

## **The Impact of Early Colleges on Students' Postsecondary Degree Completion**

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**Background:** North Carolina's Early College model is the subject of an IES- and Arnold Ventures-funded thirteen-year longitudinal experimental study utilizing a lottery-based design. Previous analyses have found positive impacts on enrollment in postsecondary education and early attainment of postsecondary credentials (Edmunds, Unlu, Furey, Glennie, & Arshavsky, 2019; Edmunds et al., 2017). This paper extends this research by examining the impact of the model on students' attainment of two- and four-year postsecondary degrees four and six years after twelfth grade and studying patterns in time to degree among those who obtained degrees.

**Purpose:** The specific research questions driving this study include:

1. What is the impact of the early college on students' attainment of postsecondary credentials? To what extent do these impacts differ by student sub-group?
2. How long does it take treatment students to earn a degree as compared to control students?

**Intervention:** Early colleges, as studied in this project, are small high schools of choice located on college campuses. Targeted at students who are underrepresented in college and serving students in grades 9-12 or 13, the schools aim to provide students with a high school diploma and an associate degree or two years of transferable college credit. As implemented in North Carolina, early colleges are also expected to implement a set of Design Principles (Figure 1).

### FIGURE 1

**Research Design:** Results presented in this proposal are from a longitudinal student-level randomized control trial (RCT). These applicants were randomly assigned through a lottery process to either receive the offer to attend the early college (treatment group) or to attend business as usual, usually the comprehensive high school in the district (control group).

**Population:** The sample analyzed for this paper includes a total of 1,687 students (952 treatment and 735 control) who applied to 19 early colleges in North Carolina from 2005-2006 through 2008-2009. The baseline characteristics for the sample are shown in Table 1. Compliance with the initial random assignment status was fairly large (92 percent among treatment students and 99 percent among control students).

### TABLE 1

**Data Sources and Outcomes:** To assess the impact of the early college on students' postsecondary credentials, we linked degree data from the National Student Clearinghouse to early college application data as well as middle and high school administrative data from the North Carolina Department of Public Instruction. Postsecondary credentials included bachelor's

degrees, associate degrees, and technical credentials. Results are provided overall and by credential type for four years and six years after 12<sup>th</sup> grade.

Separate analyses were also conducted for three different sub-groups that were target populations for the initiative: students who are members of racial and ethnic groups underrepresented in college; students who were first in their family to go to college; and economically disadvantaged students. We also analyzed results for two additional sub-groups of interest: gender and baseline achievement levels.

**Analyses:** Each degree attainment measure was used as the dependent variable in multivariate regression models that include lottery indicators, baseline covariates, and a treatment group indicator, which yielded the estimated impact of the ECHS on that outcome. Statistical inference was based on cluster-robust standard errors calculated based on the school that students attended the longest. Because students could earn both an associate degree and a bachelor's degree, results were also analyzed by the following mutually exclusive categories: 1) earning only a technical certificate, 2) earning only an associate degree; 3) earning only a bachelor's degree; and 4) earning both an associate and bachelor's degree.

The time to degree was analyzed descriptively for each student who earned a degree in the treatment and control group.

**Results:** Table 2 presents the impacts of the model on degree attainment. As the results show, there was a large positive impact on degree attainment, driven in large part by large positive impacts on associate degree attainment. Four years out (Grade 16), there was also a positive impact on four-year degree attainment, but this impact disappeared by six years out (Grade 18). On the other hand, the impact on associate degrees increased slightly by six years out.

TABLE 2 HERE

When looking at the mutually exclusive degree categories, we see that approximately half of the associate degree earners also went on to earn a bachelor's degree while the remaining half only earned an associate degree.

Table 3 presents the Grade 18 degree attainment results by sub-group. When looking at attainment of associate degrees by sub-groups, we see that the impacts were larger among more advantaged populations. This is likely because the model was encouraging students to obtain an associate degree (in many cases on their way to a bachelor's degree) who might not otherwise have done so. On the other hand, when we look at four-year degree attainment, we see the only statistically significant positive result occurring for economically disadvantaged students, which suggests that the model was making four-year education more affordable for these students.

TABLE 3 HERE

Figure 2 shows the timing of two-year and four-year degree acquisition by the treatment and control students, respectively. This figure suggests that treatment students obtained their degrees at a faster pace than control students. We also examined average time to degree within the

treatment and control groups and found that treatment students who earned an associate degree did so approximately two years earlier than the control students. Treatment students who earned a bachelor's degree did so approximately half a year earlier than control students.

