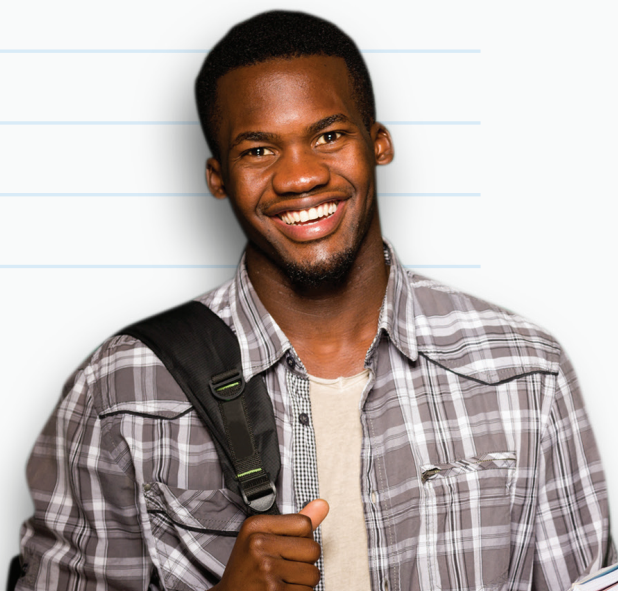
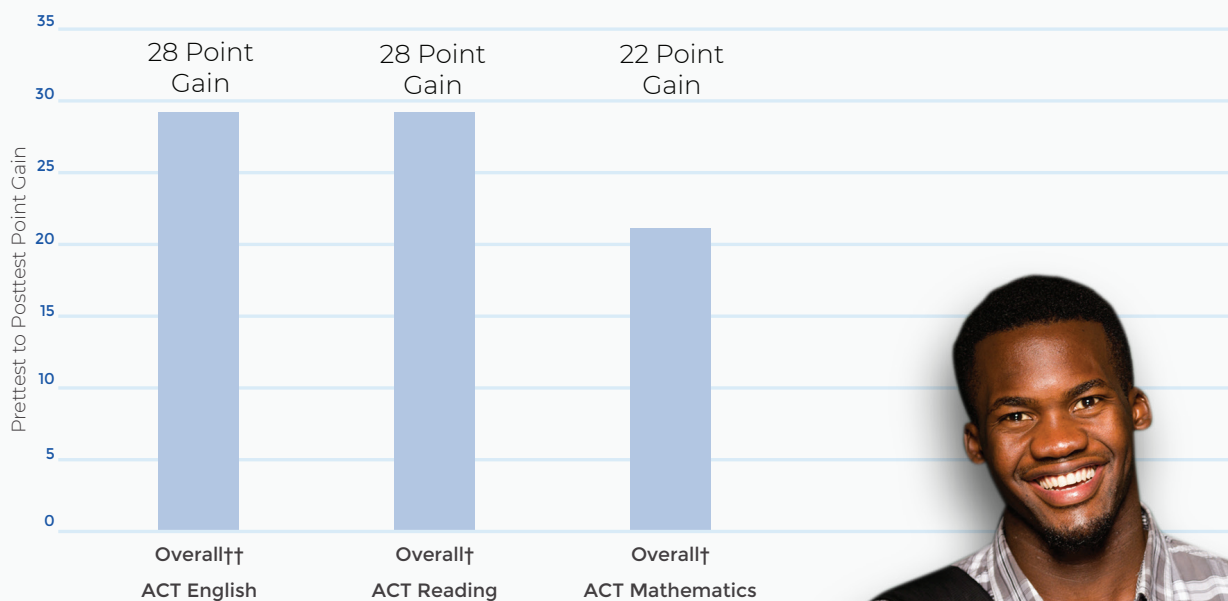




# Three Years of Gain: The Impact of Apex Learning ACT® Tutorials on Student Achievement

School Years 2016-2017 through 2018-2019

October 2019



## Introduction

Apex Learning ACT® Tutorials provide instruction, practice, and assessment aligned to concepts assessed by the ACT® English, reading, and mathematics subject tests. Tutorials pretests and embedded formative assessments build an individualized course of study for each student that continually adapts to his or her unique learning needs. Students struggling with grade-level concepts are prescribed remedial instruction of skills down to the third-grade level as needed. Students build depth of knowledge, confidence, and higher order skills through instruction and practice of skills essential to the test.

