

The Distribution of Educational Resources in Wayne County Public Schools

February 2011



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

Carolina Institute
for Public Policy

The Distribution of Educational Resources in Wayne County Public Schools

By

Kevin C. Bastian, UNC—Chapel Hill

Gary T. Henry, UNC—Chapel Hill

Charles L. Thompson, East Carolina University

Table of Contents

Introduction	1
Data and Methods	1
Descriptive Data on Wayne County High Schools	2
The Distribution of Teacher Quality	8
Conclusion	10
References	11

Tables:

Table 1: Student/School Demographics for the 2008-2009 School Year	3
Table 2: Student Academic Performance for the 2008-2009 School Year	3
Table 3: School Expenditures Per-Pupil for the 2008-2009 School Year	4
Table 4: School Expenditures Per-Pupil for the 2008-2009 School Year Continued	4
Table 5: School Expenditures Per-Pupil for the 2008-2009 School Year Continued	4
Table 6: Funding Sources for Wayne County High Schools for the 2008-2009 School Year	5
Table 7: Teacher Characteristics for the 2008-2009 School Year (All Teachers)	6
Table 8: Teacher Characteristics for the 2008-2009 School Year (All Teachers)	7
Table 9: Teacher Characteristics for the 2008-2009 School Year (EOC Tested Subjects)	7
Table 10: Teacher Characteristics for the 2008-2009 School Year (EOC Tested Subjects)	8
Table 11: Odds Ratio of Goldsboro High School Students Experiencing Quality Teachers (All high school subjects)	9

The Distribution of Educational Resources in Wayne County Public Schools

Introduction

On December 1, 2009, the North Carolina division of the National Association for the Advancement of Colored People (NAACP) issued a formal complaint against Wayne County Public Schools (WCPS), alleging re-segregation of schools and discriminatory practices harming the education of African-American students.

The basis for the complaint was as follows: Wayne County contains thirty-six schools divided into six separate attendance districts. The smallest district, operating only six schools for 2,100 students, is situated within Goldsboro, the county seat. Despite a nearly fifty-fifty African-American and white population split within Goldsboro, this central attendance zone is currently over ninety-nine percent black, with ninety-four percent of the students receiving free and reduced-price lunches. In light of this concentration of African-American students within the central attendance district, the plaintiff alleges practices by municipal, state, and federal agencies are leading to re-segregation, and argues, as a result, that great disparities exist between schools within the central attendance zone and the remaining schools in Wayne County.

Recognizing that this is an issue of great importance to the state and for the provision of an equitable education to all students, the Carolina Institute for Public Policy (CIPP) prepared this report. Its purpose is not to take a position on the merits of the complaint, but solely, to examine the high schools within Wayne County, especially the central attendance zone's Goldsboro High School, and to provide two types of information that may aid in the resolution of the key issues in the complaint:

- 1) descriptive data concerning students, teachers, expenditures, and other characteristics of the county's high schools
- 2) statistical analyses designed to ascertain whether students in different Wayne County high schools get relatively equal access to one of the most important resources in education: high-quality teachers.

Data and Methods

The North Carolina Department of Public Instruction (NCDPI) provided the data that were used to construct the descriptive tables and statistical analysis in this report. This encompassed four main data types: 1) Student test score files with student End of Grade and End of Course achievement information and demographic/socioeconomic indicators; 2) Classroom roster files detailing the teacher and student population for each classroom; 3) Teacher files, including certified salary, licensure, National Board Certification, education, and testing; and 4) School expenditure files documenting funding sources and dollars spent per-pupil.

Together, this information allowed CIPP to match students to their classroom teachers and schools, link students and teachers to their fixed and time-varying characteristics, and detail expenditures at the school level. This matching process was the key to this report, as it facilitated

accurate descriptive and analytical work concerning student performance, school demographics and spending, and teacher characteristics.

