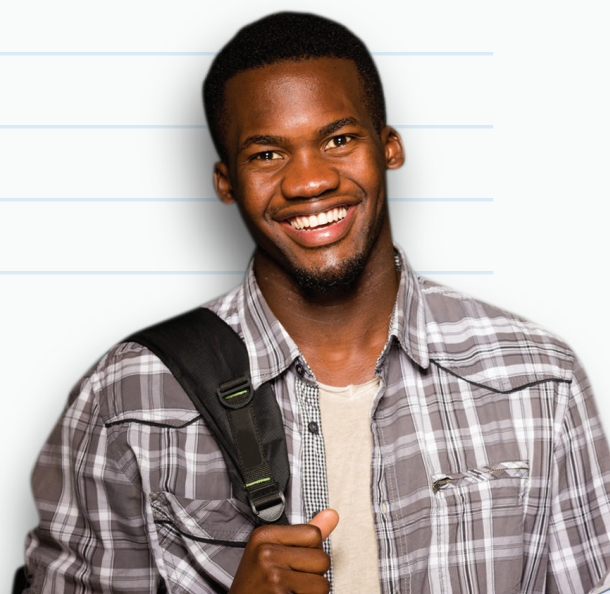
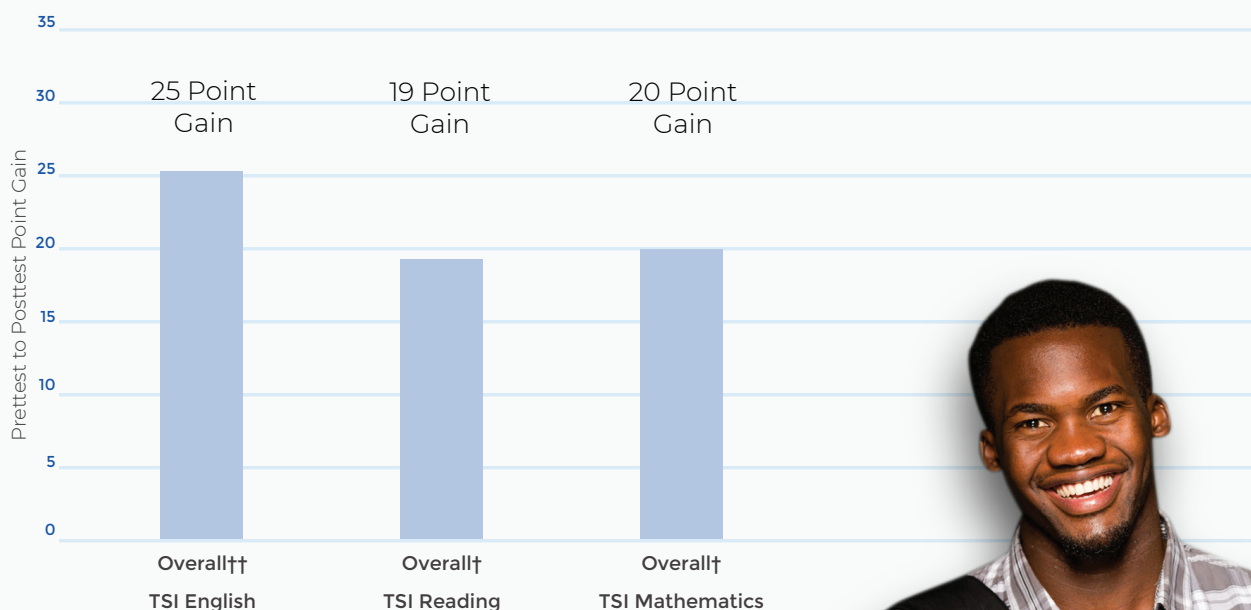




# Three Years of Gain: The Impact of Apex Learning TSI Tutorials on Student Achievement

School Years 2016-2017 through 2018-2019

October 2019



## Introduction: Apex Learning Tutorials

The Texas Success Initiative Assessment (TSI Assessment) ensures students are ready for college-level coursework before they enroll in any college courses. Apex Learning TSI Tutorials were developed to improve student mastery of college-level skills and content established by the Texas College and Career Readiness Standards, while providing seamless support for students who struggle with grade-level content.