Unit-level pretests and posttests provide granular performance data that links students' performance to ACT® strand descriptions and score ranges, quickly identifying where students have demonstrated content mastery and where they still need to focus their learning.

## Purpose of Study

The purpose of this study is to examine the impact of Apex Learning ACT® Tutorials on student learning over the course of three school years. The results of 45,971 modules with pretests, Test Its, and posttest scores across three school years were included in the analytical dataset. Tables showing Tutorials descriptive statistics and the results for all statistical tests are located in the appendix.

## Key Findings

*Apex Learning ACT® Tutorials significantly improved student performance on Tutorials posttest assessments across English, reading, and mathematics for three straight years.*

Results of paired-samples t-tests (Table 2, appendix) suggested that ACT® Tutorials had a statistically significant impact on student gains from Tutorials pretest to posttest achievement for all school years by subject. Overall school years, the average gain for English was 69%, reading at 75%, and mathematics at 49%. The magnitude of the effect was large across subjects and school years.

Figures 1 – 3 illustrate the average pretest, posttest, and percentage point gain by subject and school year.

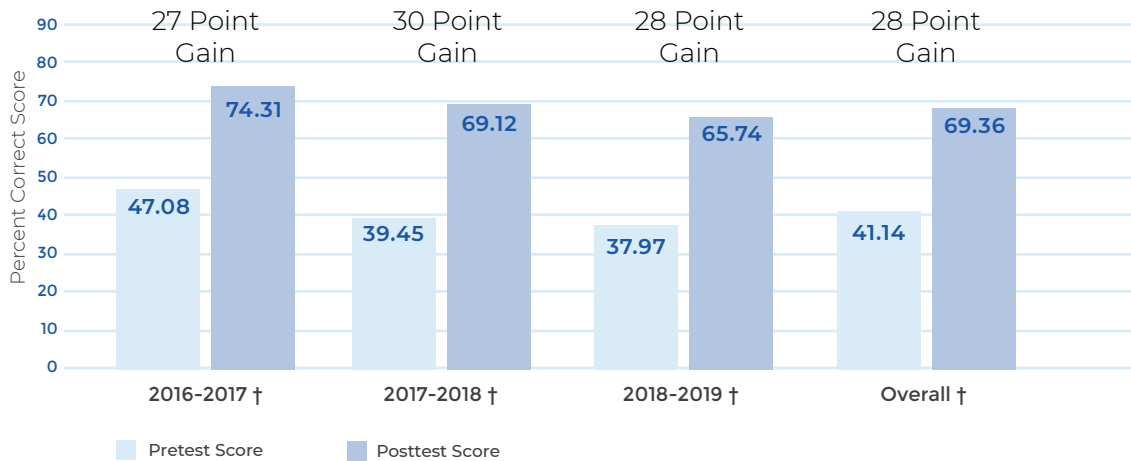
### ACT® English Tutorials

Following the use of ACT® English Tutorials:

- Tutorials gains from pretest and posttest score ranged from 27 to 30 points over three years. Relative to pretest performance, the gains are equal to a 58%, 75%, and 73% improvement for 2016-2017, 2017-2018, and 2018-2019 respectively. Over the three-year span, the average gain was 69%.
- The magnitude of the effect of Tutorials use on posttest achievement was large for all three school years ( $d=.86, .98, .97$  respectively).

Figure 1 shows the average pretest score, posttest score, and gain following use of ACT® English Tutorials.

**Figure 1**  
ACT® English: Average Pretest, Posttest, and Percentage Point Gain



†Differences between pre- and posttest for each school year are statistically significant. (Sig.  $p<.05$ ).  
Note: The number of modules included in the analysis by school year ranges from 6,045 to 7,790 and overall is 20,459.