The descriptive tables in this report (Tables 1-10) present school level averages for 2008-2009, the most recent year for which all of the necessary data were available, and cover the eight schools with high school grades (9-12) in Wayne County: Goldsboro High School, Charles B. Aycock High School, Eastern Wayne High School, Rosewood High School, Southern Wayne High School, Spring Creek High School, Wayne Early-Middle College High School, and the Wayne School of Engineering. For the statistical analysis (Table 11) concerning a student's likelihood of experiencing teachers with specific characteristics, CIPP used five years of data, beginning in 2004-2005 and ending in 2008-2009. Thus, while the descriptive tables provide a recent snapshot of the academic performance, spending, and teacher characteristics in Wayne County's high schools, the statistical analysis identifies longer-term trends in the distribution of high-quality teachers.

To perform this statistical analysis CIPP employed a logistic maximum likelihood estimation method. Essentially, this procedure calculates the odds of experiencing a given outcome, in this case a student being taught by a teacher with specific characteristics (National Board Certification, in-field teaching, holding a supplemental Master's degree, alternative entry teaching, and first-year teaching) in comparison with a reference group. For this report students at Goldsboro High School were the group of interest, and their odds of experiencing teachers with the above traits were compared with the odds of students experiencing these same teacher characteristics at the seven other high schools in Wayne County. Therefore, this method captured whether Goldsboro High School students faced differential exposure to certain teacher characteristics associated with student achievement than their peers in Wayne County.

Descriptive Data on Wayne County High Schools

In this section we provide descriptive information on Wayne County high schools, based on data from 2008-2009, the most recent year for which we have complete and reliable data. We also have and would be willing to provide data from earlier years, beginning in 2004-2005. The tables on the following pages present school level averages or percentages on key variables for the eight schools in Wayne County containing grades (9-12). The school of interest, Goldsboro High School, is listed first, followed by a weighted average of Wayne County's high schools, excluding Goldsboro, and then the remaining high schools are listed separately.

- 1) Charles B. Aycock High School (9-12)
- 2) Eastern Wayne High School (9-12)
- 3) Goldsboro High School (9-12)
- 4) Rosewood High School (9-12)
- 5) Southern Wayne High School (9-12)
- 6) Spring Creek High School (6-12)
- 7) Wayne Early-Middle College High (9-12)
- 8) Wayne School of Engineering (9-10)

Table 1: Student/School Demographics for the 2008-2009 School Year

School Name	School Size	Percent Black	Percent Eligible for Free or Reduced Price Lunch	Graduation Rate	Suspensions Per 100 Students
Goldsboro	559	96.00%	87.30%	44.8%	135.60
Weighted average excluding Goldsboro	733	32.32%	47.60%	80.22%	32.86
Charles Aycock	1,191	23.72%	34.80%	82.7%	31.23
Eastern Wayne	1,132	44.98%	38.70%	91.1%	23.05
Rosewood	500	16.98%	40.00%	80.7%	17.60
Southern Wayne	1,047	46.34%	65.50%	70.9%	50.81
Spring Creek	931	19.67%	59.70%	71.4%	43.50
Wayne Early-Middle College	168	19.77%	35.70%	95%	5.36
Wayne School of Engineering	160	50.36%	54.40%	N/A	11.25

*Note: Statistics for Spring Creek High School include middle school grades (6-8).

Table 1 presents student and school-level demographics for Wayne County schools that contain high school grades (9-12). Of particular note are the data for Goldsboro High School in the final four columns. These show that Goldsboro High has many more black students, students eligible for federally subsidized lunches, and suspensions per 100 students than the other Wayne County schools with high school grades. Additionally, the four-year cohort graduation rate for Goldsboro High School (44.8%), indicates that of each 100 students starting 9th grade at Goldsboro High School, roughly forty-five graduated in four years. This rate is much lower than those for other schools in the district, which are all approximately at or above the state average of 71.7%

