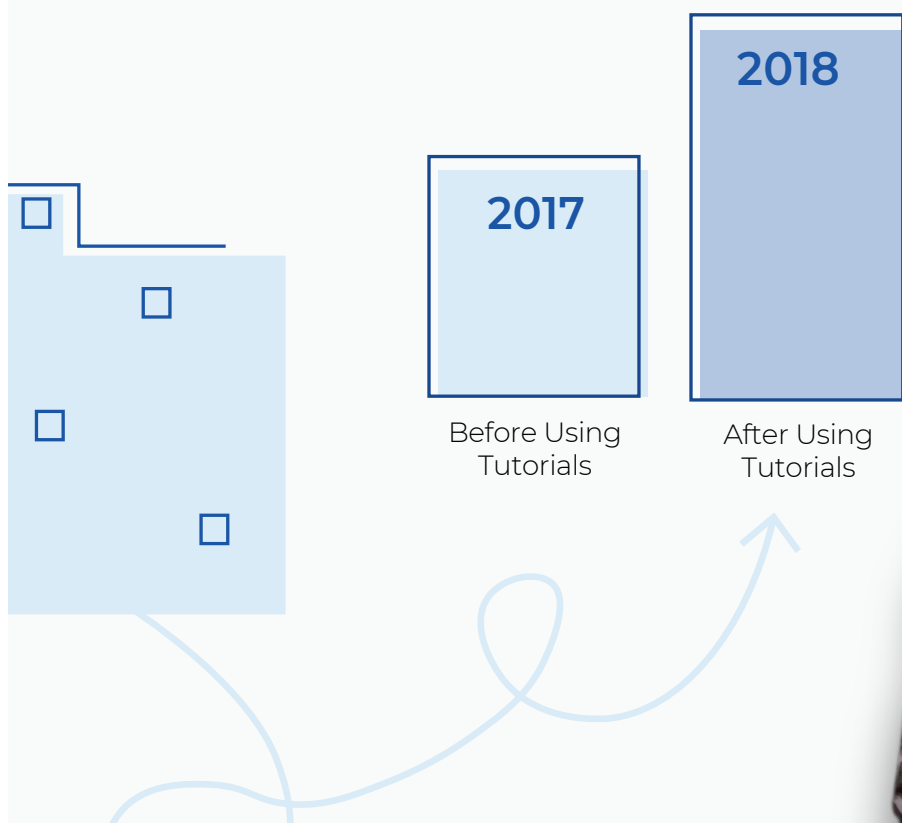**Apex Learning®**

Preparing Students for the ACT®

A Small Public School District in Johnsonville, SC

April 2019

Overall, the ACT® scores of juniors improved after using Apex Tutorials

2018

2017

Before Using Tutorials

After Using Tutorials

Executive Summary

Results of research conducted by Hanover Research suggest that using Apex Learning ACT® Tutorials for test readiness improves achievement on the ACT® English and Mathematics tests.

Eleventh grade students in a small public school district in Johnsonville, South Carolina, used Apex Learning ACT® Tutorials for two months to prepare for the 2018 ACT® exam. To determine the impact of Tutorials on the ACT® exam, Apex Learning engaged Hanover Research to conduct a correlational study examining the relationship between Apex Learning ACT® Tutorials use and student achievement on the ACT®. Hanover compared the average ACT® achievement of students using Tutorials to students not using Tutorials in 2017, to Tutorials users, Pre-ACT® (PACT) achievement prior to using Tutorials, and to the state average.

The results suggest:

Overall, the ACT® scores of juniors improved from before using Tutorials (2017) to after using Tutorials (2018).