TSI Mathematics, Writing, and Reading Tutorials provide targeted instruction, practice, and review. 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. 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 TSI 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 TSI Tutorials on student learning over the course of three school years. The results of 27,904 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 TSI Tutorials significantly improved student performance on Tutorials posttest assessments across reading, writing, and mathematics for three straight years.*

Results of paired-samples t-tests (Table 2, appendix) suggested that TSI 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 reading was 69%, followed by writing at 60%, and mathematics at 42%. The magnitude of the effect varied between moderate to large across subjects and school years.

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

### TSI Reading Tutorials

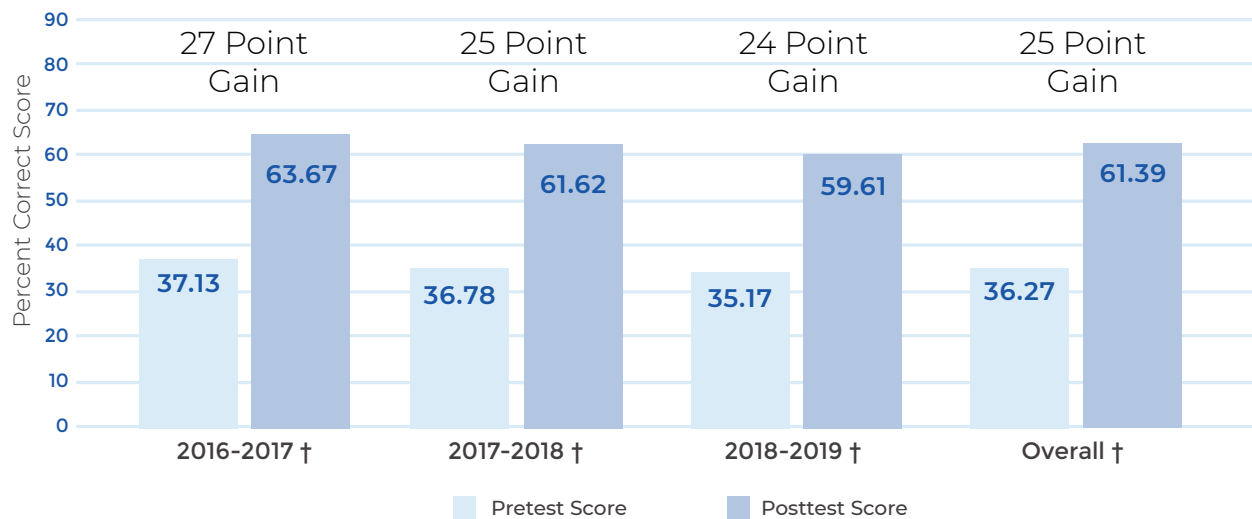
Following the use of TSI Reading Tutorials:

- Tutorials gains from pretest and posttest score ranged from 24 to 27 points over three years. Relative to pretest performance, the gains are equal to a 71%, 68%, and 69% 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 ( $d=.89, .86, .82$  respectively).

Figure 1 shows the average pretest score, posttest score, and gain following use of TSI Reading Tutorials.

**Figure 1**

TSI Reading: 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 3,600 to 5,424 and overall is 14,294.