Table 2: Student Academic Performance for the 2008-2009 School Year

School Name	8 th Grade Math	8 th Grade Reading	Percent of Students Taking EOC Tests	Average EOC Scale Score and Statewide Rank		EOC Performance Composite
Goldsboro	-0.400	-0.456	69.59%	147.92	452/564	52.60%
Weighted average excluding Goldsboro	0.148	0.057	85.84%	152.23	236/564	71.75%
Charles Aycock	0.147	0.112	87.91%	152.99	188/564	74.90%
Eastern Wayne	0.215	0.128	84.10%	153.69	129/564	77.60%
Rosewood	0.065	0.096	84.40%	153.15	173/564	78.00%
Southern Wayne	-0.128	-0.204	82.52%	148.45	439/564	55.80%
Spring Creek	0.245	0.012	N/A	151.53	296/564	69.10%
Wayne Early-Middle College	0.793	0.668	94.64%	160.40	3/564	100%
Wayne School of Engineering	0.496	0.392	99.38%	153.57	131/564	77.20%

*Note: For the percentage of students taking EOC tests, Spring Creek High School is non-applicable due to the presence of middle grades (6-8).

Table 2 provides average school level data on student academic achievement in Wayne County high schools. The 8th grade mathematics and reading scores capture the skill levels of students as they enter high school. For this report, these scores are presented so that the average score is set to zero, below average scores are negative and above average scores are positive. The 8th grade reading and mathematics scores of students entering Goldsboro High School are well below the state average and below any other high school in Wayne County. The percentage of students taking EOC tests is defined as the number of students taking an EOC examination in a year divided by the total student population at the school. The average End of Course (EOC) Scale Score and the statewide rank (out of 564 North Carolina public schools with high school grades) index the overall academic performance of each school, and finally, the EOC Performance

Composite measures the percentage of tests passed (at or above the cutoff score for proficiency) divided by the total number of tests taken by students in the school. This table shows that students at Goldsboro High School enter high school with lower End of Grade test scores, take End of Course examinations at a lower rate, earn lower End of Course test scores, and pass their End of Course examinations at a lower rate than at other high schools in Wayne County.

Table 3: School Expenditures Per-Pupil for the 2008-2009 School Year

School Name	Total Per-Pupil Expenditures	Regular Instruction	Special Instruction	Professional Development	Supplemental Instruction
Goldsboro	\$10,954.84	\$6,514.16	\$960.06	\$116.90	\$10.25
Weighted average excluding Goldsboro	\$7,878.09	\$4,626.58	\$550.82	\$82.38	\$10.25
Charles Aycock	\$7,108.67	\$4,123.79	\$467.31	\$79.13	\$10.25
Eastern Wayne	\$8,043.51	\$5,038.20	\$477.56	\$80.52	\$10.25
Rosewood	\$8,630.21	\$4,772.58	\$901.15	\$81.37	\$10.25
Southern Wayne	\$8,171.88	\$4,778.71	\$711.38	\$83.90	\$10.25
Spring Creek	\$7,734.02	\$4,302.82	\$548.28	\$81.05	\$10.25
Wayne Early-Middle College	\$9,240.89	\$5,694.33	\$74.61	\$100.62	\$10.25
Wayne School of Engineering	\$7,565.51	\$4,761.17	\$67.24	\$101.55	\$10.25

Table 3 starts with the total per-pupil expenditures at each of the high schools in Wayne County, and then begins to show expenditures broken out into categories created by CIPP. Regular instruction includes teachers' salaries, benefits, supplements, performance bonuses, and classroom materials for teachers of all regular education students. Special instruction mirrors the regular instruction spending category, but for special education students. Professional development expenditures are tied to staff development and new teacher orientation, while supplemental instruction concerns salaries, benefits, and materials for instruction outside the school day and year. This table shows that in comparison to other high schools, Goldsboro High School spends more per-student overall (\$10,954.84), and across regular instruction, special instruction, and professional development. The regular instruction column is particularly important, and indicates that Goldsboro High School is spending considerably more on its teachers than other Wayne County high schools.