Tutorials users scored higher on the ACT® by 8% in English, 10% in Math, and 5% in Reading.
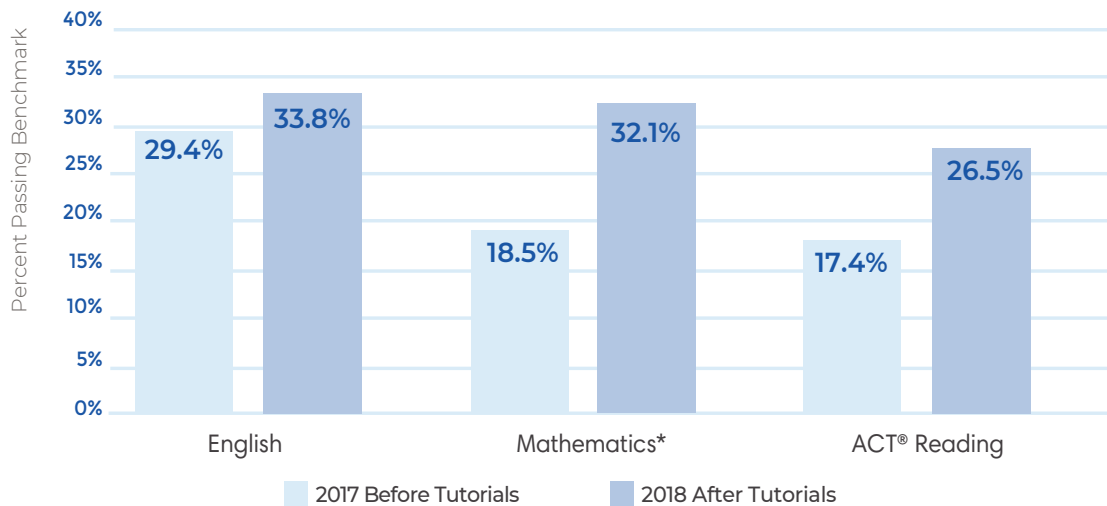
Figure 1.1:

Average ACT® Score by Year
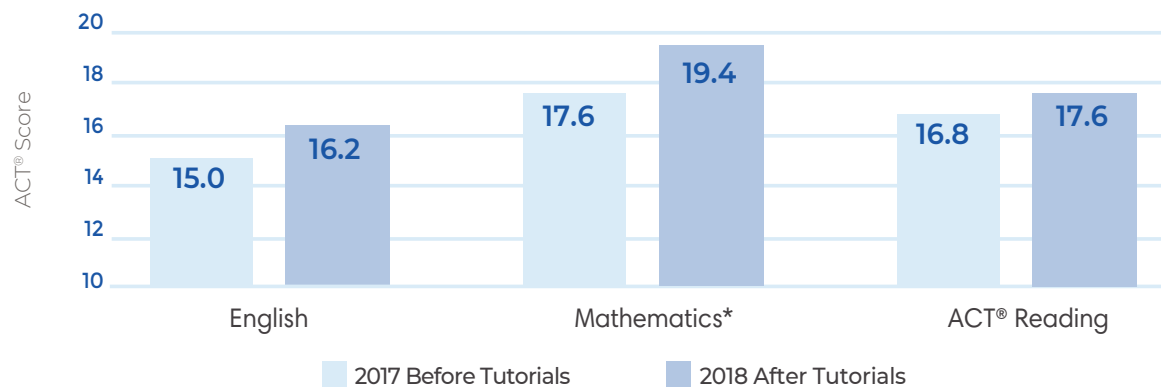
* Difference statistically significant. p<.05

Students using Tutorials are more likely to meet or exceed the ACT® College Readiness Benchmarks than students not using Tutorials.

Students using Tutorials were more likely to meet College Readiness Benchmarks set by the ACT® by 15%,74%, and 52% for English, Math, and Reading, respectively compared to non-users.

Figure 1.2:
Percent Passing the ACT® College Readiness Benchmark

English: 29.4% / 33.8%; Mathematics*: 18.5% / 32.1%; ACT® Reading: 17.4% / 26.5%

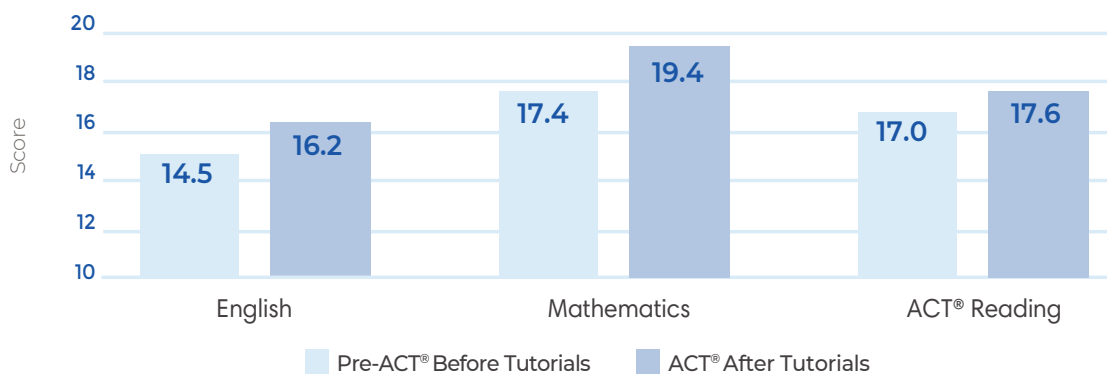2017 Before Tutorials — 2018 After Tutorials

* Difference statistically significant. $p < .05$

Students using Tutorials experience growth from the PACT to the ACT®

After using Tutorials, the average score from Pre-ACT® (PACT) to ACT® improved 12% in English, 11% in Mathematics, and 4% in Reading.

