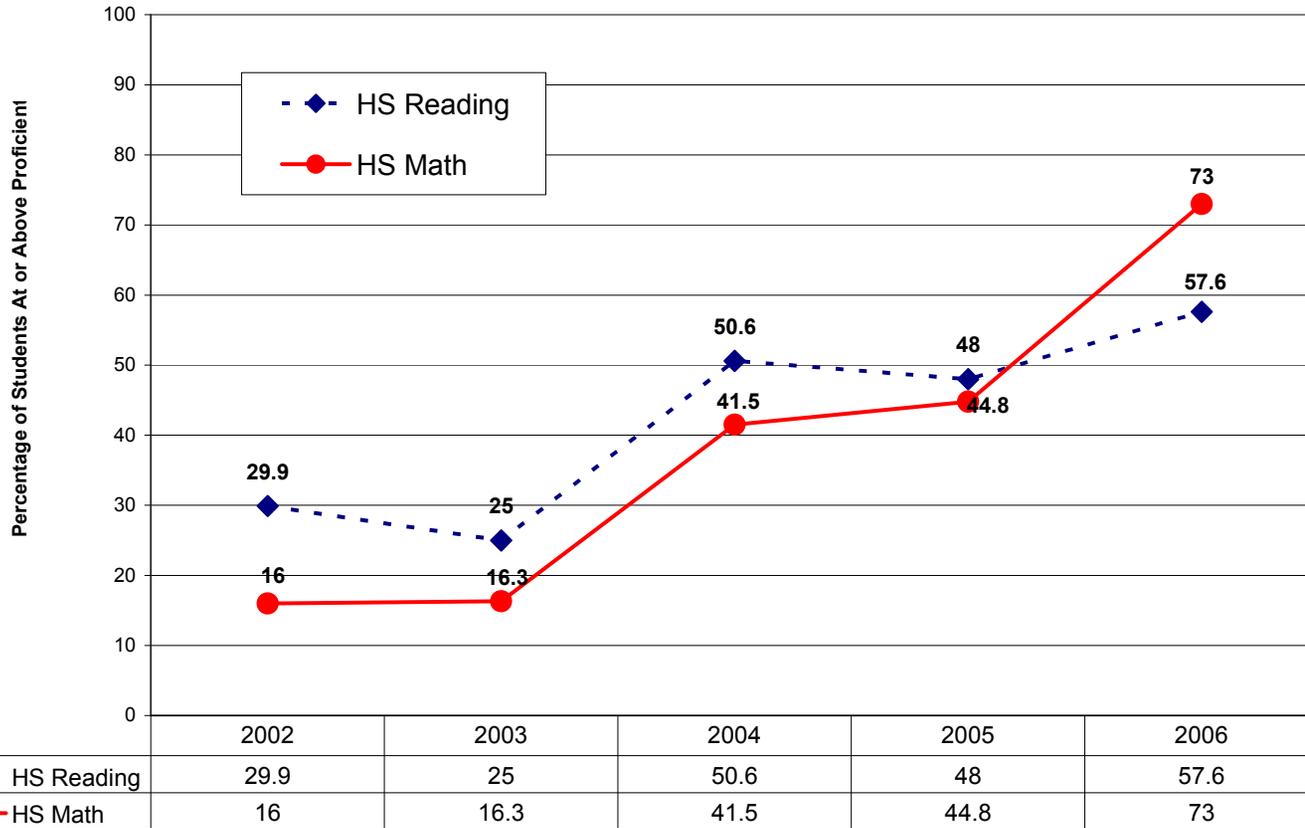


Figure 3

**USD 308 Hutchinson High School  
State Math and Reading 2002 to 2006  
Poverty Students  
Percent Proficient and Above**



\* Reading data include 11<sup>th</sup>-grade scores only.

\* Math data include 10<sup>th</sup>-grade scores only.