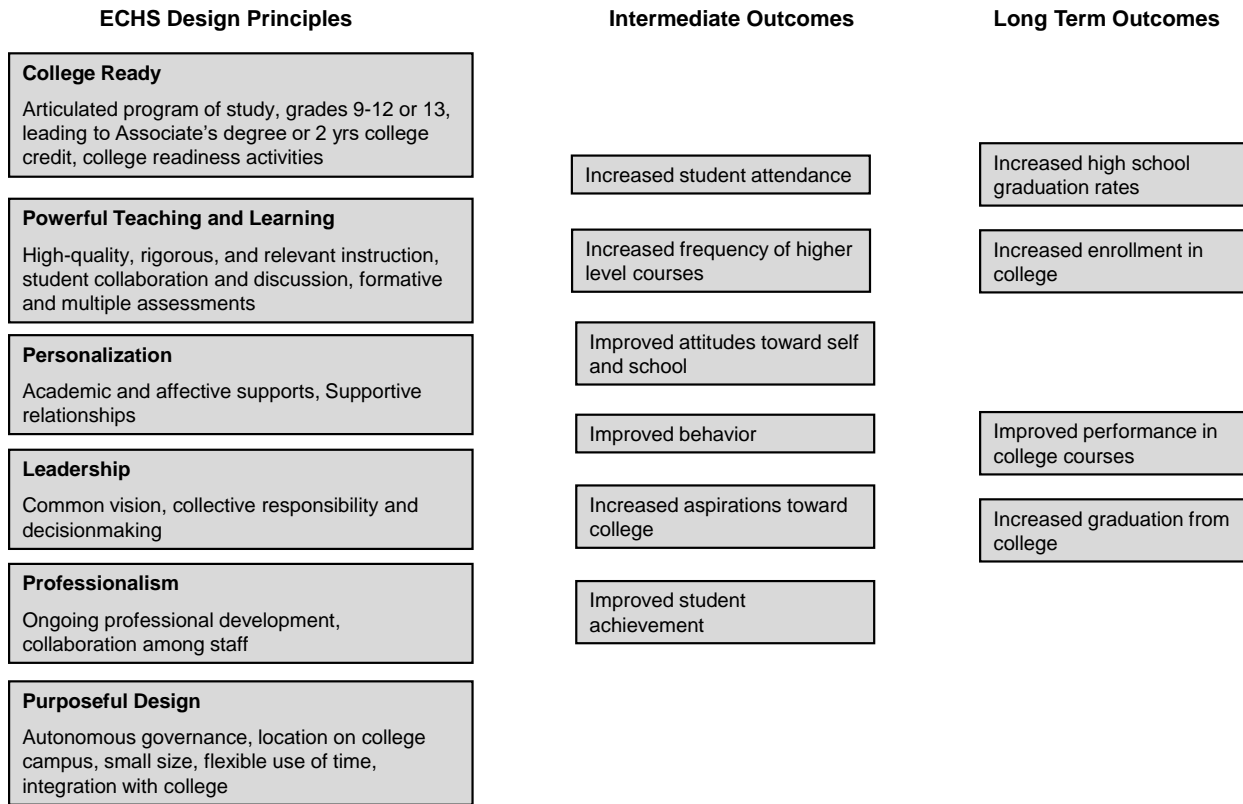
FIGURE 2 HERE

**Conclusions:** Results show that the early college model had a positive impact on overall degree attainment, driven in large part by associate degrees. Some of the students earning an associate degree did so on their way to a bachelor's degree while others would not have earned any sort of credential. This impact makes sense given that earning an associate degree is an expectation of the model. The results also suggest that the model facilitated completion of a four-year degree for economically disadvantaged students who may otherwise have struggled to complete school. Finally, the model shortened the time to degree enabling students to enter the workforce more rapidly.

