

**CHARACTERISTICS OF NORTH CAROLINA HIGH SCHOOLS
WITH AND WITHOUT SENIOR PROJECT**

**Report from
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to

SERVE

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¹ Qin Xiaowen of SERVE contributed significantly to this project. She built the database and made helpful comments on the analysis. L. Lopez is responsible for the results and content of the report.

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CHARACTERISTICS OF NORTH CAROLINA HIGH SCHOOLS WITH AND WITHOUT SENIOR PROJECT

Summary

This work compared North Carolina high schools that implemented Senior Project (SP) with schools that did not (NSP). Demographic and performance characteristics were examined. Information about the types of schools using the program can help SERVE in disseminating Senior Project.

SERVE had done an earlier survey of North Carolina high schools. It provided information on which schools had Senior Project, were considering it, or did not have it. The SP and NSP schools from that study were included here. School-level data were from the National Center for Educational Statistics and the North Carolina Department of Public Instruction. There were 87 SP and 132 NSP schools with sufficient data for the model. SPSS was used to randomly select 87 of the 132 NSP schools so the two groups were the same size.

Logistic regression was used to examine the likelihood of being a Senior Project or a Non-Senior Project school. The proposed variables were free or reduced-price School Lunch (needy), twelfth grade students, twelfth grade students who were African American, locale (city, town/urban fringe, rural), performance composite, met expected growth or not, dropout rate, and SAT. The main model included the variables that were not highly correlated with each other. Those were needy, met expected growth, and locale in town/urban fringe. In the reduced model, only percent needy was significant ($p < .05$). A second exploratory model included all the main effects proposed as well as interactions. Its reduced model ($p < .10$) had needy, town/fringe locale, average dropout rate, total SAT, and interaction of needy with met expected growth and town/fringe with performance composite. When reduced further, the only significant variable was percent needy ($p < .05$), as in the first model.

In this sample, Senior Project schools were generally similar to NSP schools. The only significant difference was in needy students ($p < .05$). Free or reduced-price School Lunch was higher in the SP schools (28%) than in the NSP group (23%). For descriptive purposes, SP and NSP schools were compared with North Carolina high schools. For grade twelve students, there were proportionately more SP and NSP schools in the 'large school' group than in the state overall. However, SP schools were similar to North Carolina schools for percentage of African American students, while (47%) of the NSP schools had low proportions. Senior Project and NSP schools were like the state in locale, for they had similar percentages in urban, town or urban fringe, and rural areas.

A COMPARISON OF NORTH CAROLINA HIGH SCHOOLS WITH AND WITHOUT SENIOR PROJECT

Overview

This work compared the characteristics of North Carolina schools that implemented Senior Project (SP) with those that did not (NSP). It can be considered a market analysis, for it examined the factors related to a school having SP. The program could have been used more by schools of a certain size, performance profile, or locale. SERVE can use the information in expanding Senior Project to new locations. The main issues were 1) whether North Carolina schools that participated in Senior Project differed in their characteristics from schools that did not have the program; and 2) whether schools that used SP had achievement scores that differed from those of NSP schools.

Senior Project has been described as a culminating assessment for twelfth graders that demonstrates what they know and are able to do as they prepare to graduate from high school (SERVE, 2003). Senior Project consists of writing a research paper on an approved topic of the student's choice, developing a product and portfolio, and delivering a presentation to a panel of community members. Senior Project incorporates research, writing, doing a presentation, planning and time management.

SERVE had done an earlier survey of high schools (Egelson et al, 2002). That provided information on which schools had Senior Project, were considering it, or did not have it. For this work, Senior Project schools included those who identified as having SP, regardless of the number of Senior Project components used. In the survey, 11% had fewer than 3 components, but the school-level information was not available from that study. High schools considering Senior Project were not included here, as their status was undergoing change. High schools that did not respond to the survey were also excluded, as their Senior Project status was unknown.

All data for the analyses were available to the public and at the school level. No individual data were used for this work. The study was approved by the Institutional Review Board at UNC-Greensboro.