Figure 1.3:
Average PACT and ACT® Score

English: 14.5 / 16.2; Mathematics: 17.4 / 19.4; ACT® Reading: 17.0 / 17.6

Pre-ACT® Before Tutorials — ACT® After Tutorials

The average ACT® Math score trends higher for students who used Tutorials than for public school students in South Carolina.

The average ACT® Math score of students using Tutorials was 8% greater than that of public-school students statewide.

Figure 1.4:

2018 Average State and District ACT® Score
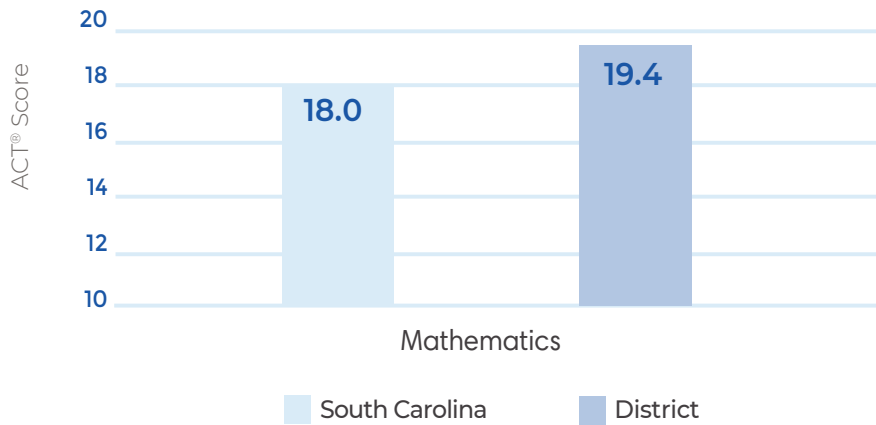
Introduction

To improve student achievement on the ACT®, a high school in a small public school district in Johnsonville, SC, used Apex Learning ACT® Tutorials in a school-wide test readiness program. The goal of the readiness program was to prepare 11th grade students to increase performance on the ACT.

The test readiness program was highly structured and implemented school-wide by all English and math teachers teaching students in 11th grade.

Each Monday during English and math class time, students completed an assigned ACT® Tutorials pretest from the school computer lab for one hour. As homework, students were assigned to complete modules prescribed by Tutorials based on each student's pretest results. The following Monday, students completed the corresponding posttest. Students were given a grade for completing Tutorials assignments.

After two months of implementation, students completed the ACT® administered by the South Carolina Department of Education in the spring of 2018.

Figure 2.1

Demographic Characteristics

Total Number of Students. 1,325
Urban Locale . . . . .Rural

American Indian/AK Native 0.3%
Asian 0.3%
Black /African American. 29.4%
HI/Pacific Islander 0.00%
White 65.4%
Hispanic. 2.5%
Multiracial 2.0%

Free/Reduced Meals 62.1%
Limited English Proficient 1.6%

Study Purpose

Apex Learning contracted Hanover Research, a third-party research firm, to study the impact of using Apex Learning ACT® English, Math, and Reading Tutorials on ACT® student achievement. Researchers compared the ACT® achievement of students in 11th grade using Tutorials during the 2017–2018 school year to:

1. Students in 11th grade during the 2016-2017 school year prior to using Tutorials.

2. Tutorials users' Pre-ACT (PACT) results from 10th grade (2016-2017)

3. State average ACT subscore results from the 2017-2018 school year.

One hundred seventy Tutorials enrollments were used by 68 students in 11th grade. Figure 2.2 shows the demographic characteristics of students in the study using Tutorials.

