Preliminary Impacts of North Carolina's Rural Innovative Schools Project

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Background and Context: Funded by an Investing in Innovation (i3) Validation grant, the Rural Innovative Schools (RIS) Project is the first widespread effort to scale up the early college model by implementing it in comprehensive high schools. This paper will present preliminary findings from the evaluation of this project.

Purpose and Goals of the Study: This study is designed to examine the impact of the early college strategies as implemented in the Rural Innovative Schools Project. This paper will report on the following research question:

> To what extent does participation in the RIS Project result in improved outcomes for students including: increased student enrollment and success in college-credit bearing courses (dual credit and AP), improved graduation rates, improved student attendance, decreased dropout rates, and improved student enrollment and success in college preparatory courses?

Setting: In this project, the early college model is being implemented in existing comprehensive high schools in 10 rural, low-income school districts across the state of North Carolina.

Sample: The sample included in this study is a total of 18 treatment schools matched to 18 comparison schools in North Carolina. Five treatment schools began their participation in the project in 2012-2013 and 13 schools began participating in the 2013-2014 school year. Table 1 presents an overview of the baseline characteristics of participating schools compared with the state averages.

TABLE 1 HERE

Intervention: The Rural Innovative Schools Project is designed to increase the number of students who graduate from high school and are prepared for enrollment and success in postsecondary education. The Key Components of the Rural Innovative Schools Project include a set of services that are intended to support implementation of a whole-school reform model emphasizing the creation of a college-preparatory school environment through six Design Principles. The first Key Component is *Integrated Systems of Support* that include four specific activities: 1.) a series of professional development activities centered around implementation of the six Design Principles; 2.) on-site leadership coaching for administrative teams on the Design Principles; 3.) on-site instructional coaching on the Design Principles, emphasizing the Common Instructional Framework; and 4.) staff support for the schools. The second Key Component is *Support for College Credit Courses* and includes 5.) funding for college credit courses for students; 6.) funding for a college liaison; and 7.) assistance in developing partnerships with postsecondary institutions. The final Key Component is *Activities to Influence Context,* which includes: 8.) community development work; 9.) professional development with the district; and 10.) dissemination activities. As a result of these services, each school is expected to implement six Design Principles that represent characteristics of an effective high school. These Design Principles, as articulated by North Carolina New Schools, are as follows: 1.) Ensuring that students are ready for college; 2.) Instilling powerful teaching and learning in schools; 3.) Providing high student/staff personalization; 4.) Redefining professionalism; 5.) Creating leadership that develops a collective vision; and 6.) Implementing a purposeful design in which school structures support all of the above principles. A primary emphasis of the program will

be increasing the number of students who participate in college credit-bearing courses while in high school. Figure 1 presents the logic model for the Rural Innovative Schools Project.

FIGURE 1 HERE

Research Design: The impact study uses a quasi-experimental design to assess the impact of the RIS Project on a core set of student outcomes. The treatment schools were matched to schools that were equivalent on a core set of baseline characteristics. To determine baseline equivalence, we used the same analytic approach as for the outcomes (see below), except that no covariates were included. As table 2 shows, the groups were equivalent on all baseline characteristics at levels less than .25 standard deviations. Pursuant to What Works Clearinghouse standards (Institution of Education Sciences, March, 2014), for each outcome analyses, we include as covariates each baseline measure where the difference is between 0.05 and 0.25 standard deviations.

TABLE 2 HERE

Data Collection: The study is using data collected from the schools by the North Carolina Department of Public Instruction and housed at the North Carolina Education Research Data Center at Duke University. The specific outcomes examined in this study include:

Percent of students who have enrolled in at least 1 College-Credit Bearing- Course by the end of 11th grade. A primary goal of the intervention is to increase the number of students who have access to college-credit-bearing courses. This measure is therefore designed to look at the percentage of the student body that is given access to these courses. For purposes of this study, we are looking at any course that has the potential to bear college credit, including Advanced Placement, International Baccalaureate and dual enrollment courses. A student will be coded as taking a college-credit-bearing course if they have enrolled in at least one AP, IB, or dual enrollment course by the end of 11^{th} grade.

Average number of college-credit bearing courses students have taken and passed by the end of 12^{th} grade. The previous measure spoke to access; this measure tries to get at the depth of the students' experiences with college credit through the number of courses successfully completed. NC New Schools has a goal of having at least 50% of students successfully completing at least 21 college credits. Student can receive college credit in two ways. The first way is to receive a grade of D or higher in a dual enrollment course, which is the level for which a student can receive college credit. The second way is to receive a level 3 or higher on the AP exam (which is the level accepted by many colleges). We do not include IB courses, because we do not have access to IB exam scores; however, given the relatively small number of North Carolina students who have taken IB exams (approximately 5,000 in 2009, the vast majority of which were in urban areas that are not a part of this study), we do not expect this to be problematic.