Methods

The data were from the Common Core of Data (CCD) of the National Center for Educational Statistics (NCES, 2003) and the North Carolina Department of Public Instruction (NC DPI, 2003b). The variables proposed for the model were selected and reviewed for completeness. The CCD provided most of the school-level demographics, and the most recent year available was 2000-01. Performance data were from the North Carolina Department of Public Instruction (NC DPI, 2003a). They included the ABC data of performance composite and whether the schools met the expected growth during 2001-02. Dropout rates and school lunch data were from 2001 (NC DPI, 2003b). School-level SAT data were from 2002 (NC DPI, 2003b). There

were no statewide tests that all seniors took, according to the Department of Public Instruction. Exit exams were taken in various years, as were end-of-course tests.

The data for the study were obtained from the full CCD database and put into an SPSS file. The DPI data were added from EXCEL files. SAT data were entered into the SPSS file. The cases included the SP and NSP schools from the earlier SERVE survey (Egelson et al, 2002).

Variables

The dependent variable was the probability of being a Senior Project or a Non-Senior Project school. The logistic regression model included main effects and two-way interactions.

Independent variables in the proposed model were as follows:

- Free or reduced-price School Lunch (%)
- Twelfth grade students (N)
- African Americans in twelfth grade (%)
- Locale (city, town or urban fringe, rural) (%)
- Performance composite (%)
- Met expected growth (0,1)
- Average dropout rate (%)
- SAT mean

Needy. School lunch data included the percentage eligible for free or reduced-price school lunch. For free school lunch, the income guideline was 130% of poverty, and for reduced price lunch it was 185% (USDA, 2003). It is considered a measure of economic need. School performance is often associated with low income.

Twelfth grade students. For total students, the twelfth grade was used rather than the whole school, since the number of grades within a school varied. Some high schools included grades 7 and 8 in totals if they were part of the same system. Others had grades 10 to 12 only. Using twelfth graders provided a more meaningful comparison across schools.

African-American students. Twelfth grade figures were used to compute the percentage of African Americans. That was an indicator of need, given the low-income rates among African Americans. Hispanics/Latinos were also a high need group, but the percentages were very low in most schools. It is difficult to detect differences between groups with small numbers. The percentage of African American students was entered after school lunch, since the latter was a more direct measure of need.

Locale. This was from the CCD, and was based on Census data. Locale was first examined for North Carolina regular high schools. About half (48%) were classed as rural, 21% were in cities (mostly mid-sized), 16% were in towns (mostly small towns), and 15% were on the fringe of cities. The categories were grouped for analysis as city (large or mid-size), town (small and large) or urban fringe, and rural. For the regression analysis, dummy variables (0,1) were created for city or not, town/fringe or not, and rural or not.

School performance. There were two performance indicators from the ABC Accountability Model (NC DPI, 2003a). The Performance Composite was the percentage of students scoring at

grade level or above in end-of-grade tests. As noted earlier, there were no achievement tests given to all seniors. Subjects from earlier years would be reflected in the Composite.

The other performance variable was Met Expected Growth or not (0,1). There was an ABC growth standard for each school that was based on prior performance and statewide growth. The variable was whether the school met the expected growth or not. School Status was another designation in the ABC report, but it was based on the Performance Composite and Met Expected Growth, which were already included.

Dropout rates and SAT scores may be related to the Performance Composite. However, they generally represent two different groups. Students who take the SAT are planning on going to college. They are unlikely to include many people who dropout. Dropout rates varied over the three years available, so an average was computed for 1998-99 through 2000-01. SAT was the school average (Math and Verbal combined). It is often used for comparing school performance.

Sample

School-level data were obtained for 102 of the 103 Senior Project schools and 171 of the 178 Non-Senior Project schools who responded to the earlier SERVE survey. North Carolina had more than 320 public high schools. Many of the schools were missing data for the model. They were removed from the dataset, since SPSS would have excluded them from the analysis. They were generally alternative schools or career centers, or very small schools for which performance data may have been unreliable. That left 87 Senior Project and 132 Non-Senior Project schools. SPSS was used to randomly select 87 of the 132 NSP schools for the analysis, so the two groups were the same size.