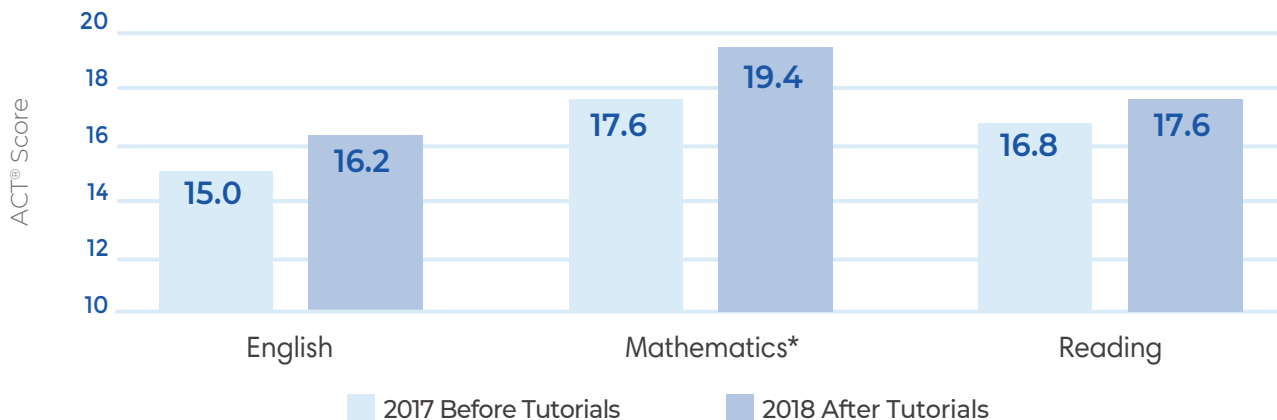|	
Asian	13%
Other	9%
White	69%
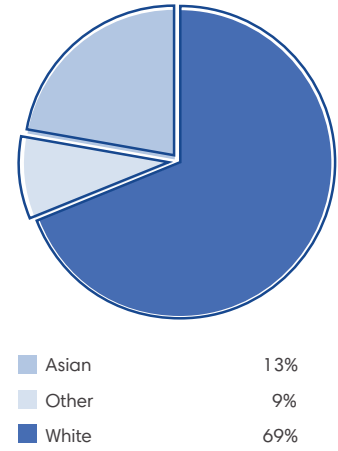
Results

Overall, the ACT® scores of juniors improved from before using Tutorials (2017) to after using Tutorials (2018).

ACT® scores of students using Tutorials trended higher in all three subtests compared to students not using Tutorials. Tutorials users scored higher by 8% (1.18 points) in English, 10% (1.81 points) in Math, and 5% (.79 points) in Reading. The effect size was significant for English and Math. The difference was statistically significant for Math.

Figure 2.3:
Average ACT® Score by Year

English: 15.0 (2017 Before Tutorials), 16.2 (2018 After Tutorials)
Mathematics*: 17.6 (2017 Before Tutorials), 19.4 (2018 After Tutorials)
Reading: 16.8 (2017 Before Tutorials), 17.6 (2018 After Tutorials)

■ 2017 Before Tutorials   ■ 2018 After Tutorials
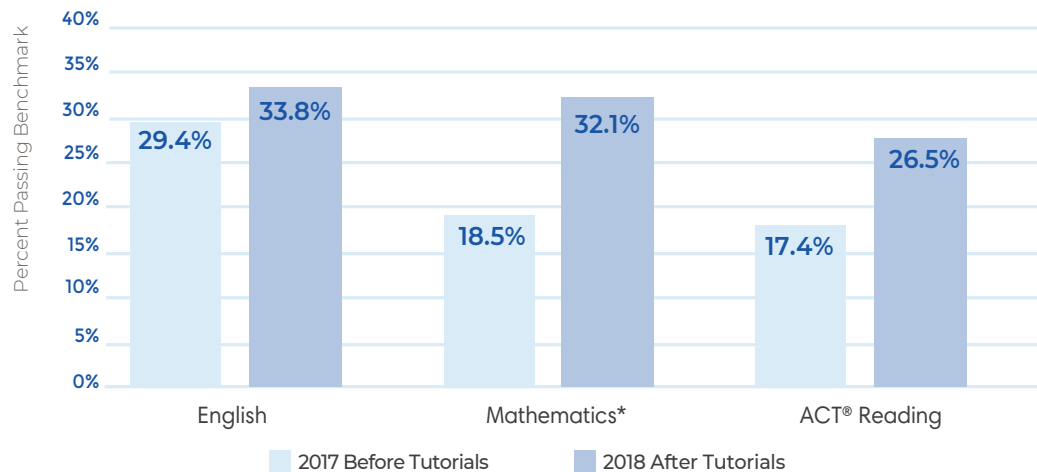
* Difference statistically significant. $p < .05$

Compared to students not using Tutorials from the year prior, students using Tutorials were more likely to meet College Readiness Benchmarks set by the ACT® (Figure 2.4). The percent of Tutorials users were college ready exceeded Tutorials non-users by 15%, 74%, and 52% for English, Math, and Reading respectively.