Table 4: School Expenditures Per-Pupil for the 2008-2009 School Year

School Name	Student Services	Instructional Support	Extracurricular Activities	Transportation	School Maintenance
Goldsboro	\$511.66	\$348.80	\$129.50	\$167.20	\$664.97
Weighted average excluding Goldsboro	\$356.86	\$320.47	\$96.87	\$289.60	\$517.12
Charles Aycock	\$309.17	\$300.33	\$96.90	\$284.76	\$504.24
Eastern Wayne	\$352.73	\$235.60	\$96.48	\$260.89	\$528.55
Rosewood	\$383.21	\$339.69	\$167.91	\$273.74	\$556.43
Southern Wayne	\$346.70	\$230.10	\$77.88	\$358.27	\$523.97
Spring Creek	\$378.96	\$425.37	\$111.51	\$289.06	\$527.95
Wayne Early-Middle College	\$525.40	\$1,113.31	\$9.46	\$165.72	\$412.17
Wayne School of Engineering	\$418.35	\$150.73	\$9.46	\$263.17	\$412.17

Table 4 continues displaying the total per-pupil expenditures broken down by categories. Student services include salaries, benefits, and materials for guidance and health staff and media services.

Instructional support contains spending on media services, technological support for teachers, and salaries and benefits for technology support personnel. Extracurricular activities include all expenditures for school-sponsored activities where participation is not required. Transportation includes salaries and other expenditures related to the daily transportation of students, and school maintenance contains spending for utility charges and all activities related to school cleaning and repair. There are no major findings here, although Goldsboro High School continues to be one of the highest spenders in most categories, except transportation.

Table 5: School Expenditures Per-Pupil for the 2008-2009 School Year

School Name	Food Service	School Leadership	Community Services	Capital Outlay
Goldsboro	\$501.08	\$738.62	\$0.00	\$22.77
Weighted average excluding Goldsboro	\$310.33	\$425.07	\$6.80	\$121.02
Charles Aycock	\$281.81	\$359.35	\$0.00	\$219.74
Eastern Wayne	\$312.63	\$358.46	\$8.83	\$37.05
Rosewood	\$356.19	\$496.05	\$0.00	\$334.66
Southern Wayne	\$333.32	\$425.75	\$23.75	\$35.56
Spring Creek	\$393.28	\$373.28	\$0.00	\$64.56
Wayne Early-Middle College	\$13.87	\$829.52	\$0.00	\$0.00
Wayne School of Engineering	\$41.13	\$1,038.66	\$0.00	\$335.32

Table 5 presents the final breakdowns of total per-pupil expenditures into categories. Food service includes spending for materials, food supplies, nutrition activities and salaries related to food service. School leadership contains expenditures for salaries, benefits, and supplies related to school administration. The community services category includes spending on recreation or civic programs and salaries related to them, and capital outlay is spending for the acquisition of property and buses, renovations, and replacement of furnishings. Of note here, Goldsboro High School spends considerably more, per-pupil, on school leadership and food service than all other high schools, except the non-traditional Wayne Early-Middle College and Wayne School of Engineering.

Table 6: Funding Sources for Wayne County High Schools for the 2008-2009 School Year

School Name	Percentage of School Funding from State Sources	Percentage of School Funding from Local Sources	Percentage of School Funding from Federal Sources
Goldsboro	78.28%	11.29%	4.71%
Weighted average excluding Goldsboro	81.23%	8.65%	2.95%
Charles Aycock	78.66%	9.59%	2.71%
Eastern Wayne	82.87%	8.51%	2.88%
Rosewood	74.27%	8.29%	7.65%
Southern Wayne	83.31%	7.32%	3.26%
Spring Creek	80.90%	9.95%	1.49%
Wayne Early-Middle College	94.81%	5.03%	0.01%
Wayne School of Engineering	85.38%	8.62%	---

*Note: The local, state, and federal categories comprise a large majority of funding sources, but other small funding sources exist. Therefore, not all rows will sum to 100%.

Table 3 indicates that more money is spent, per-pupil, at Goldsboro High School than the other high schools in the district. To discern whether this greater spending is a result of disproportionate

state, local, or federal funding, Table 6 presents percentages of school funding by source. This table shows that all high schools in Wayne County receive a large majority of their funding from the state of North Carolina, with Goldsboro High School actually lagging the district weighted average. However, Goldsboro High School receives greater percentages of funding, from local and federal sources than many of the other high schools in the district. Of particular note here, is the local funding percentage, which indicates that Wayne County Public Schools disproportionately compensate Goldsboro High School at a higher level than other high schools in the district.