Analysis

Distributions were examined. Performance composite and average dropout rate were normally distributed, and percent needy approximated a normal distribution. Two-way interactions were calculated within SPSS. Main effects and interactions were examined for inter-correlations. Many were correlated with percent needy.

The main model tested had variables not already correlated with each other. That included needy (% free or reduced price School Lunch), met expected growth or not (0,1), and locale in town or urban fringe (0,1). The logistic regression was run with SP or NSP school as the dependent variable. The model calculated the probability of being a Senior Project or a Non-Senior Project school. Variables were removed in reverse order of significance ($p > .20$, $> .10$, and $> .05$).

A second model was run to explore the relationships. It included the main effects and two-way interactions, even if there were inter-correlations. The main effects were needy, twelfth grade students, African Americans in twelfth grade, locale, performance composite, met expected growth, average dropout rate, and SAT. Due to inter-correlations, variables were removed in stages. The interactions were removed if $p > .50$ and then if $> .20$. Main effects were then removed if $p > .30$. Then interactions and main effects were removed if $p > .20$, $> .10$, and $> .05$.

Results

The initial model examined the likelihood of being a Senior Project school that was associated with the variables entered (Table 1). The ‘Odds’ is the Exp (B) from SPSS. It represents the odds that a school would be a Senior Project school for each increase in the independent variable. It is followed by its 95% confidence interval (CI). The likelihood was 95% that the real value fell between those figures. For statistical significance, the usual cutoff is .05, although .10 is often used for exploratory work.

Table 1. Initial Model (#1) for Characteristics of NSP and SP schools

Independent variables	Odds (95% CI)	Significance
Needy (free/reduced price school lunch)	1.025 (1.002, 1.049)	.032
Met expected growth	1.766 (.792, 3.936)	.164
Town or urban fringe locale	1.120 (.586, 2.142)	.731
Constant	.447	.049

After the unimportant variables were removed, the reduced model had ‘needy’ as the only variable that was statistically significant ($p=.033$) (Table 2). The odds of being a Senior Project school increased as the proportion of needy students increased.

Table 2. Final Model for Characteristics of NSP and SP schools

Independent variables	Odds (95% CI)	Significance
Needy (free or reduced price School Lunch)	1.025 (1.002, 1.048)	.033
Constant	.537	.057

There was a second exploratory model. It included all the main effects in the proposed model and interactions with no exclusion for inter-correlations. The reduced model ($p<.10$) had needy, town/fringe locale, average dropout rate, total SAT, and interactions of needy with met expected and town/fringe with performance composite (Table 3). The Odds were rounded to two decimal places for readability.

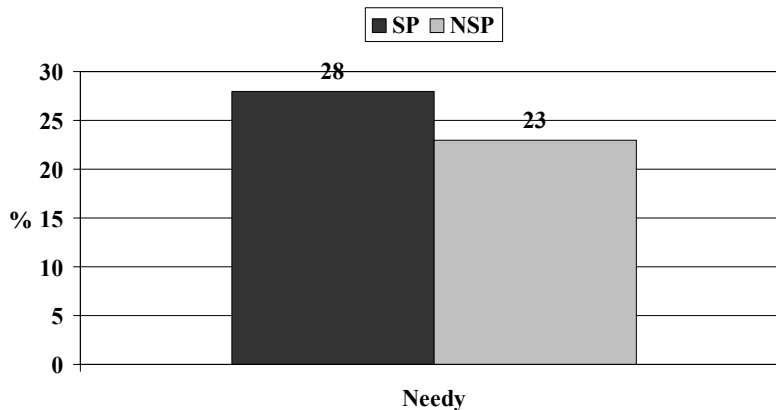
Table 3. Reduced Exploratory Model (#2) for Characteristics of SP and NSP Schools

Independent variables	Odds (95% CI)	Significance
Needy	1.06 (1.01, 1.11)	.013
Town/fringe	.01 (.00, 2.22)	.098
Average dropout rate	1.28 (1.03, 1.58)	.026
Total SAT score	1.01 (1.00, 1.01)	.063
Needy by met expected	.97 (.94, 1.01)	.095
Town/fringe by performance composite	.94 (.88, 1.01)	.088
Constant	.01	.300

Variables were further removed in reverse order of significance. The only significant variable was needy ($p < .05$), which left the same final model noted earlier (Table 2).

