![Apex Learning®]

A Study of the Impact of Apex Learning Digital Curriculum on Original Credit Student Achievement

Dallas Independent School District

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Introduction

One high school in the Dallas Independent School District (Dallas ISD), referred to as OHS to maintain confidentiality, uses Apex Learning digital curriculum to personalize learning and enhance classroom instruction for original credit students. This study examines the impact of using Apex Learning digital curriculum in two distinct original credit implementations at OHS during the 2014–2015 school year.

The first program was a Blended Learning Pilot in one English III classroom. Teachers used Apex Learning Comprehensive Courses in a year-long Blended Learning Pilot designed to personalize learning for original credit students by enhancing traditional instruction with digital curriculum content. Students enrolled in the Blended Learning Pilot classroom used Comprehensive Courses throughout the entire school year and completed the ACP English III fall and spring semester exams.

The second program was a Test Preparation Program. OHS used Apex Learning Texas-specific Tutorials to support original credit students enrolled in Algebra II. Students enrolled in Algebra II used Texas Algebra II Tutorials throughout the second semester to deepen content mastery and prepare for the Dallas ISD Assessment of Course Performance (ACP) Algebra II spring semester exam.

A separate investigation was conducted for each program. For the Blended Learning Pilot, the achievement of students using Comprehensive Courses was compared to students who did not use Apex Learning Comprehensive Courses on the ACP English III fall and spring exams. For the Test Preparation Program, Algebra II spring achievement after using Tutorials was compared to fall achievement before using Tutorials on the ACP end-of-semester exams.

Eighty-three (83) students were included in the study. The majority of students using Apex Learning digital curriculum included in this study were:

- Were eligible for free and/or reduced lunch (57%)
- Include students who were limited English proficient (19%)
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Tables 1 and 2, located in the appendix, provide detailed demographic characteristics of students included in the study. Tables 3 and 4 show average usage statistics for Apex Learning Comprehensive Courses (Blended Learning Pilot) and Texas Tutorials (Test Preparation Program).
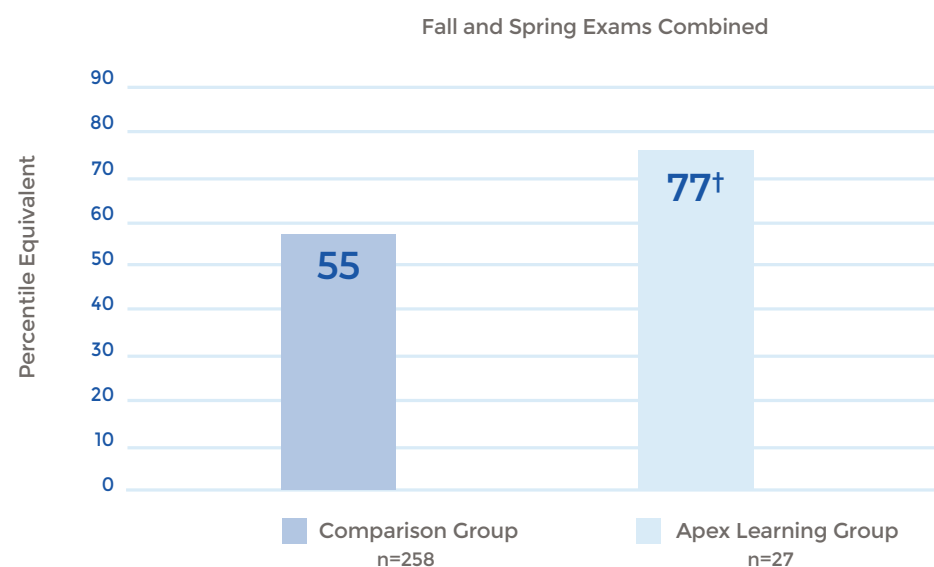
Results

Do students who use Apex Learning Comprehensive Courses in addition to traditional classroom instruction (blended learning) perform the same as or better on end-of-semester exams than students in traditional classrooms not using Apex Learning digital curriculum?

Students using Apex Learning Comprehensive Courses in the Blended Learning English III classroom performed significantly better on ACP exams than students enrolled in the English III classes not using Apex Learning Courses (Appendix, Table 6). Figure 1 shows for English III ACP fall and spring exams combined, the average score on end-of-semester exams for students using Apex Learning Courses is equivalent to 22 percentile points greater than students not using Apex Learning Courses.

Do original credit students who use Tutorials in addition to classroom instruction perform the same or better than before using Tutorials on end-of-semester exams?

After using Tutorials, the average Algebra II performance of original credit students on the spring end-of-semester exam improved significantly from the fall end-of-semester exam (Appendix, Table 5). The average score on the spring exam is equivalent to 9 percentile points greater after using Tutorials than the average fall exam, administered before using Tutorials (ES=.24, p<.01). Figure 2 shows the average scores on the ACP Algebra II semester exams before and after using Tutorials.

Figure 1:

Average[1] ACP English lll Standarized Scores by Group: Blended Learning Pilot

Fall and Spring Exams Combined

Comparison Group: 55, n=258
Apex Learning Group: 77[†], n=27

†Statistically significant. Sig. p<0.1, ES=.53

[1]Means adjusted for the following covariates: age, grade, gender, minority, limited English proficiency, special education and talented and gifted status, economic disadvantage, at-risk status, HIPPY participation, last year retention, and semester exam.

