

NORTH CAROLINA LEA CASE STUDY

MIDDLE GRADE CONFIGURATION AND STUDENT GROWTH

By Casey Wyant and Kayla Mathis

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INTRODUCTION

Student achievement in middle school years is often highlighted as an area of concern in education policy. Many claim that student performance decreases during these formative years. In efforts to address this perceived problem, many point to the success of districts that have moved away from the middle school model and to the K-8 school model. The purpose of this study is to examine the variance in student performance in the 6th grade and determine if this variance is influenced by the grade configuration of the school.

BACKGROUND

Over the last century there have been a number of changes in middle grade configuration. In early 20th century, the most dominant organization was the K-8 elementary school followed by a 9-12 high school (Paglin and Fager 1997). By 1960 the junior high model was the most popular with four out of five high school graduates attending a K-6 elementary school, followed by a 7-9 junior high school, and a 10-12 senior high school. In the 1960s the decline of junior high schools occurred in conjunction with the rise of 6-8 middle schools (Ibid). By the 1970s the dominant organization for schools included a K-5 elementary school, a 6-8 middle school, and a 9-12 high school. By the end of the 20th century many school districts began to re-evaluate grade configuration as a way to address low student performance and high dropout rates associated with transitioning between schools.

Among school districts that are making changes in their grade configurations, the most common change is to return to the K-8 and 9-12 model and eliminate the transition to middle school. Chicago Public Schools have always had a dominant K-8 configuration, while many other systems that switched to 6-8 middle schools are now giving the K-8 schools another try. School districts cite many reasons for switching back to K-8 configurations including efforts to increase student performance, parental dissatisfaction with the traditional middle school, desire for small schools and class sizes, problems with attendance and discipline, and a desire to reduce high dropout rates.

School districts moving back to the K-8 model include Baltimore, Cincinnati, Cleveland, Milwaukee, Oklahoma City, and certain schools in Boston and Denver. Many of these districts are still in the transition process, but those who have completed the process have found that 6th graders in K-8 schools have better attendance and higher test scores than those in 6-8 schools, additionally there has been a reduction in discipline problems.

While some school districts are successfully transitioning back to K-8 schools, others have seen success with middle schools and are continuing to develop ways to make their middle schools more successful. A recent study, addressed in an article in *Education Week*, found that there was no evidence that K-8 schools offered more benefits to students than 6-8 schools, specifically looking at schools in





Philadelphia. The study found that “all things being equal, 8th graders in that city’s [Philadelphia’s] K-8 schools had no higher grade point averages and no fewer Fs or absences than their peers in middle schools.” (Viadero 2006) Self-esteem and safety were considered higher among students in K-8 schools, but the overall conclusion seems to be that the form or configuration of the school alone will not change student achievement.

In North Carolina the dominant grade configuration for middle grades is 6-8 middle schools. The junior high model has been almost completely replaced by the more traditional 6-8 middle school, but other middle grade configurations in the state include 5-8, K-8, 6-9, and 7-12.

CURRENT NUMBER OF SCHOOLS IN EACH GRADE CONFIGURATION IN NORTH CAROLINA (TOTAL 589)

GRADE CONFIGURATION	NUMBER OF SCHOOLS (%)
K-6	51 (8.66%)
K-8	83 (14.10%)
5-8	28 (4.75%)
6-8	387 (65.70%)
6-9	3 (0.51%)
7-9	8 (1.36%)
7-12	5 (0.85%)
Other	24 (4.07%)

North Carolina is a member of the *Making Middle Grades Work* initiative sponsored by the Southern Regional Education Board to further develop middle schools across the southeast and implement the techniques necessary to encourage students and increase achievement. In addition, the 2004 report from the Middle Grades Task Force in North Carolina focused on five specific areas for improving middle schools: Curriculum and Instruction, Diversity, Educator Preparation, Organization and Culture, and Partnerships. The Task Force provided recommendations for making middle schools better, not only by increasing student achievement, but also by enhancing the quality of teaching and leadership of the schools and increasing parent and community involvement to provide the proper environment for adolescent education.