Percent Passed College Readiness Benchmark by Year

* Difference statistically significant. p<.05

When examining the students using Tutorials, students experience growth from the PACT to the ACT®.

Two-thirds of students exhibited growth from PACT (before using Tutorials) to ACT® (after using Tutorials) in English and Math. One-third of students exhibited growth in Reading.

Figure 2.5: PACT and ACT® Growth Summary

Growth Outcomes	Mean	Standard Deviation	Minimum	Maximum	Positive Growth
PACT to ACT® English Growth	1.71	3.13	-5	12	67.65%
PACT to ACT® Mathematics Growth	1.98	2.43	-2	8	67.92%
PACT to ACT® Reading Growth	0.57	4.18	-7	11	37.78%

After using Tutorials, the average score from PACT to ACT® improved 12% (1.71 points) in English, 11% (1.98 points) in Mathematics, and 4% (0.57 points) in Reading.
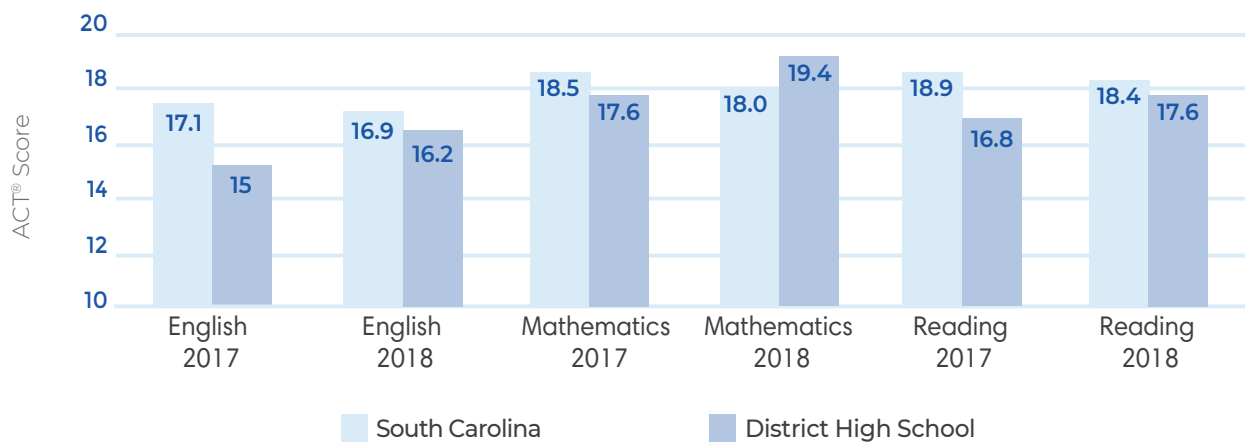
Figure 2.6:

Average 10th Grade PACT and 11th Grade ACT® Score

Pre-ACT® Before Tutorials   ACT® After Tutorials
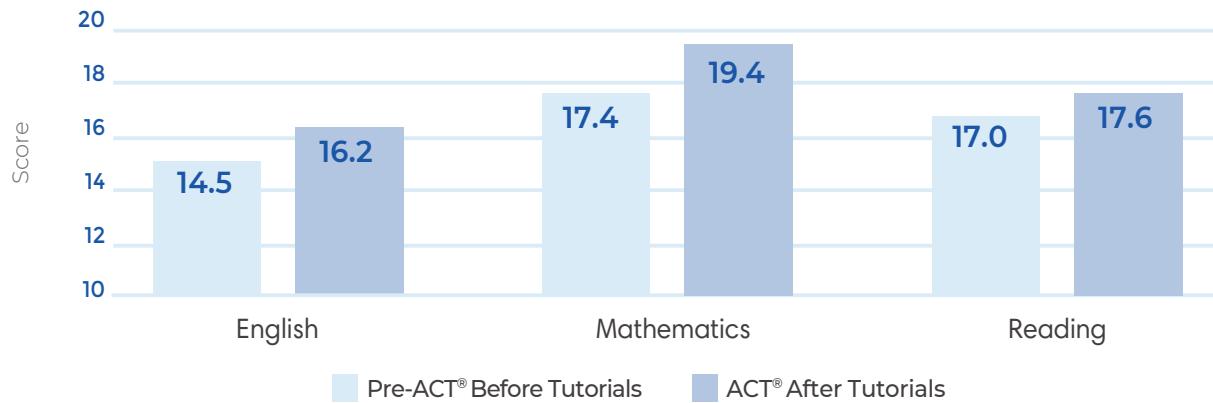
Compared to students across South Carolina, students at a small district high school in Johnsonville, SC, using Tutorials achieved greater average ACT® Math scores.