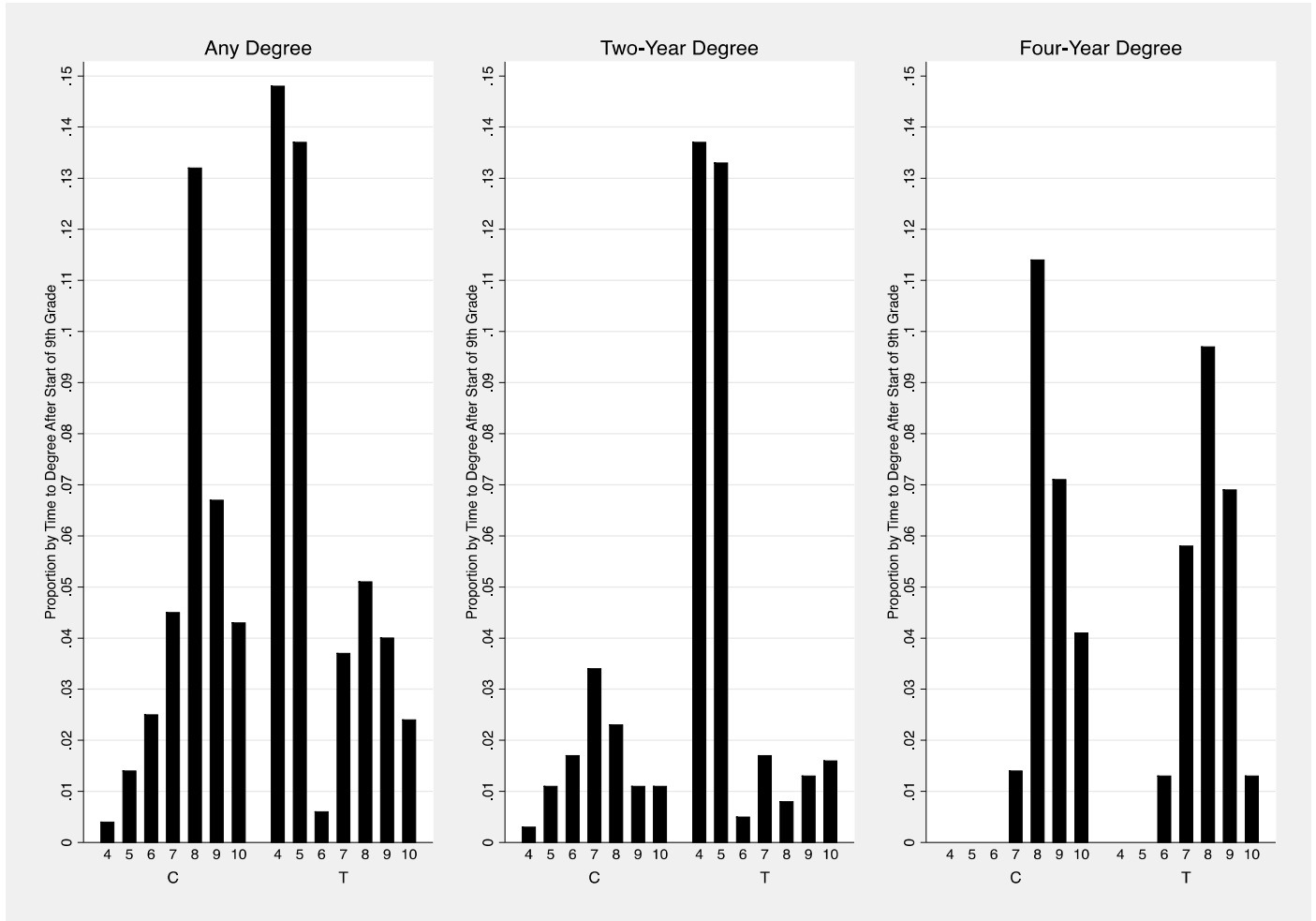
### References:

- Edmunds, J. A., Unlu, F., Furey, J., Glennie, E., & Arshavsky, N. (2019). *What happens when you combine high school and college? The impact of the early college model on postsecondary performance and completion*. Working paper. .
- Edmunds, J. A., Unlu, F., Glennie, E., Bernstein, L., Fesler, L., Furey, J., & Arshavsky, N. (2017). Smoothing the transition to postsecondary education: the impact of the early college model. *Journal of Research on Educational Effectiveness*, 10(2), 297-325.

**Figure 1: Early College Logic Model**



**Figure 2: Time to degree, by treatment status and by level of degree**



Note: The x-axis shows years since entering grade 9, e.g., the value “4” indicates getting a degree by the end of grade 12.

**Table 1: Sample Characteristics, by Treatment Status**

	Whole Sample (N=1687)	Treatment Group (N=952)	Control Group (N=735)	T-C Difference		Effect Sizes
	Mean	Mean	Mean	Difference	P-Value	
<b>Race &amp; Ethnicity</b>						
American Indian	0.80%	0.79%	0.81%	-0.03%	0.953	-0.02
Asian	0.92%	1.01%	0.81%	0.20%	0.671	0.14
Black	26.53%	27.32%	25.50%	1.82%	0.406	0.06
Hispanic	8.26%	9.18%	7.05%	2.13%	0.119	0.17
Multi racial	3.12%	2.48%	3.95%	-1.47%	0.089	-0.29
White	60.38%	59.22%	61.88%	-2.66%	0.273	-0.07
<b>Gender</b>						
Male	40.87%	40.56%	41.27%	-0.71%	0.770	-0.02
<b>Age as of Spring, Grade 9</b>	15.36	15.34	15.38	-0.04	0.068	-0.09
<b>Socioeconomic Background</b>						
First Generation College Free/Reduced Price Lunch Eligibility	40.83%	41.08%	40.50%	0.58%	0.816	0.01
	50.69%	51.34%	49.86%	1.48%	0.561	0.04
<b>Exceptionality</b>						
Disabled/Impaired	2.88%	2.43%	3.51%	-1.07%	0.211	-0.23
Gifted	14.75%	13.89%	15.93%	-2.04%	0.259	-0.09
<b>Retained</b>	4.10%	3.10%	5.45%	-2.35%	0.01*	-0.37
<b>8th Grade Achievement</b>						
Math - Z score	0.00	-0.03	0.03	-0.06	0.225	-0.06
Reading - Z score	-0.01	-0.02	0.01	-0.03	0.519	-0.03

Notes: \*Statistically significant at  $p < .05$ .