Figure 1 shows the percentages of economically needy students. The proportion was higher in the Senior Project group (28%) than in the Non-Senior Project group (23%) ($p < .05$).

Figure 1. Needy % ($p < .05$)



Descriptive results

This section has descriptive data from the variables examined in the model. They were not significantly different. However, the similarities may be of interest to SERVE personnel.

Dropout rates. Senior Project and NSP schools were not significantly different in their average dropout rates. The rates were 6.0% in the SP schools and 5.3% in the NSP schools (Figure 2). The North Carolina (NC) average during the same period was 5.7%.

Performance composite. This is the school average for scoring at or above grade level in end-of-course tests. The mean for the Non-Senior Project schools was 72% (Figure 3). The mean for the Senior Project schools (69%) was the same as that for North Carolina (NC DPI, 2003a). The state average ranged from 49% for students whose parents did not finish high school to 78% for those whose parents had graduate degrees.

Met expected growth. Schools that met this expectation were 86% of the NSP group and 78% of the SP group (Figure 3). In North Carolina, 75% of all public schools met or exceeded expected growth (NC DPI, 2003a). However, that included elementary and middle schools as well as high schools.

Figure 2. Average dropout rates
(1998-99 through 2000-01)

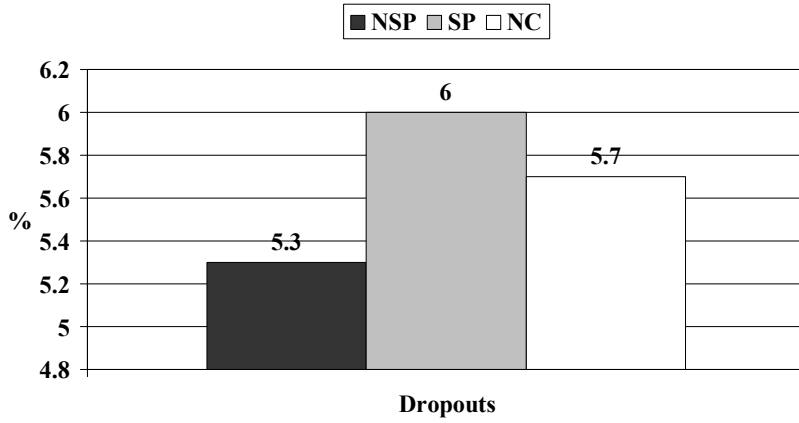
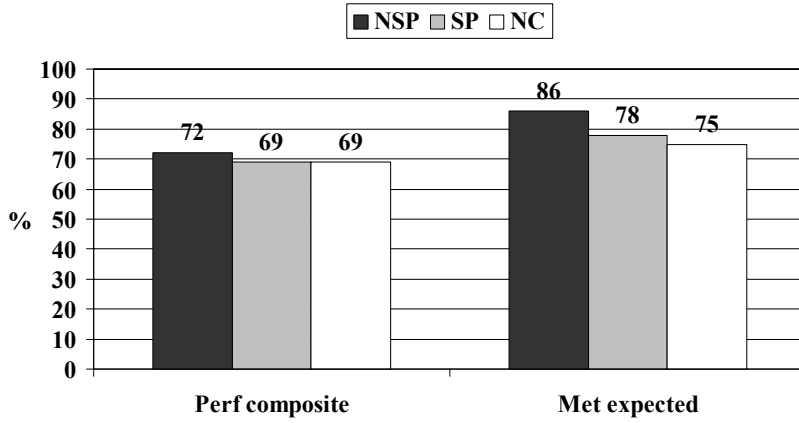
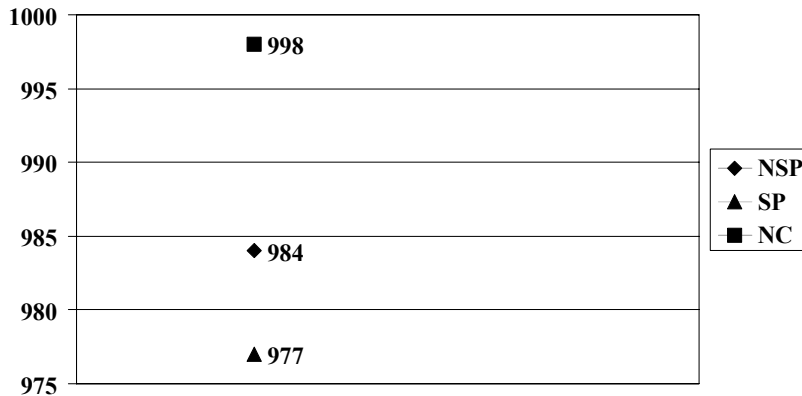


