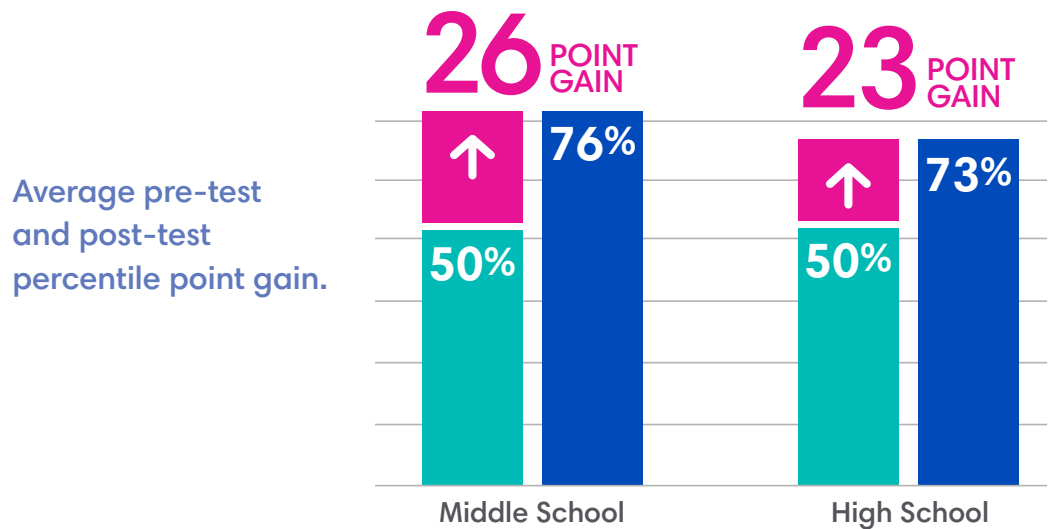# A Study of the Impact of Adaptive Tutorials on Middle and High School Student Achievement

School Year 2016–2017

December 2017

Average pre-test and post-test percentile point gain.

26 POINT GAIN

↑

76%

50%

Middle School

23 POINT GAIN

↑

73%

50%

High School

Introduction

The purpose of this study is to investigate the impact of Apex Learning middle and high school Tutorials on student learning during the 2016–2017 school year. The analysis addresses the question: "What impact does Tutorials use make on achievement gains from pretest to posttest?"

The results of 408,685 modules with pretests, Test It, and posttest scores across Tutorials were evaluated to determine if posttest achievement was significantly greater than pretest performance. Paired-samples *t*-tests were used to evaluate the data for middle and high school Tutorials separately.

Descriptive statistics and statistical results are located in the appendix.

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Findings

Adaptive Tutorials improved student performance on posttest assessments.

Results of paired-samples *t*-tests (Table 2) suggest that Tutorials had a statistically significant impact on middle and high school student posttest achievement compared to pretest performance.

Students using middle school Tutorials gained an average of 26 percentile points compared to pre-test performance and high school students gained an average of 23 percentile points. Figure 1 shows pre-test and post-test percentile scores and percentile point gain.

FIGURE 1:

Average Percentile Score Gain
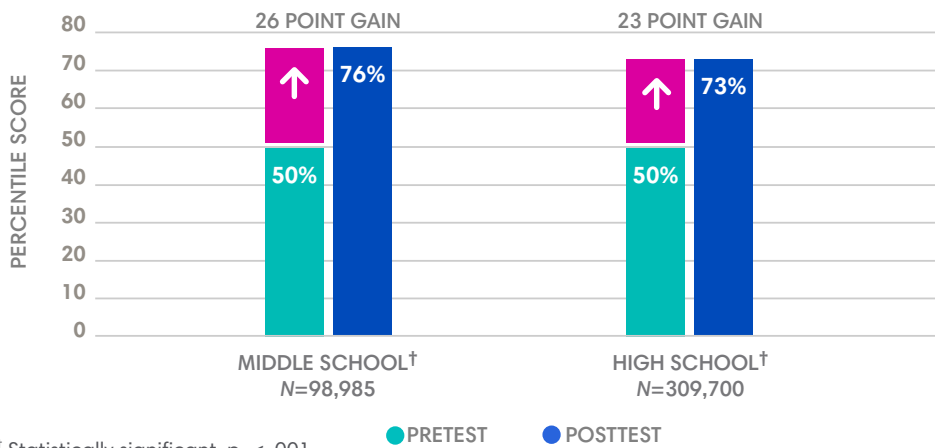
† Statistically significant, p. < .001
N = number of modules included in the analysis

Figure 2 shows pre-test and post-test percentile scores and percentile point gains across all four subjects. In the 2016-2017 school year, middle school science and social studies Tutorials were not yet available.

