



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

**Windsor Middle School  
Windsor, New York**

**First-Year Report:  
2004-05 Data**

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

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Windsor Middle School  
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**Abstract**

*The Ruby Payne Model was implemented in Windsor Middle School, located in Windsor, New York, in 2004-05. The dependent variables were the Eighth-Grade English/Language Arts Scaled Scores and the Eighth-Grade Mathematics Scaled Scores—standardized tests used by the New York Department of Education for assessing student performance in literacy and mathematics, respectively, in 2004-05. The covariates were the related New York standardized tests in the same areas when these students were fourth-graders in 2000-01. Using the analysis of covariance, the adjusted mean differences were not statistically significant at the  $p < .05$  level. However, the students in the classes with teachers with higher levels of implementation in both English/language arts and mathematics had higher adjusted mean scale scores than those students in classes with teachers with lower levels of implementation.*

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## ***Introduction and Purpose***

The federal No Child Left Behind Act (2001) and corresponding state legislation throughout the country require that schools use “research based” programs to increase student achievement in all academic areas, with particular emphasis on reading/English/ language arts and mathematics. Consistent with these mandated foci on student achievement, Dr. Ruby K. Payne initiated research to determine the impact of the implementation of her model (which is based on *A Framework for Understanding Poverty, Learning Structures and Meeting Standards & Raising Test Scores* materials and training) on student achievement in the areas of reading/English/language arts and mathematics. Currently, 19 schools in five school systems (one in each of five states) have committed to receiving technical assistance for model implementation *and* have agreed to share standardized test data required to determine the impact of the model on student achievement.

## ***Methodology***

The research design to determine impact had two dimensions. The first dimension was establishing model fidelity at each school. The second dimension was determining the statistical significance of the impact of the Payne Model on student achievement in reading/English/language arts and mathematics. The design for this analysis was a post-test-only comparison design for two groups, using the analysis of covariance to adjust for initial differences between two teachers in each of two curricular areas (English/language arts and mathematics). One teacher in each pair was rated at a lower level of implementation, and one was rated at a higher level of implementation.

### ***Model Fidelity***

Two aha! Process, Inc. instruments (*Instructional Framework—Observation Scale* and *Instructional Framework—Artifacts/Conference Scale*) were used to assess the fidelity of the implementation of the Payne Model. The first instrument comprised 47 indicators that were criterion-referenced to key model components/activities; the second comprised 34 indicators that also were criterion-referenced to key model components/activities. Both instruments were used by aha! Process consultants to determine the fidelity of the implementation of the model. The median inter-rater reliability for the first instrument was .83, with a range from .72 to .95; for the second, the median inter-rater reliability was .92, with a range from .82 to .97. The final required level of model fidelity was implementation of 80% of the model components over two years. This was the first year of model implementation, and the expectation for model implementation was a rating on the model fidelity index of between .40 and .50.

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

A post-test-only comparison design for two groups (experimental group—a teacher implementing the Payne Model at a high level of implementation for the first year; comparison group—a teacher implementing the Payne Model at a lower level of implementation for the first year), using the analysis of covariance to adjust for initial

differences between two groups, was used to determine the statistical impact of the implementation of the model on student achievement. The independent variable was the higher level of implementation or lower level of implementation of the model. The dependent variables were eighth-grade standardized test scores on statewide tests in New York in both English/language arts and mathematics. The covariates were fourth-grade standardized test scores on statewide tests in New York in English/language arts and mathematics. The level of statistical significance was set at  $p < .05$ . In order for a student to be included in a group, the student must have participated in the implementation of the model for a minimum of six months and have all data on all variables.

### ***Context for Windsor Middle School***

Windsor Middle School, located in Windsor, New York, serves sixth- to eighth-grade students. All staff persons have received *A Framework for Understanding Poverty*, *Learning Structures*, and *Meeting Standards & Raising Test Scores* trainings from aha! Process, Inc. consultants. During the course of the 2004–05 school year, technical assistance was provided by aha! Process, Inc. consultants.