Table 7: Teacher Characteristics for the 2008-2009 School Year (All Teachers)

School Name	Teachers at the School	Average Salary	Average Years of Experience	Pupil Teacher Ratio	Standardized Teacher Test Scores
Goldsboro	61	\$40,338	11.96	9.16 to 1	-0.330
Weighted average excluding Goldsboro	70	\$41,857	13.61	13.95 to 1	-0.017
Charles Aycock	84	\$41,438	12.47	14.18 to 1	-0.017
Eastern Wayne	81	\$43,118	15.88	13.97 to 1	-0.076
Rosewood	39	\$41,808	13.00	12.82 to 1	0.151
Southern Wayne	81	\$42,482	15.43	12.92 to 1	-0.089
Spring Creek	66	\$40,958	11.69	14.10 to 1	-0.041
Wayne Early-Middle College	11	\$44,055	15.72	15.27 to 1	0.173
Wayne School of Engineering	8	\$34,987	4.87	20 to 1	0.245

Both Table 7 and Table 8 detail basic descriptive information on all teachers in Wayne County's high schools. For this analysis, an individual needed to be paid as a teacher for at least six pay periods during the 2009 fiscal year to be included. Also of note in tables 7 and 8 is that information for Spring Creek High School includes any teacher in sixth through twelfth grade that meets the minimum six pay period criteria. The standardized teacher test scores come from the Praxis II licensure tests and other post-training teacher examinations, such as the GRE. Finally, the pupil teacher ratio is defined as the number of students at the school divided by the number of teachers. Table 7 shows that outside of the Wayne School of Engineering, teachers at Goldsboro High School have one of the lowest averages for years of experience, and hence, one of the lowest average salaries. As seen in Table 3, however, Goldsboro High School spends considerably more on each pupil, especially in regular instruction. The paradox of low average salaries but high per-pupil expenditures is explained by the low ratio of pupils to teachers at Goldsboro High School. Finally, the standardized teacher test scores represent an approximation of a teacher's pedagogical and content knowledge in their subject of licensure, or their overall mathematical and analytical abilities, as measured by post-training examinations. A standardized score of zero means a teacher displayed the average level of performance across all the teachers in the state. Here, the data show that teachers in Goldsboro High School earned the lowest test scores in the district, a third of a standard deviation below the state average.

Table 8: Teacher Characteristics for the 2008-2009 School Year (All Teachers)

School Name	NBC Teachers Counts & %		Supplemental Masters Teachers Counts & %		First Year Teachers Counts and %		Alternative Entry Teachers Counts & %		Out of State Teachers Counts & %	
	Count	%	Count	%	Count	%	Count	%	Count	%
Goldsboro	2	3.28%	11	18.03%	2	3.28%	22	36.07%	8	13.11%
Weighted average excluding Goldsboro	10.56	16.04%	13.48	18.48%	2.85	4.51%	16.97	24.91%	5.66	8.03%
Charles Aycock	10	11.90%	14	16.67%	4	4.76%	16	19.05%	6	7.14%
Eastern Wayne	12	14.81%	20	24.69%	1	1.23%	16	19.75%	7	8.64%
Rosewood	7	17.95%	7	17.95%	1	2.56%	9	23.08%	3	7.69%
Southern Wayne	9	11.11%	15	18.52%	4	4.94%	21	25.93%	8	9.88%
Spring Creek	16	24.24%	11	16.67%	4	6.06%	24	36.36%	4	6.06%
Wayne Early-Middle College	4	36.36%	2	18.18%	0	0.00%	4	36.36%	2	18.18%
Wayne School of Engineering	1	12.50%	0	0.00%	2	25.00%	2	25.00%	0	0.00%

Table 8 presents counts and percentages for several teacher characteristics — National Board Certification, first year teachers, alternative entry, out of state, and supplemental masters degree — associated with significant effects on student achievement. Here, Goldsboro High School has a particularly small Nationally Board Certified teacher population and a large alternative entry teacher population. Additionally, the out of state teacher population is also moderately elevated in comparison to other high schools in Wayne County.