### ACT® Reading Tutorials

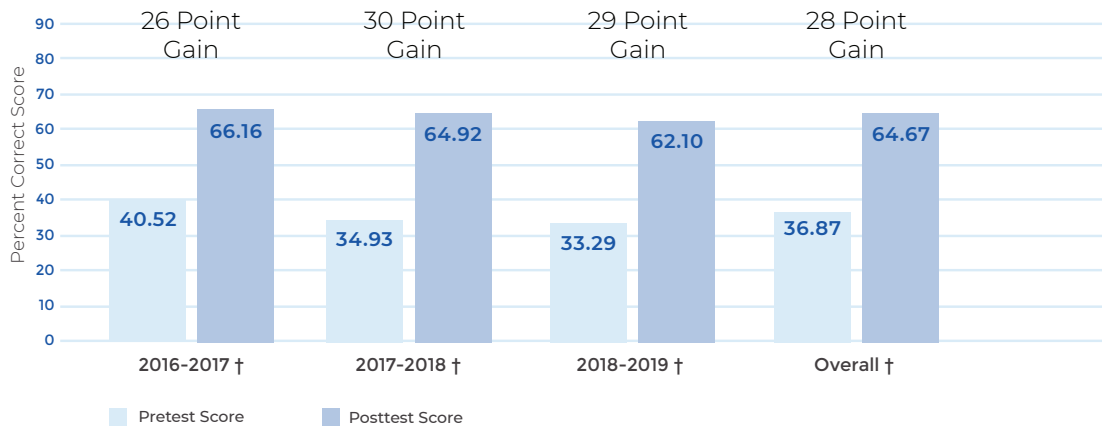
Following the use of ACT® Reading Tutorials:

- Tutorials gains from pretest and posttest score ranged from 26 to 30 points over three years. Relative to pretest performance, the gains are equal to a 63%, 86%, and 87% improvement for 2016-2017, 2017-2018, and 2018-2019 respectively. Over the three-year span, the average gain was 75%.
- The magnitude of the effect of Tutorials use on posttest achievement was large over the three-year period ( $d=.86, 1.05, 1.06$  respectively).

Figure 2 shows average pretest and posttest achievement scores and gain following use of ACT® Reading Tutorials.

**Figure 2**

ACT® Reading: Average Pretest, Posttest, and Percentage Point Gain



†Differences between pre- and posttest for each school year are statistically significant. (Sig.  $p < .001$ ).

Note: The number of modules included in the analysis by school year ranges from 3,338 to 5,178 and overall is 12,078.

### ACT® Mathematics Tutorials

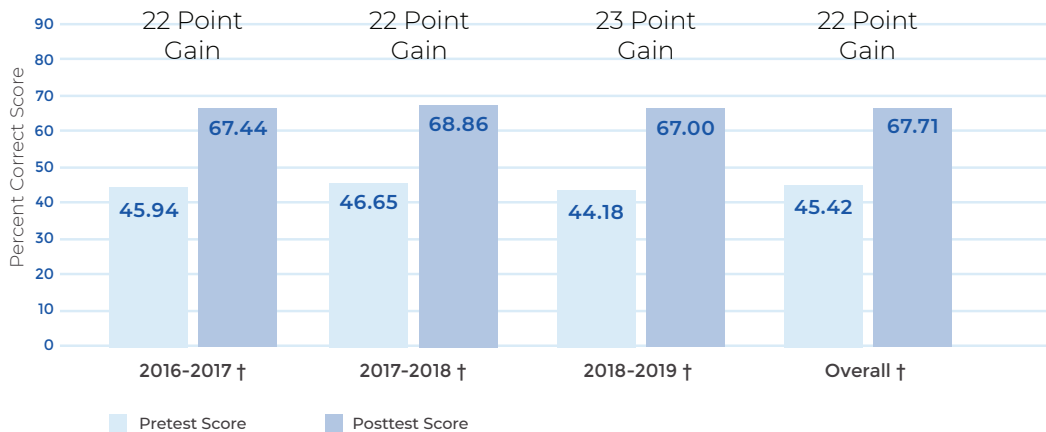
Following the use of ACT® Mathematics Tutorials:

- Tutorials gains from pretest and posttest score ranged from 22 to 23 points over three years. Relative to pretest performance, the gains are equal to a 47%, 48%, and 52% improvement for 2016-2017, 2017-2018, and 2018-2019, respectively. Over the three-year span, the average gain was 49%.
- The magnitude of the effect of Tutorials use on posttest achievement was large over the three-year period ( $d = .80, .83, .86$  respectively).

Figure 3 shows average pretest and posttest achievement scores and gain following use of ACT® Mathematics Tutorials.