### TSI Writing Tutorials

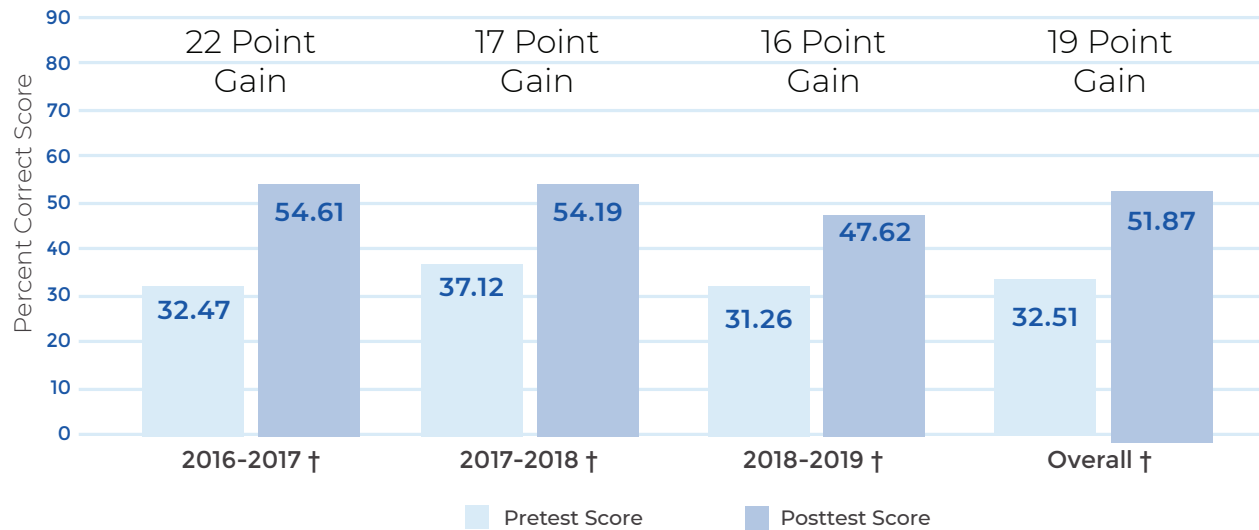
Following the use of TSI Writing Tutorials:

- Tutorials gains from pretest and posttest score ranged from 16 to 22 points over three years. Relative to pretest performance, the gains are equal to a 68%, 46%, and 52% improvement for 2016-2017, 2017-2018, and 2018-2019 respectively. Over the three-year span, the average gain was 60%.
- The magnitude of the effect of Tutorials use on posttest achievement varied between moderate to large over the three-year period ( $d=.82, .61, .58$  respectively).

Figure 2 shows average pretest and posttest achievement scores and gain following use of TSI Writing Tutorials.

**Figure 2**

TSI Writing: 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 502 to 2,315 and overall is 4,591.

### TSI Mathematics Tutorials

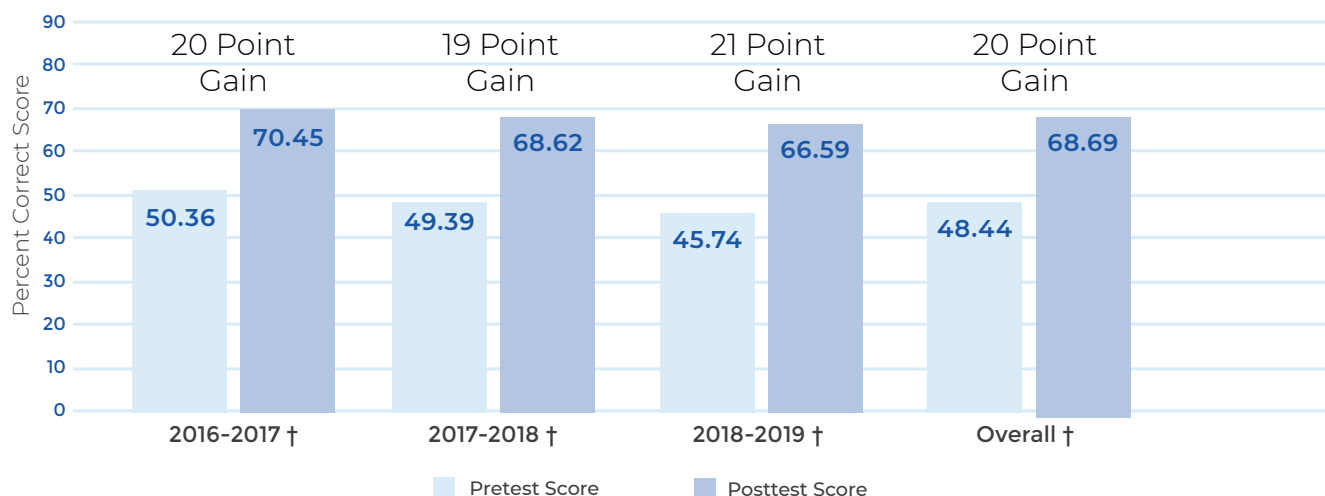
Following the use of TSI Mathematics Tutorials:

- Tutorials gains from pretest and posttest score ranged from 19 to 21 points over three years. Relative to pretest performance, the gains are equal to a 40%, 39%, and 46% improvement for 2016-2017, 2017-2018, and 2018-2019, respectively. Over the three-year span, the average gain was 42%.
- The magnitude of the effect of Tutorials use on posttest achievement was moderate for all three years ( $d = .71, .69,$  and  $.75$  respectively).

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

Figure 3

TSI 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 1,417 to 4,159 and overall is 9,019.

## 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 Texas who used TSI Tutorials. Student enrollments with completed unit pretests, 100% of unit modules, and unit posttests were included in analytical dataset.

### Data Preparation

Apex Learning provided 137,182 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. Twenty percent (20%) 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

TSI Subject	School Year	Modules	Pretest Score		Test It Score		Posttest Score	
		N	Mean	SD	Mean	SD	Mean	SD
Reading	2016-2017	3,600	37.13	29.97	72.20	30.03	63.67	33.04
	2017-2018	5,424	36.78	28.79	71.00	29.68	61.62	32.65
	2018-2019	5,270	35.17	29.67	69.94	30.91	59.61	33.59
	Total	14,294	36.27	29.43	70.91	30.24	61.39	33.14
Writing	2016-2017	2,315	32.47	26.95	60.45	30.19	54.61	32.75
	2017-2018	502	37.12	28.15	61.63	31.90	54.19	33.96
	2018-2019	1,774	31.26	28.08	57.13	30.58	47.62	33.83
	Total	4,591	32.51	27.57	59.30	30.57	51.87	33.47
Mathematics	2016-2017	4,159	50.36	28.32	73.30	27.73	70.45	30.15
	2017-2018	1,417	49.39	27.85	70.78	28.70	68.62	31.13
	2018-2019	3,443	45.74	27.83	66.82	30.52	66.59	31.42
	Total	9,019	48.44	28.14	70.43	29.12	68.69	30.84

Table 2. Paired-Samples T-Test Results										
TSI Subject	School Year	Pretest Score Mean	Posttest Score Mean	Paired Differences	Std. Dev.	Std. Error Mean	t	df	Sig. (2-tailed)	Effect Size d
Reading	2016-2017	37.13	63.67	26.54	39.27	0.65	40.55	3599	0.00†	0.89
	2017-2018	36.78	61.62	24.84	38.90	0.53	47.04	5423	0.00†	0.86
	2018-2019	35.17	59.61	24.44	40.04	0.55	44.31	5269	0.00†	0.82
Writing	2016-2017	32.47	54.61	22.14	38.66	0.80	27.56	2314	0.00†	0.82
	2017-2018	37.12	54.19	17.07	37.38	1.67	10.23	501	0.00†	0.61
	2018-2019	31.26	47.62	16.36	41.13	0.98	16.75	1773	0.00†	0.58
Mathematics	2016-2017	50.36	70.45	20.09	29.84	0.46	43.42	4158	0.00†	0.71
	2017-2018	49.39	68.62	19.23	29.89	0.79	24.21	1416	0.00†	0.69
	2018-2019	45.74	66.59	20.85	30.88	0.53	39.61	3442	0.00†	0.75
Total	Reading	36.27	61.39	25.12	39.42	0.33	76.19	14293	0.00†	0.85
	Writing	32.51	51.87	19.35	39.59	0.58	33.12	4590	0.00†	0.70
	Mathematics	48.44	68.69	20.24	30.25	0.32	63.55	9018	0.00†	0.72

† Statistically significant,  $p < .05$



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