Table 9: Teacher Characteristics for the 2008-2009 School Year (EOC Tested Subjects)

School Name	Teachers at the School	Average Salary	Average Years of Experience	Average Class Size	Standardized Teacher Test Scores	In-field Class Counts & %	
						Count	%
Goldsboro	26	\$40,528	11.82	12.3	-0.322	35	35.00%
Weighted average excluding Goldsboro	25	\$41,541	13.21	17.20	0.022	83	69.88%
Charles Aycock	29	\$40,482	12.82	20.43	0.041	88	69.29%
Eastern Wayne	31	\$41,832	14.53	16.26	0.103	119	75.80%
Rosewood	14	\$44,752	15.54	15.75	0.061	57	82.61%
Southern Wayne	29	\$40,868	13.24	17.02	-0.025	96	67.13%
Spring Creek	18	\$42,713	12.00	15.81	-0.014	56	62.92%
Wayne Early-Middle College	9	\$43,076	15.50	12.76	0.103	30	73.17%
Wayne School of Engineering	5	\$33,264	4.00	18.27	-0.389	11	47.83%

Unlike Tables 7 and 8, Tables 9 and 10 display teacher characteristics for teachers in high school tested subjects only. These include: English I, algebra I, algebra II, geometry, physical science, physics, biology, chemistry, civics, and US history. When examining these values it is important to compare them to those in Table 7 and Table 8, to discern whether any of the high schools place their more experienced or higher-quality teachers disproportionately in tested subjects. Examining Table 9 for Goldsboro High School this does not appear to be the case. The average salary, years of experience and teacher test scores are comparable to those reported in Table 7, and lower than other Wayne County high schools (excluding the Wayne School of Engineering). The average class size is comparable to the overall pupil teacher ratio—meaning Goldsboro High School invests more in smaller classes in tested subjects. Finally, the in-field column displays unique class counts and overall percentages of classes taught by teachers holding initial or continuing licenses in the specific subject taught. This shows that Goldsboro High School has far fewer courses taught by in-field teachers than other schools in Wayne County.

Table 10: Teacher Characteristics for the 2008-2009 School Year (EOC Tested Subjects)

School Name	NBC Teachers Counts & %		Supplemental Masters Teachers Counts & %		First Year Teachers Counts & %		Alternative Entry Teachers Counts & %		Out of State Teachers Counts & %	
	Count	%	Count	%	Count	%	Count	%	Count	%
Goldsboro	1	4.00%	6	24.00%	1	4.00%	8	32.00%	4	16.00%
Weighted average excluding Goldsboro	3.79	17.21%	4.19	18.62%	1.08	5.32%	4.35	20.23%	2.36	9.69%
Charles Aycock	3	10.34%	5	17.24%	1	3.57%	2	6.90%	3	10.34%
Eastern Wayne	5	16.13%	4	12.90%	0	0.00%	6	19.35%	2	6.45%
Rosewood	2	16.67%	4	33.33%	0	0.00%	2	16.67%	2	16.67%
Southern Wayne	3	10.34%	4	13.79%	3	10.34%	4	13.79%	4	13.79%
Spring Creek	6	35.29%	5	29.41%	1	6.25%	8	47.06%	1	5.88%
Wayne Early-Middle College	3	33.33%	1	11.11%	0	0.00%	2	22.22%	1	11.11%
Wayne School of Engineering	0	0.00%	0	0.00%	2	40.00%	1	20.00%	0	0.00%

Analogous to Table 8, Table 10 displays counts and percentages for several teacher characteristics (EOC tested subjects) — National Board Certification, supplemental masters degrees, first year teachers, alternative entry, and out of state teachers — that are significantly associated with student achievement. Here, Goldsboro High School has comparatively low percentages of National Board Certification, and comparatively high percentages of alternative entry and out of state teachers. For Tables 8 and 10, however, an analysis over multiple years of data better captures the distribution of teacher quality. That statistical analysis is presented in the next section.