Cohort graduation rate. This outcome is a school-level outcome. Schools report their graduating students to NCPDI. As noted above, NCDPI calculates a cohort graduation rate for each school by identifying the students who were enrolled in 9^{th} grade in the school four years earlier, removing any students who transferred schools, and determining whether each student is represented in the graduation file. Students who dropped out or are missing and unaccounted for are included as non-

graduates. We will use the school-level data because NCDPI is already using the approach that we would use and they produce the official cohort graduation rates for the school.

Attendance. Student attendance has been positively associated with progress in school (Lee & Burkham, 2003); changes in student attendance are therefore seen as a reliable indicator of students' likelihood of remaining in school. The evaluation will examine the number of days that a student is absent from school.

Dropout rate. This measure examines the dropout rate for each school. Students in the dropout file are students who either completed a form indicating that they are dropping out of school or had the school indicate that they dropped out. Students who are not listed in the dropout file are considered not to have dropped out.

College preparatory course-taking. This measure looks at the proportion of students taking a core set of college preparatory courses at the 9th grade level. The courses to be examined include those that would ensure that a student is on-track for entrance into the University of North Carolina system. In 9th grade, these courses include English I and at least one college preparatory mathematics course (Algebra I, Geometry, Algebra II, Integrated Math I, Common Core Math I or higher). Research has shown that it is extremely challenging for students who are off-track for college in 9th grade to catch up (Finkelstein & Fong, 2008). Examining the percentage of students taking these courses is a measure of the extent to which the school provides access to courses needed for college to a wide range of students. Students who dropped out will be assumed to have not taken college prep courses after dropping out.

College preparatory course-taking and success. This measure is very closely related to the previous measure and is the percentage of students taking and succeeding in English I and at least one college preparatory math course in the 9th grade. Successful completion will be defined as passing the course with a grade of C or higher. While the first measure speaks to access, this second measure of successful course completion captures both access and success in school and does not penalize schools that are expanding access to more students. Students who dropped out will be assumed to have not taken college prep courses after dropping out.

Analysis: We use hierarchical linear modeling (HLM) (Raudenbush & Bryk, 2002) as the general analytic framework within which we will examine impacts of interest to account for the nested structure of the data. In most cases, where student-level data is available, students will be nested within schools. Schools are also nested within districts, however, because the sample is comprised of rural districts there is typically only one high school per district. Due to such confounding and because we have no substantive questions related to district effects, we do not model district-level nesting. For binary outcomes, we use linear probability modeling (LPM) because these are appropriate and return similar results to alternative non-linear specifications that involve logistic or probit regressions as long as most of the observations are not in close vicinity of 0 or 1. Compared to nonlinear specifications, results from linear probability models are more easily interpreted because the estimated coefficients yield marginal effects (Angrist & Pischke, 2008).

Results: We are in the process of finalizing the analyses for the 2012-2013 results for Cohort 1. We have constructed the datasets for the 2013-2014 school year and will have completed analyses prior

to the spring presentation. Thus, our conference presentation will include impact estimates for the first two years of implementation for the first cohort of schools and for the first year of implementation for the second two cohorts of schools. We will present results for all of the outcomes noted above.

Conclusions: The results from this study, particularly when coupled with evaluations of the other i3 projects, will show the extent to which implementation of early college strategies in comprehensive high schools can have the same impact as the stand-alone early college model.

Appendix A: References

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Appendix B: Tables and Figures

Table 1: Background Characteristics of Participating Schools

Treatment Cohort	Student Enrollment	% Students in Poverty	% Under-represented Minority Students	On-Time Grad Rate Avg (5 year average)	Percent Enrollments in AP/IB/ College Credit Courses	Attendance Rate	Avg. Pass Rate Core Subjects
Cohort 1 (11-12)	615	59.3%	23.8%	74.0%	2.1%	94.5%	80.0%
State Average (11-12)	943	48.1%	41.4%	79.1%	5.2%	94.4%	79.8%
Cohort 2 (12-13)	708	54.5%	29.5%	78.1%	2.9%	94.3%	40.2%
Cohort 3 (12-13)	509	68.4%	61.7%	74.6%	2.4%	92.9%	28.3%
State Average (12-13)	975	48.4%	41.1%	81.2%	5.2%	94.2%	39.4%

Note. State averages calculated using only traditional public high schools that serve grades 9 -12 (Source: NC Report Card Data). All non-traditional high schools were removed from the analytic file to provide a more accurate comparison of cohort descriptives to state averages.