Figure 2:

Average Percentile Score Gain by Subject

† All comparions are tatistically significant, p. < .001

⬤ Middle School ⬤ High School
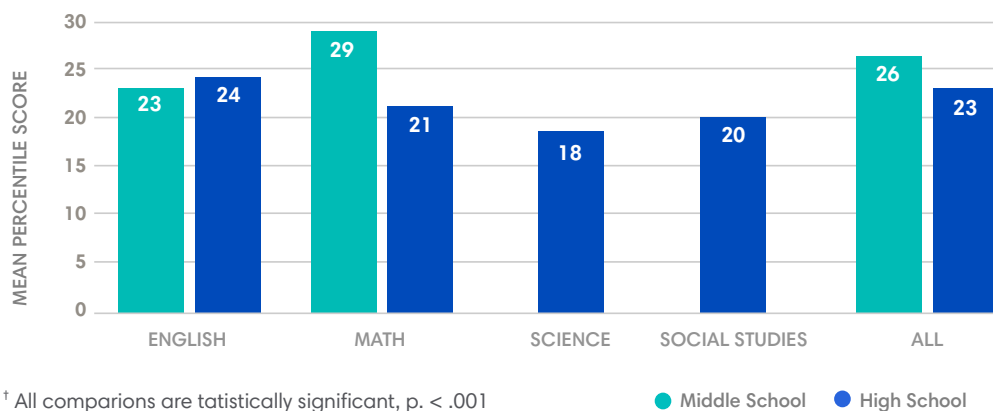
Apex Learning: Adaptive Tutorials

Adaptive Tutorials prepare students to master grade-level content with standards-based instruction, while providing seamless support for students who struggle with grade-level content. Instruction is delivered in discrete modules addressing specific concepts, and modules are grouped into units of related concepts. Students may complete only those modules that address a particular standard or standards, or complete all modules in a Tutorial.

Tutorials provide a personalized learning path for each student. Unit-level pretests prescribe a plan of instruction to meet students' individual learning needs, and students struggling with grade-level concepts are prescribed remedial instruction of skills down to the third-grade level. The learning path continually adapts as students progress through each module.

Embedded pretest, Test It, and posttest assessments provide performance data by module, unit, or standard, quickly identifying where students have demonstrated content mastery and where they still need to focus their learning.

Study Description

Study Design

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

Participants

During the 2016–2017 school year, students from across the nation used over a half-million middle and high school Tutorials modules. Student enrollments with completed unit pretests, 100% unit modules, and unit posttest were included in analytical dataset.

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Data Preparation

Apex Learning provided 566,629 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. Seventy-two percent (72%) 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. 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 intervention include participant maturation, testing, instrument decay, and regression to the mean.

Outcome Measures

The outcome measure used in this study is the Tutorials posttest score reported at the module level.

Appendix

Table 1. Module Level Descriptive Statistics								
		Modules	Pre-test		Test It		Post-test	
	Subject	*N*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Middle School	English	46,312	39.85	29.33	70.98	33.06	59.52	34.07
	Math	52,673	42.16	27.71	71.54	29.20	66.90	31.07
Total		98,985	41.08	28.50	71.28	31.07	63.45	32.71
High School	English	240,838	38.68	28.78	68.41	33.46	59.93	34.50
	Math	30,488	37.77	25.77	60.76	30.09	53.90	31.18
	Science	20,779	35.71	25.61	56.89	30.67	49.22	30.06
	Social Studies	17,595	39.18	25.33	62.95	30.45	54.19	30.43
Total		309,700	38.42	28.12	66.57	32.99	58.29	33.84

Table 2. Paired-Samples T-Tests						
	Subject	Difference *M*	*df*	*t*	*Sig. p*	ES
Middle School	English	19.66	46,311	106.08	0.00 †	0.62
	Math	24.75	52,672	174.03	0.00 †	0.84
Total		22.37	98,984	193.88	0.00 †	0.73
High School	English	21.24	240,837	257.97	0.00 †	0.67
	Math	16.13	30,487	84.37	0.00 †	0.57
	Science	13.51	20,778	58.76	0.00 †	0.49
	Social Studies	15.02	17,594	59.65	0.00 †	0.54
Total		19.87	309,699	283.25	0.00 †	0.64

† Statistically significant, p. < .001

More Learning Happens

Apex Learning puts rigorous, standards-based curriculum within reach for all students — from those struggling to those capable of acceleration — to prepare them for the next course, the next stage in their education, work, and life. Schools use Apex Learning digital curriculum because it is proven that more learning happens with the powerful, actionable data that gives educators insight into student performance, and the personalization and engagement students need to succeed. During the 2016–2017 school year, there were more than three and a half million enrollments in Apex Learning Comprehensive Courses for original credit and credit recovery, and Adaptive Tutorials for intervention, remediation, and to prepare for high-stakes assessments. Headquartered in Seattle, Apex Learning is accredited by AdvancEd, and its courses are approved for National Collegiate Athletic Association eligibility.

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