DATA

We used accountability and school summary data for 6th grade students in North Carolina for the 2005-2006 school year. Students who attended charter schools and alternative schools were excluded from the datasets because these types of schools often have alternative structures and programs that cannot adequately be controlled for in a statistical model. After excluding charter and alternative school students and accounting for students who were missing observations for one or more of the variables studied, we had 74,643 observations for math and 75,003 observations for reading.

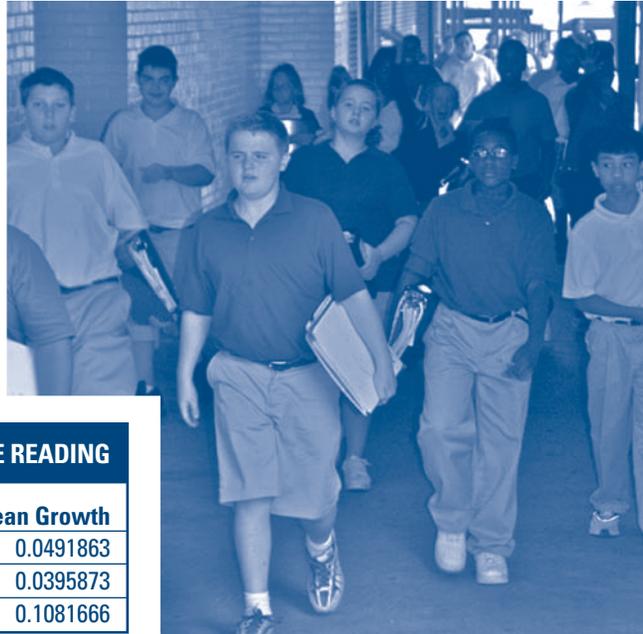
METHODOLOGY

We began by examining average student growth between 5th and 6th grades in mathematics and reading for the 2005-2006 school year.* We then examined the differences in the average student growth based on the grade configuration of the schools. For the purposes of this analysis, we grouped schools into two types. Type A schools were schools where the lowest grade in the school was 6th grade (mostly 6-8 schools). Type B schools were schools that contained both grades 5 and 6 (like K-6 and K-8 schools). We then created a linear model to explain the variance in student growth. For more details on the model used, please see Appendix A.

* *Growth Definition: Student growth is a measurement of the expected average performance for a student based on their test performance history. Growth is measured on a scale of -4 to 4 and is calculated by taking the difference between the student’s normalized score (standardized score for use in comparison) from the current year and the normalized score from the previous year (adjusted to the same scale). 0.00 means that the child met the expectation for average growth for one year. A positive growth number indicates that a child exceeded expectations while a negative growth number indicates that a child did not meet expectations.*

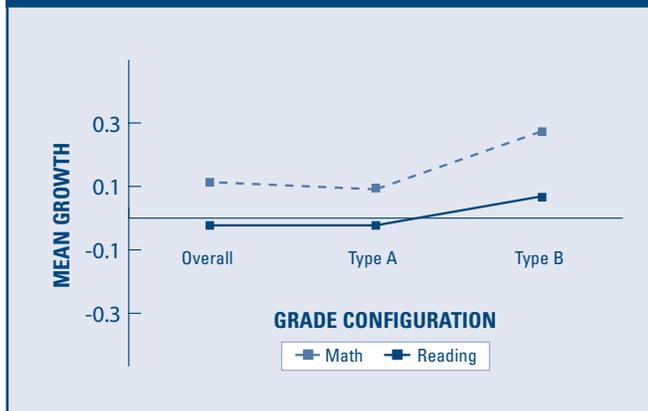
FINDINGS

In the 2005-2006 school year, average student growth between 5th and 6th grade in mathematics was negative, indicating a drop in student performance. Average student growth between 5th and 6th grade in reading was positive but very small. When we looked at the difference in growth for the two types of schools, we found that average student growth in math in Type A schools was slightly negative, while average student growth in math in Type B schools was slightly positive. While average student growth in reading for both types of schools was positive, average student growth was slightly higher in Type B schools. Please see the table and chart below for growth figures.