**Table 2: Impact of the Early College Model on Attainment of a Postsecondary Credential**

	N	Adjusted Treatment Mean	Unadjusted Control Mean	Impact Estimate	Standard Error
<b>Attainment of any Postsecondary credential by Grade 16</b>	1687	37.8%	22.0%	15.8% **	3.3
Attainment of associate degree	1687	30.0%	8.8%	21.2% **	3.1
Attainment of technical credential	1687	2.5%	2.5%	0%	0.9
Attainment of bachelor's degree	1687	16.7%	12.8%	3.9% *	1.9
<b>Attainment of any Postsecondary credential by Grade 18</b>	1687	44.3%	33.0%	11.3% **	2.9
Attainment of associate degree	1687	32.8%	11.0%	21.8% **	2.9
Attainment of technical credential	1687	3.5%	3.1%	0.4%	1.0
Attainment of bachelor's degree	1687	24.9%	24.0%	0.9%	2.2
<b>Attainment of postsecondary credentials by Grade 18 (Mutually exclusive categories)</b>					
Earning only a technical credential	1687	1.9%	1.9%	0.0%	0.7
Earning only an associate degree	1687	17.4%	7.1%	10.3% **	1.6
Earning only a bachelor's degree	1687	9.6%	20.2%	-10.6% **	2.5
Earning both an associate and bachelor's degree	1687	15.3%	3.8%	11.5% **	1.9

Notes: Adjusted treatment group mean is obtained by adding the impact estimate to the unadjusted control group mean. Statistical inference is conducted based on cluster-robust standard errors calculated according to the high school students were enrolled the longest. \* significant at  $p \leq .05$ ; \*\*significant at  $p \leq .001$ .

**Table 3: Impact of the Early College Model on Attainment of a Postsecondary Credential, by Subgroup**

	N	Adjusted Treatment Mean	Unadjusted Control Mean	Impact Estimate	Standard Error
<b>Attainment of associate degree by Grade 18</b>					
Underrepresented minority	582	20.9%	5.9%	15.0%**	3.5
Non-underrepresented minority	1071	39.8%	13.2%	26.6%**	3.1
<i>Differential impact</i>				-11.6%*	4.7
First generation college-goers	652	26.5%	9.8%	16.7%**	3.4
Non-first generation college-goers	956	38.0%	11.8%	26.2%**	3.4
<i>Differential impact</i>				-9.5%	4.8
Economically disadvantaged	790	22.9%	7.9%	15.0%**	4.1
Non-economically disadvantaged	779	42.5%	13.9%	28.6%**	3.6
<i>Differential impact</i>				-13.6%*	5.5
Underprepared students	481	13.5%	7.3%	6.2%*	2.5
Prepared students	1088	42.8%	12.9%	29.9%**	3.3
<i>Differential impact</i>				-23.7%**	4.1
Male	672	30.3%	10.0%	20.3%**	2.9
Female	976	35.4%	11.5%	23.9%**	3.7
<i>Differential impact</i>				-3.6%	4.7
<b>Attainment of bachelor's degree by Grade 18</b>					
Underrepresented minority	582	25.0%	23.2%	1.8%	3.3
Non-underrepresented minority	1071	25.1%	24.1%	1.0%	2.4
<i>Differential impact</i>				0.8%	4.1
First generation college-goers	652	17.0%	16.4%	0.6%	2.6
Non-first generation college-goers	956	31.5%	29.8%	1.7%	3.2
<i>Differential impact</i>				-1.1%	4.1
Economically disadvantaged	790	21.3%	16.8%	4.5%*	2.2
Non-economically disadvantaged	779	29.4%	30.6%	-1.2%	3.6
<i>Differential impact</i>				5.7%	4.2
Underprepared students	481	13.3%	12.1%	1.2%	3.0
Prepared students	1088	30.1%	30.1%	0.0%	2.6
<i>Differential impact</i>				1.2%	4.0
Male	672	20.3%	18%	2.3%	2.4
Female	976	29.4%	28%	1.4%	2.9
<i>Differential impact</i>				0.9%	3.8



*Notes:* Adjusted treatment group mean is obtained by adding the impact estimate to the unadjusted control group mean. Statistical inference is conducted based on cluster-robust standard errors calculated according to the high school students were enrolled the longest. \* significant at  $p \leq .05$ ; \*\*significant at  $p \leq .001$ .