The Distribution of Teacher Quality

Teacher quality is the most important school-level factor determining student performance. As Judge Howard Manning, Jr. has ruled in the *Leandro* school finance case, states and school districts have a responsibility to ensure that every classroom is staffed by an effective instructor who promotes high student achievement. Research indicates, however, that teachers sort themselves across and within school districts, preferring to teach in schools with fewer academically and economically disadvantaged students. This can adversely affect minority and high-poverty students.

Therefore, we sought to determine whether students at Goldsboro High School in End of Course (EOC) tested subjects had significantly different chances of experiencing quality teachers than students at the seven other high schools in Wayne County. For this report we defined teacher quality with several indicators, each of which have been correlated with significant effects (positive or negative) in previous research. The indicators are as follows:

- 1) National Board Certification: A variable indicating that the teacher currently held National Board Certification status.
- 2) In-field: A variable indicating that a teacher was teaching a course in which they held an initial or continuing license.
- 3) Supplemental Master’s Degree: A variable indicating that a teacher earned a Master’s degree after entering the teaching profession.

- 4) Alternative Entry: A variable indicating that a teacher’s original pathway into the teaching profession was through an alternative entry program.
- 5) First Year Teacher: A variable indicating that a teacher was in their first year of teaching.

Using data from the 2004-2005 to 2008-2009 school years on Wayne County high schools, we applied a statistical technique (logistic regression analysis) that enabled us to determine whether students at Goldsboro High School had different odds of exposure to teachers with these characteristics than did students at other high schools in the district. For this analysis, a coefficient of “1” indicates the probability of having a teacher with the characteristic being examined is the same in Goldsboro and the other Wayne County Schools; above “1” means the probability is greater in Goldsboro High School; and below “1” indicates a lower probability in Goldsboro High School as compared to others in Wayne County. Significant odds ratio coefficients in Table 10 signify that Goldsboro High School students in tested subjects have differential probabilities of experiencing teachers with the above characteristics.

Table 11: Odds Ratio of Goldsboro High School Students Experiencing Quality Teachers (All high school subjects)

School Name	National Board Certification	In-Field	Supplemental Master’s Degree	Alternative Entry	First Year Teacher
Goldsboro	0.463*	0.312*	0.415*	2.669*	2.236*

*Note: These logistic regression teacher quality models incorporate data from 2004-2005 through 2008-2009. All coefficients are reported as odds ratios, with statistically significant coefficients in bold with an asterisk.

As we see in Table 11, students at Goldsboro High School are much less likely to have teachers with National Board Certification, individuals teaching in the field in which they hold an initial or continuing license to teach, or teachers with supplemental Master’s degrees than are students at other Wayne County high schools. The effect sizes for National Board Certification, in-field teachers, and supplemental Master’s degree holders all indicate that the odds of experiencing these types of teachers are less than half as good at Goldsboro High School than at the other Wayne County high schools. Furthermore, Goldsboro High School students are substantially more likely to get alternative entry teachers and teachers in their first year of teaching. Here, the odds of students at Goldsboro High School experiencing an alternative entry teacher are more than 2 ½ times greater than those of students at other Wayne County high schools, and the odds of getting a first year teacher are almost as high.

In earlier research on the effects of teacher characteristics on student learning in North Carolina schools, we found that Nationally Board Certified teachers, teachers teaching in-field, and teachers with supplemental Master’s degrees produce significantly higher student learning outcomes than do teachers without these characteristics in EOC tested subjects. Additionally, past research also established that first year teachers and high school teachers who entered teaching via an alternative entry pathway tend to produce substantially lower student learning outcomes. Therefore, this prior work, in conjunction with the current logistic analysis, indicates that students at Goldsboro High School do not enjoy an opportunity to experience high-quality teachers and achievement outcomes as equal to the opportunity that other high school students in the district receive.