The average ACT® Math score of students using Tutorials was 8% (1.4 points) greater than that of publicschool students statewide. The difference between the ACT scores for the District and the State are smaller in 2018 for English and Reading after using Tutorials compared to the difference between the English and Reading scores in 2017. This shows progress is closing the gap.

Figure 2.7:

2018 Average State and District High School ACT® Score

South Carolina   District High School

Note: State average scores include 11th grade and 12th grade students.

ACT® subscores are highly and significantly correlated with ACT® Tutorials performance measures.

Figure 2.8 shows the regression coefficient and correlation coefficient between ACT® scores and Tutorials performance measures. The ACT® English score is significantly correlated with four Tutorials performance measures. Of these, the strongest relationship was with the number of Tutorials pretests completed (r=.61). The regression coefficient for Tutorials pretests is 2.32. This suggests that on average, each Tutorials pretest a student took was associated with 2.32 more points on the ACT® English test.

For ACT® Math, six performance measures were significantly correlated with the Math score. The strongest relationship was with the number of Tutorials posttests completed (r=.78). The regression coefficient suggests that each Tutorials posttest completed was associated with .84 more points on the ACT® Math test.

For ACT® Reading, one performance measure was significantly correlated with the reading score (r=.58). The regression coefficient suggests that each quality of work point achieved is associated with an additional .15 points on the ACT® Reading test.

0.78Figure 2.8: ACT® Score Statistics0.53				
0.49Subject	Variable	Regression Coefficient	Correlation	Sample Size
ACT® English	Tutorials Sessions (Count)	.29*	0.18	68
	Pretests (Count)	2.32***	0.61	68
	Posttests (Count)	.78***	0.43	68
	Adj. Quality of Work ex. Prestests (%)	.15***	0.58	68
ACT® Math	Time Spent on Tutorials (Hours)	.56***	0.67	53
	Tutorials Sessions (Count)	.51***	0.67	53
	Test-Its (Count)	.28***	0.72	53
	Postests (Count)	.84***	0.78	53
	Adj. Quality of Work ex. Prestests (%)	.11***	0.53	53
	Percentage Point Gain (%)	.25***	0.49	53
ACT® Reading	Adj. Quality of Work ex. Prestests (%)	.15***	0.670.580.72	37

*p,0.10, **p<.05, ***p<.01. Significance stars denote the statistical significance of the relationship between the outcome (ACT® score) and the corresponding explanatory variable for both the regression coefficient and the correlation coefficient.
Note: Only statistically significant variables are shown.

Limitations

The evaluation of the impact of Tutorials use on ACT® scores is limited in two ways. First, students in the 2017 cohort did not take the PACT and therefore the comparison between ACT® scores from 2017 to 2018 could not be controlled for prior ability. As a result, it is not possible to determine if the improvement is attributable to Apex Learning or differences in prior ability between groups. The demographic table located in the appendix is provided to help the reader determine how closely the two groups may be related.

Second, the analysis of gain from the PACT to ACT® does not include a comparison group of students who did not use Tutorials. As a result, the gain made by students using Tutorials does not control for maturation that normally occurs from one school year to the next.

Conclusion

A high school in a small district in Johnsonville, SC, uses Apex Learning ACT® Tutorials in a test readiness program for students in 11th grade designed to increase student achievement on the ACT®.