Figure 3. Performance indicators



SAT score. The combined mean for the NSP schools was 984 compared to 977 for the Senior Project schools (Figure 4). The North Carolina average was 998 (NC DPI, 2003b).

Figure 4. SAT scores



Grade 12 Students. The student numbers were similar, with 213 for the NSP and 220 for the SP schools. For descriptive purposes, the groups were compared with regular high schools in North Carolina. The data were from the CCD (NCES, 2003). Schools with fewer than 15 students in grade 12 were excluded. The remaining NC schools were grouped as small (16 to 152 grade 12 students), medium (153 to 228 students), or large (229 or more). The grade 12 students from the NSP and SP schools were recoded into those 3 categories. The large school group had 38% of SP and 39% of NSP schools (Figure 5). The mid-sized group had 33% of SP and 25% of NSP schools. The small school group had 28% of SP versus 36% of NSP. Therefore, the SP schools had proportionately more in the medium group and fewer in the small group than the NSP and the state overall.

African American students in grade 12. The study groups were slightly different, with 21% African Americans in the NSP and 27% in the SP schools. To compare with NC schools, three groups were computed for the percentages of grade 12 students who were African Americans. The North Carolina high schools were grouped as low (up to 13.5%), medium (13.6% to 34.8%), or high (34.9% or more). The SP and NSP schools were categorized by those cutoffs. The SP group was similar to North Carolina (Figure 6). About one-third of Senior Project schools were in each category. However, the NSP group had nearly half (47%) in the lowest third for North Carolina. These NSP schools had more schools with lower percentages of African Americans than the SP schools and the state overall.