#### *English/Language Arts*

An aha! Process, Inc. consultant provided four technical-assistance sessions to English/language arts teachers, with each teacher receiving the equivalent of 2.5 days of technical assistance. During the first semester, the focus of technical assistance was upon:

- Input strategies and the “why” behind the five instructional strategies.
- The need for a consistent plan-and-label process for non-fiction and a consistent mental model for formal register.
- Time-and-content grids.
- Teachers’ use of the strategies they had tried in their classrooms.
- Aligning the curriculum with the standards.
- Establishing a plan to help prepare students for the listening-and-response section of the state assessment.

The Payne Lesson Design also was introduced during the first semester. The second semester’s technical assistance focused on:

- Continued use of strategies in the classroom.
- Identifying targeted students.
- Completing a resource analysis on identified students.
- Developing interventions based on the resource analysis.
- Identifying weak standards from state assessment to target.
- Time-and-content grids.
- Developing consistent mental models and reading strategies across grade levels.

## *Mathematics*

An aha! Process, Inc. consultant provided four technical-assistance sessions to math teachers, with each teacher receiving the equivalent of 3.5 days of technical assistance. During the first semester, technical assistance focused upon:

- The “What, Why, and How” of learning and mental models.
- Step sheets and sorting.
- Time-and-content grids.
- Target standards and students.
- Resource analysis for targeted students.
- Vocabulary activities.
- Common bell work/warmup activities.

The Payne Lesson Design also was introduced during the first semester. The second semester’s technical assistance focused on:

- Developing a common plan-and-label process for math.
- Improving step sheets and mental models.
- Developing time-and-content grids for the first grading period of the following school year.
- Planning for the 2005–06 school year, specifically use of bell work and ten-question tests.

## *Science*

aha! Process, Inc. consultants provided four technical-assistance sessions to science teachers. Each teacher received the equivalent of 2.5 days of technical assistance. During the first semester, technical assistance focused upon:

- The “What, Why, and How” of learning and mental models.
- Step sheets and sorting.
- Time-and-content grids that had already been prepared.
- Identified target standards and targeted students.
- Resource analysis for targeted students.
- Vocabulary activities.
- Common bell work/warmup activities.

The Payne Lesson Design also was introduced during the first semester. The second semester’s technical assistance focused on:

- A resource analysis for the three weakest students.
- Student interventions.
- Time-and-content grids for the first grading period of the following school year.
- Implementing the common plan-and-label process that was being used in math.

### *Social Studies*

An aha! Process, Inc. consultant provided three technical-assistance sessions to social studies teachers, with each teacher receiving the equivalent of two days of technical assistance. During the first semester technical assistance focused upon:

- A review of concepts from previous trainings.
- The need for a consistent plan-and-label process for non-fiction and open-response questions.
- Targeted students and resource analysis of these students.
- The Payne Lesson Design.

In the second semester, social studies technical assistance focused on:

- Interventions for targeted students based on a resource analysis.
- The need for a common lesson design to optimize learning time.
- Further use of the Payne Lesson Design.

### *Non-Core*

An aha! Process, Inc. consultant provided one session of technical assistance to all non-core teachers. The non-core teachers were divided into two groups, with each group receiving one-half day of technical assistance. The technical assistance session focused upon:

- Means to reinforce the input strategies in the classroom.
- Mental models.
- Plan-and-label process for non-fiction text.

### *Other Factors Impacting the School*

Several factors impacted the school during 2004–05. First, there was additional informal external technical assistance provided by an external consultant in mathematics using a different model; this factor provided an alternative rival hypothesis for multi-treatment interaction in terms of the impact of the Payne Model. Second, no comparison school was identified; the research design was altered to compare teachers with lower vs. higher levels of implementation in this school. Third, only student achievement in English/language arts and mathematics were studied. And fourth, the sample sizes for demographic data on students (gender, race/ethnicity, poverty/non-poverty, limited English proficiency, and disabilities) were below 40, which precluded investigation of these groups in both sets of analyses.

### *Dependent Variables and Covariates*

The dependent variables were the Eighth-Grade Mathematics Scaled Scores and the Eighth-Grade ELA Assessment—the two standardized tests used by the New York Department of Education for assessing student performance in literacy and mathematics, respectively, in 2004–05. The covariates were the related New York standardized tests in the same areas when these students were fourth-graders in 2000–01.

## **Results**

The results are presented in two sections: model fidelity and student achievement.