This study compared the ACT® achievement of students who used Tutorials to students in 11th grade from the prior school year, Tutorials user PACT results prior to Tutorials use, and the 2018 state average. Findings suggest:

- Compared to juniors from the year prior to using Tutorials, students in 11th grade who used Tutorials improved on the ACT® English test by 8%, ACT® Math test by 10%, and ACT® Reading test by 5%. Additionally, the percent of Tutorials users that were college ready exceeded Tutorials non-users by 15%, 74%, and 52% for English, Math, and Reading, respectively.
- Students using Tutorials experienced growth from the (10th grade) PACT to the (11th grade) ACT® English and Math tests by 11% and 12% respectively.
- The average ACT® Math score of students using Tutorials was 8% greater than that of public-school students statewide.
- There is a significant substantial relationship between Apex Learning ACT® Tutorials performance measures and achievement on the ACT® subject tests.

Data and Methodology

Data

Test Scores – The small district in Johnsonville, SC, provided student-level ACT® English, Math, and Reading scores and demographic characteristics for students completing the ACT® during the 2016–2017 school year and 2017–2018 school year. Demographic variables included free/reduced price lunch status, disability status, limited English proficiency status, race/ethnicity, and date of birth. The district also provided the PACT scores administered to 10th grade students during the 2016–2017 school year. The PACT was not administered during the 2015–2016 school year and therefore could not be used as a control variable for students not using Tutorials in 2016–2017.

Student-Level Tutorials Performance – Apex Learning provided student-level enrollment and performance data for Apex Learning ACT® Tutorials for titles including ACT® English, ACT® Mathematics, and ACT® Reading. Performance variables provided include: quality of work excluding pretests; number of pretests, posttests.

Methodology

Hanover Research conducted a descriptive analysis that incorporates both bivariate regressions and correlations between pairs of explanatory and outcome variables.

References

Hanover Research (March 2019). Apex Learning ACT® Tutorials Analysis. Arlington, VA.

Civil Rights Data Collection (2015). Retrieved from Ed.gov on 3/05/2019.

South Carolina ACT® Data by District (2018). Retrieved from https://ed.sc.gov/data/test-scores/national-assessments/ACT/.

Appendix

Figure A.1: Demographic Characteristics by Year				
Group	2017		2018	
	Count	Percentage	Count	Percentage
Gender				
Male	43	46.2%	40	55.8%
Female	50	53.8%	32	43.8%
Missing	-	-	1	1.4%
Race				
White	58	63.7%	48	69.6%
African-America	28	30.8%	15	21.74%
Other	5	5.5%	6	8.7%

Figure A.2: Average 2017 PACT and 2018 ACT® Scores			
Subject	PACT	ACT®	Growth
	Mean	Mean	Mean
English	14.50	16.21	1.71
Mathematics	17.43	19.42	1.98
Reading	16.98	17.55	0.57

Figure A.3: ACT® English Tutorials Use

Explanatory Variable	Mean	Standard Deviation	Minimum	Maximum	Count
Time Spent on Tutorials (Hours)	2.69	1.40	0.52	6.48	68
Tutorials Sessions (Count)	5.62	3.19	1	16	68
Pretests (Count)	2.69	1.33	1	6	68
Test Its (Count)	8.69	4.61	1	19	68
Posttests (Count)	4.53	2.82	0	11	68
Adj. Quality of Work ex. Pretests (%)	66.05	19.49	0	97	68
Percentage Point Gain (%)	11.76	22.68	-35.50	70.50	68

Figure A.4: ACT® Math Tutorials Use

Explanatory Variable	Mean	Standard Deviation	Minimum	Maximum	Count
Time Spent on Tutorials (Hours)	4.95	5.54	0.15	22.73	53
Tutorials Sessions (Count)	9.09	6.10	1	22	53
Pretests (Count)	4.96	3.19	0	11	53
Test Its (Count)	8.34	11.94	0	40	53
Posttests (Count)	2.79	4.26	0	14	53
Adj. Quality of Work ex. Pretests (%)	71.20	23.05	13	100	28
Percentage Point Gain (%)	4.42	9.02	-12.00	-12.00	53

Figure A.5: ACT® Reading Tutorials Use

Explanatory Variable	Mean	Standard Deviation	Minimum	Maximum	Count
Time Spent on Tutorials (Hours)	1.42	0.95	0.07	4.52	49
Tutorials Sessions (Count)	3.33	2.53	1	13	49
Pretests (Count)	1.35	0.83	0	4	49
Test Its (Count)	4.49	4.44	0	17	49
Posttests (Count)	1.98	2.01	0	7	49
Adj. Quality of Work ex. Pretests (%)	64.97	23.02	19	100	37
Percentage Point Gain (%)	12.15	21.97	-24.00	78.00	49

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