Figure 5. School size by grade 12 students

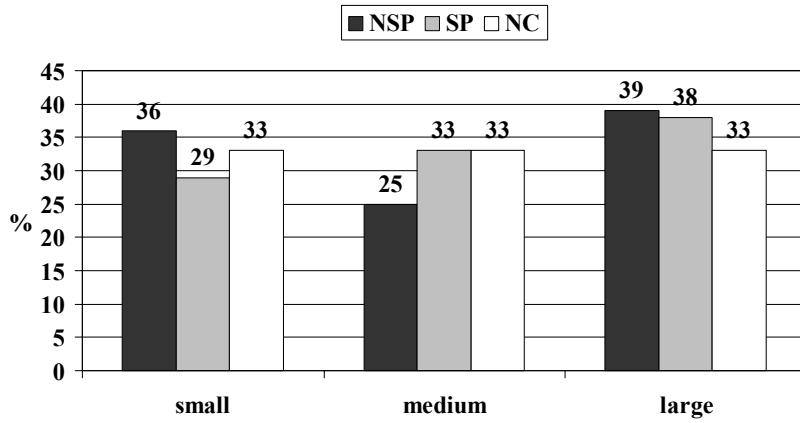
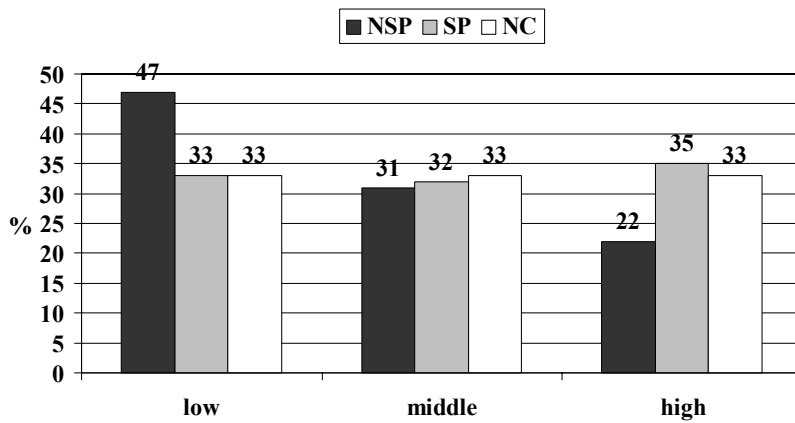
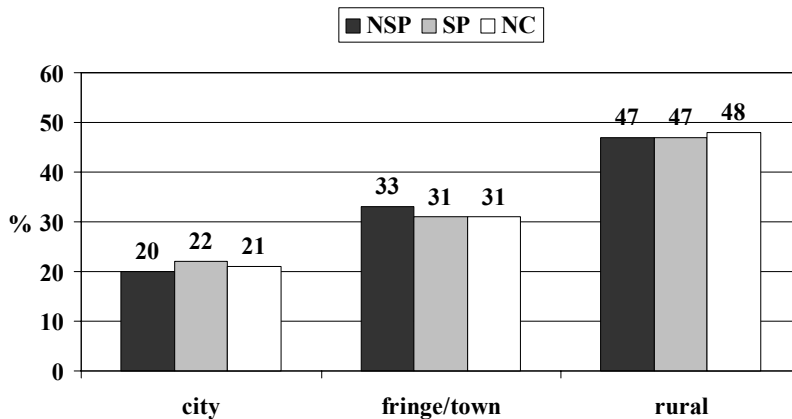


Figure 6. African American students in grade 12 (%)



Locale. This was grouped as city, urban fringe or town (fringe/town), or rural area. It did not differ much across the groups. The percentages for the study schools were compared with North Carolina high schools (NCES, 2003) (Figure 7). Both study groups were very similar to North Carolina. That is, they had similar proportions of schools in the various locales.

Figure 7. Schools by locale (%)



Discussion

This was a comparison of schools that used Senior Project and those that did not. The characteristics examined are generally considered important in educational programs. The Senior Project schools were similar to schools that did not use Senior Project. The only significant difference was in needy students, for schools that chose to use SP had a higher percentage than NSP schools. Economic need is often associated with lower academic performance. Schools that decided to have SP may have wanted to improve student performance. Otherwise, Senior Project seemed to be used across the board. SERVE could use that information in disseminating the program.

Descriptive analysis showed that SP schools were similar in size to NSP schools, but both groups included many large schools compared to North Carolina overall. By locale, Senior Project schools were representative of North Carolina. That is, they had similar percentages in urban areas, towns or urban fringe, and rural locations. In addition, the Senior Project schools had percentages of African American students that were like those of North Carolina high schools. However, more of the NSP group had low proportions of African American students.

This study included about half of the high schools in the state. Some schools did not have a definite status for SP, and many had missing data for the model. There may have been different response rates as well. SP schools may have had more interest in responding to the SERVE survey than NSP schools. In addition, there were more large schools in the sample than in North Carolina overall. The larger schools may have had more resources to respond to the survey, or more small schools may have had uncertain SP status.

This cross-sectional work was considered a market analysis. It did not examine outcomes for Senior Project. There is an effect study for Senior Project in progress at this writing. It will compare students in randomly assigned schools just starting with Senior Project with those not using SP. Baseline and post-program data will be used in analyzing student outcomes. There is a similar study in established SP schools and NSP schools.

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