### *Model Fidelity*

For English/language arts, the teacher with the lower level of implementation was rated as .17 on the Model Fidelity Index (Group 1, ELA); the teacher with the higher level of implementation was rated as .47 on the Model Fidelity Index (Group 2, ELA). For mathematics, the teacher with the higher level of implementation received a rating of .68 on the Model Fidelity Index (Group 1, Math); the teacher with the lower level of implementation was rated as .51 on the Model Fidelity Index (Group 2, Math).

### *Student Achievement*

Tables 1 and 2 contain overview summaries of the results for English/language arts and mathematics. Only one analysis of student achievement data was conducted for both dependent variables: Total Group. A narrative explanation of the results is provided below for each analysis.

**English/language arts** – A total of 82 students were served by the teacher at the lower level of implementation (Group 1, ELA), and a total of 29 students were served by the teacher at the higher level of implementation (Group 2, ELA). The analysis of covariance for the differences between the two groups of students (see Table 1) on the Eighth-Grade English/Language Arts scores (as adjusted for the Fourth-Grade English/Language Arts score—the covariate) yielded an F statistic of 2.51, which was not statistically significant at the  $p < .05$  level. However, the means for the Eighth-Grade English/Language Arts scores adjusted for the covariate indicated that the mean for the students served in Group 2, ELA (higher implementation rating) was higher than the mean for the students served in Group 1, ELA (lower implementation rating): 717.21 vs. 710.34.

**Mathematics** – A total of 84 students were served by the teacher at the non-implementation level (Group 1, Math), and a total of 29 students were served by the teacher at the higher level of implementation (Group 2, ELA). The analysis of covariance for the differences between the two groups of students (see Table 2) on the Eighth-Grade Mathematics scores (as adjusted for the Fourth-Grade Mathematics score—the covariate) yielded an F statistic of 1.224, which was not statistically significant at the  $p < .05$  level. However, the means for the Eighth-Grade Mathematics scores adjusted for the covariate indicated that the mean for the students served in Group 1, Math (higher implementation rating) was higher than the mean for the students served in Group 2, Math (lower implementation rating): 743.47 vs. 740.19.

## **Conclusions/Recommendations**

Since the statistical results indicated no statistically significant differences between the two groups at the  $p < .05$  level, significant conclusions cannot be drawn because of the myriad

factors concerning multiple treatment interaction, limitations in the data sets, limitations in numbers of teachers implementing the model, and the lack of a comparison school. However, the differences in the adjusted means in both cases were higher for the teachers with higher implementation levels of the Payne Model than those with lower implementation levels. Recommendations include limiting the introduction of other innovative practices for a three-year period while introducing the Payne Model, providing complete data sets with demographic variables over more than one teacher in each group, and providing a comparison school.

## References

Payne, Ruby K. (2005). *A Framework for Understanding Poverty* (Fourth Revised Edition). Highlands, TX: aha! Process, Inc.

Research design package (analyses, reliability information for instruments). (2005). Highlands, TX: aha! Process, Inc. Retrieved from [http://www.ahaprocess.com/School\\_Programs/Research\\_&\\_Development/](http://www.ahaprocess.com/School_Programs/Research_&_Development/).

## Appendix

Table 1  
Results of Analysis of Covariance for English/Language Arts

Source	Sum of Squares	df	Mean Square	F Statistic	Significance
ELA4 (Covariate)	19,823.78	1	19,823.78	52.955	.000
Group	940.48	1	940.48	2.512	.116
Error	40,429.98	108	374.35		
Corrected Total	65,216.97	110			

Adjusted Means: Group 1 (Higher Implementation Rating): 717.21  
Group 2 (Lower Implementation Rating): 710.34

Table 2  
Results of Analysis of Covariance for Mathematics

Source	Sum of Squares	df	Mean Square	F Statistic	Significance
Math 4 (Covariate)	27,179.84	1	27,179.84	153.49	.000
Group	216.67	1	216.67	1.22	.271
Error	19,478.71	110	177.08		
Corrected Total	47,526.39	112			

Adjusted Means: Group 1 (Higher Implementation Rating): 743.47  
Group 2 (Lower Implementation Rating): 740.19