	6TH GRADE MATH	6TH GRADE READING
Grade Configuration Type	Mean Growth	Mean Growth
Overall	-0.0154402	0.0491863
Type A	-0.0213558	0.0395873
Type B	0.0216680	0.1081666

FIGURE 1 MEAN GROWTH FOR READING AND MATH



We found that the independent variables in our model were not highly correlated with our dependent variable growth. Unfortunately, this model leaves a great deal of the variation in student growth unexplained. However, what the model does explain is statistically significant.

- Attendance at a Type A school had a small negative effect on growth in reading and math
- Non-completion of high school by a student's parent(s) had a small negative effect on growth in reading and math
- The percentage of teachers with 0-3 years of experience had a small negative effect on growth in reading and math
- School leadership had a small positive effect on growth in reading and math
- The percentage of students in poverty had a small negative effect on growth in reading and math

Please see Appendix B for regression coefficients.

CONCLUSION

Though we were unable to fully explain the variance in student growth with our model, we were able to determine some of the variables that have an effect on student growth. While changing the grade configuration may not be the solution, our findings indicate that the variance should be further examined to determine the best way to address the differences. Better student preparation for the transition, along with better teacher preparation and classroom instruction, could address some of the effects and improve student growth. This study could be continued by looking at the trend over several years and exploring other quantifiable variables that might have an effect on growth. There are also transition issues associated with the move into high school that could be addressed using a similar model and comparing students moving from 8th to 9th grade. Transitions and changes are often difficult during the adolescent years, but knowing even a small number of variables that could affect student performance and growth during the transitions will help to determine the next steps that can be taken to make North Carolina middle schools more effective.



While we recognize that many variables effect student growth, especially at the time of middle school transition, many of those variables were either unquantifiable or unavailable at the time of the analysis. The model used for the regression analysis for both math and reading is: $g = \alpha + \beta_1c + \beta_2e + \beta_3t + \beta_4l + \beta_5p + \beta_6a + \epsilon$

In the above model, the dependent variable 'g' is the measure of student growth in math or reading from the 2005-2006 school year. The table below explains each of the independent variables.



APPENDIX A LINEAR MODEL

Independent Variable	Name	Description
c	Grade Configuration	Type A schools are coded as 1; Type B schools are coded as 0.
e	Parental education	Students who report that their parents did not graduate from high school are coded as 1; all other students are coded as 0.
t	Percentage of teachers with 0-3 years of experience	The percentage of teachers in the school with 3 or less years of experience
l	Leadership	Composite leadership score for the school as reported in the North Carolina Teacher Working Conditions Survey
p	Percentage of students in Poverty	The percentage of students in the school who are in poverty.
a	Prior academic achievement	Students' individual c-scores from the 4th grade EOGs (Math scores are used in the math regression; reading scores are used in the reading regression.)

APPENDIX B REGRESSION COEFFICIENTS

Variable	Coefficient	Significance level	Coefficient	Significance level
Grade Configuration	-0.06943	<0.0001	-0.06819	<0.0001
Parent did not graduate from high school	-0.07330	<0.0001	-0.07710	<0.0001
Percentage of Teachers with 0-3 years of experience	-0.14672	<0.0001	-0.14196	<0.0001
School Leadership	0.03168	<0.0001	0.02019	<0.0001
Percentage of students in poverty	-0.38891	<0.0001	-0.19294	<0.0001
4th grade c-score	-0.04000	<0.0001	-0.09080	<0.0001

WORKS CITED

Paglin, Catherine and Jennifer Fager. *Grade Configuration: Who Goes Where?* Northwest Regional Education Laboratory. July 1997.
Viadero, Debra. *K-8 Structure Gives No Academic Boost, Analysis Finds.* Education Week 25 (25), p.5. March 2006.



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The Financial and Business Services Area established the Research Intern Program in FY 2006-07. The Program is designed to help build a quality research program within DPI to supplement and supply data for discussions related to procedural, process, and policy changes. The inaugural program includes five graduate students from four area universities. The intern program is managed by Jackson Miller (919) 807-3731 | intern_research@dpi.state.nc.us.

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