Figure 1: Rural Innovative Schools Logic Model

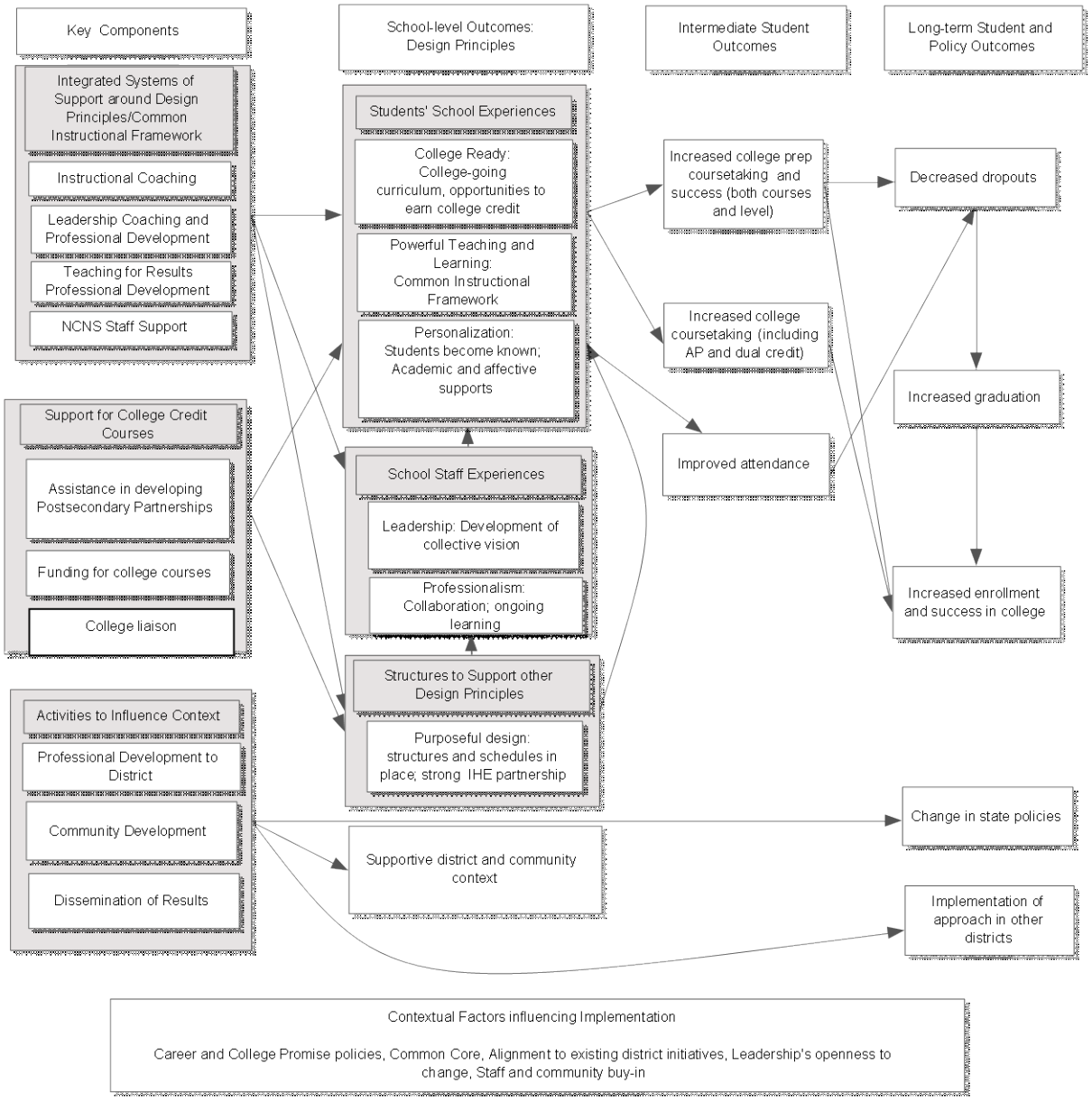

Table 2: Baseline equivalence for treatment and comparison groups

Baseline Measure	Treatment	Comparison	Effect Size
% course enrollments in AP/IB/Dual credit	2.66%	2.52%	-0.13*
Graduation Rate	80.54%	81.72%	0.16
Attendance Rate	93.83%	93.59%	-0.17*
Dropouts	3.24%	3.35%	.07*
% enrolled and succeeding in college preparatory courses	82.07%	81.80%	-.01
% poverty[a]	58.79%	57.68%	-.10*
% underrepresented minority[a]	36.14%	37.85%	.07*

[a]All outcomes with the exception of graduation rates are calculated by aggregating student-level data. Because different outcomes have different levels of missing data associated with them, the percentages of poverty and underrepresented minority students vary slightly for the samples used in the different outcomes. The percentages presented here are associated with the first outcome--% course enrollments in advanced courses.