**Figure 3**

ACT® Mathematics: Average Pretest, Posttest, and Percentage Point Gain



†Differences between pre- and posttest for each school year are statistically significant. (Sig.  $p < .001$ ).

Note: The number of modules included in the analysis by school year ranges from 3,379 to 5,726 and overall is 13,434.

## Study Description

### Study Design

A pretest/posttest single group design was used to evaluate the impact of Tutorials use on posttest performance.

### Participants

Participants included students from across the nation who used ACT® Tutorials. Student enrollments with completed unit pretests, 100% of unit modules, and unit posttests were included in analytical dataset.

### Data Preparation

Apex Learning provided 145,840 records of student level module data including enrollment ID number, subject, Tutorials name, unit name, module name, and pretest, Test It, and posttest scores. Unit level pretest and posttest scores were distributed across modules by corresponding objectives. Thirty-two percent (32%) of modules containing pretest, Test It, and posttest scores were included in the analytical dataset.

### Analysis

A paired-samples t-test was used to determine if the average module posttest score was significantly greater than the average module pretest score by year for each subject. Cohen's d was used as a measure of effect size.

## Limitations

A single group design was used to analyze the impact of Tutorials use on pretest to posttest gain. Single group design studies are limited by not having a comparison group to control for events unrelated to the intervention that could impact posttest performance. Events unrelated to the intervention include participant maturation, testing, instrument decay, and regression to the mean.

## Outcome Measures

The outcome measure used in this study is the percentage point gain from Tutorials pretest to posttest reported at the module level.

## Appendix

Table 1. Module Level Descriptive Statistics								
ACT® Subject	School Year	Modules	Pretest Score		Test It Score		Posttest Score	
		N	Mean	SD	Mean	SD	Mean	SD
English	2016-2017	6,045	47.08	31.77	77.35	27.02	74.31	30.68
	2017-2018	6,624	39.45	30.37	71.97	29.36	69.12	32.53
	2018-2019	7,790	37.97	28.60	70.55	29.39	65.74	33.23
	Total	20,459	41.14	30.39	73.02	28.84	69.36	32.46
Reading	2016-2017	5,178	40.52	29.69	71.65	30.64	66.16	32.38
	2017-2018	3,562	34.93	28.50	70.54	30.03	64.92	32.34
	2018-2019	3,338	33.29	27.25	68.42	31.06	62.10	33.27
	Total	12,078	36.87	28.86	70.43	30.60	64.67	32.66
Mathematics	2016-2017	3,379	45.94	26.89	69.07	28.55	67.44	29.59
	2017-2018	4,329	46.65	26.67	69.15	28.93	68.86	29.23
	2018-2019	5,726	44.18	26.49	68.12	28.81	67.00	29.37
	Total	13,434	45.42	26.67	68.69	28.78	67.71	29.39

Table 2. Paired-Samples T-Test Results										
ACT® Subject	School Year	Pretest Score Mean	Posttest Score Mean	Paired Differences	Std. Dev.	Std. Error Mean	t	df	Sig. (2-tailed)	Effect Size d
English	2016-2017	47.08	74.31	27.22	37.46	0.48	56.50	6044	0.00†	0.86
	2017-2018	39.45	69.12	29.67	38.84	0.48	62.18	6623	0.00†	0.98
	2018-2019	37.97	65.74	27.76	38.69	0.44	63.33	7789	0.00†	0.97
Reading	2016-2017	40.52	66.16	25.64	37.49	0.52	49.21	5177	0.00†	0.86
	2017-2018	34.93	64.92	29.99	38.32	0.64	46.71	3561	0.00†	1.05
	2018-2019	33.29	62.10	28.80	38.78	0.67	42.91	3337	0.00†	1.06
Mathematics	2016-2017	45.94	67.44	21.50	29.01	0.50	43.08	3378	0.00†	0.80
	2017-2018	46.65	68.86	22.21	28.78	0.44	50.77	4328	0.00†	0.83
	2018-2019	44.18	67.00	22.82	29.41	0.39	58.71	5725	0.00†	0.86
Total	English	41.14	69.36	28.22	38.39	0.27	105.14	20458	0.00†	0.93
	Reading	36.87	64.67	27.80	38.14	0.35	80.10	12077	0.00†	0.96
	Mathematics	45.42	67.71	22.29	29.11	0.25	88.75	13433	0.00†	0.84



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