Conclusion

While this report focused on the resources and student outcomes of the secondary schools in Wayne County, specifically Goldsboro High School, differences in student achievement for the student bodies of these schools existed well before entry into ninth grade (see Table 2). The purpose of this report, then, is not meant to assess the causes of poor student performance in Goldsboro High School, but rather, to provide facts about the distribution of performance and resources throughout Wayne County from an independent and objective source. Relative to other high schools in the district, the results illustrate that despite compensatory funding, Goldsboro High School is unable to attract a teacher workforce that is comparable in quality to the other high schools in the district. In all likelihood, this disparity is principally due to the way that the teacher labor market operates – teachers, as shown by prior research, often prefer to work in low-poverty, low-minority, and high-achieving schools. Currently, Goldsboro High School allocates the extra funding to lower class sizes, but without demonstrably improving student achievement or graduation rates.

Despite these outcomes readers should not interpret the findings as an argument against spending more in certain schools in order to address inequities. Rather, the results indicate that the particular policy choices made in this case do not provide access to the resources necessary to raise student performance for students at Goldsboro High School to the level achieved in other high schools in Wayne County. First, as stated above, teacher preferences for low-poverty, low-minority, and high-achieving schools make it difficult for Goldsboro High School to attract high-quality teachers. Furthermore, restrictions on compensatory funding, specifically the single salary structure for teachers and uniform teacher supplements within school districts, mean that Goldsboro High School cannot compensate for their student composition with greater pay in order to recruit and retain high quality teachers. As a result of these policy constraints, the additional funding provided to Goldsboro High School has provided a less effective remedy — smaller class sizes. Money can matter for student performance, but using it to provide the most effective resources is essential.

References

- Aaronson, Daniel, Lisa Barrow, William Sander. 2007. Teachers and student achievement in the Chicago Public High Schools. *Journal of Labor Economics* 25(1): 95-135.
- Boyd, Donald, Hamilton Lankford, Susanna Loeb, Matthew Ronfeldt, and James Wyckoff. 2011. The role of teacher quality in retention and hiring: Using applications to transfer to uncover preferences of teachers and schools. *Journal of Policy Analysis and Management* 30(1): 88-110.
- Clotfelter, Charles, Helen Ladd, and Jacob Vigdor. 2005. Who teaches whom? Race and the distribution of novice teachers. *Economics of Education Review* 24(4): 377-392.
- Hanushek, Eric, John Kain, and Steven Rivkin. 2004. Why public schools lose teachers. *The Journal of Human Resources* 39(2): 326-354.
- Henry, Gary, C. Kevin Fortner, and Charles Thompson. 2010. Targeted funding for educationally disadvantaged students: A regression discontinuity estimate of the impact on high school student achievement. *Educational Evaluation and Policy Analysis* 32(2): 183-204.
- Henry, Gary, Charles Thompson, Kevin Bastian, C. Kevin Fortner, David Kershaw, Kelly Purtell, and Rebecca Zulli. 2010. Portal Report: Teacher Preparation and Student Test Scores in North Carolina. Available at:
[http://publicpolicy.unc.edu/files/Teacher Portals Teacher Preparation and Student Test Scores in North Carolina 2.pdf](http://publicpolicy.unc.edu/files/Teacher_Portal_Teacher_Preparation_and_Student_Test_Scores_in_North_Carolina_2.pdf)
- Koedel, Cory and Julian Betts. 2007. Re-examining the role of teacher quality in the educational production function. *National Center on Performance Incentives, Working Paper 2007-3*.
- Lankford, Hamilton, Susanna Loeb, and James Wyckoff. 2002. Teacher sorting and the plight of urban schools: A descriptive analysis. *Educational Evaluation and Policy Analysis* 24(1): 37-62.
- Nye, Barbara, Spyros Konstantopoulos, and Larry Hedges. 2004. How large are teacher effects? *Educational Evaluation and Policy Analysis* 26(3): 237-257.
- Rockoff, Jonah. 2004. The impact of individual teachers on student achievement: Evidence from panel data. *The American Economic Review* 94(2): 247-252.

Carolina Institute for Public Policy



UNC
COLLEGE OF
ARTS & SCIENCES