Figure 2:

Average ACP Algebra II Standarized Scores Before and After Using Tutorials: Test Preparation Program
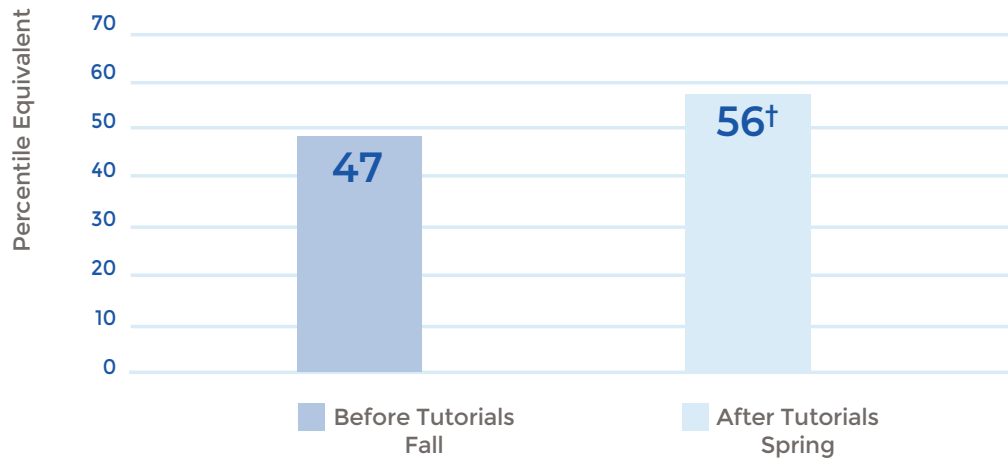
†Statistically significant. Sig. p<0.1, ES=.24, n=69

Study Description

Study Design

Study Design Two designs were used to conduct this investigation. The Blended Learning Pilot analysis employed a posttest only quasi-experimental study design. The Test Preparation analysis used a pretest posttest single group design. The number of students enrolled in Algebra II at OHS who did not use Tutorials (9 students) was not sufficient to use.

Participants

Students included in the study, Apex Learning and comparison groups were not participating in the district Reconnect Center Program designed to support students in need of credit recovery. Tables 1 and 2 in the appendix show the demographic characteristics of students included in the study.

Data Preparation

Three steps were completed to create the final analytical dataset. The steps included:

1. Identifying original credit students using Apex Learning for the school-based Blended Learning Pilot and Test Preparation Programs

2. Joining the Dallas ISD and Apex Learning data files

3. Identifying a comparison group of students enrolled in the same English lll course as the students participating in the Blended Learning Pilot

Joining the files

Dallas ISD provided three files (Fall ACP, Spring ACP, and STAAR-EOC) containing a total of 7,606 records from students enrolled in Grades 9-12 at OHS. The Fall ACP and Spring ACP files contained the results from the respective end-of-semester exam. The STAAR-EOC file contained the last score recorded for an assessment taken during any administration conducted during the 2014–2015 school year. Individual subject assessments were pooled by test name and the scaled scores were transformed into standardized z-scores to allow comparisons to be made across assessments and across studies.

In addition to test scores, each file contained demographic and academic variables for students completing an assessment. Demographic variables included: date of birth, grade, gender, race, limited English proficiency, special education flag, talented and gifted flag, economic disadvantage indicator, at-risk flag, HIPPY participation flag, and last year retention indicator. Academic variables provided in the ACP files included: ACP course number; ACP test name; and raw, scaled, and exam scores. Academic variables provided in the STAAR-EOC file included: first time test taker/retake indicator, test name, version (standard, language accommodated, etc), scaled score, and performance standard.

Apex Learning provided a file containing records for 838 Comprehensive Course enrollments and 420 Tutorial enrollments that used Apex Learning between summer 2014 and spring 2015. The Apex Learning files included variables for school, program name, classroom name, course or Tutorial title, first access date, last access date, number and percent of course activities or tutorial modules completed, total session minutes, and quality of work metrics. Of the 838 Comprehensive Course enrollments, 32 were identified as participating in the Blended Learning Pilot by the school site coordinator in the spring of 2015. Seventy-one (71) Tutorial enrollments were identified as participating in the Algebra ll Test Preparation Program.

Enrollment records from the Apex Learning file were joined to the assessment records from the District files. Eighty-four percent (27 out of 32) of enrollments using Courses for Blended Learning had ACP fall and/or spring scores. Ninety-seven percent (69 out of 71) of enrollments had ACP Algebra II fall and spring exam scores.

Generating a Comparison Group

For the Blended Learning analyses, the comparison group included all students who were enrolled in the same English III course number and completed the same tests as students using Apex Learning Comprehensive Courses. Students in the comparison group did not use Apex Learning digital curriculum.

For the Test Preparation analyses, a comparison group was not used.

Analysis

For the Blended Learning Pilot investigation, an analysis of covariance was used to compare the average standardized scale score of students using Apex Learning Comprehensive Courses to the average standardized scale score of students in the comparison group who did not use Apex Learning digital curriculum. Covariates were used to equate group demographic characteristics including: race/ethnicity, gender, limited English Proficiency status, economic disadvantage, Special Education participation, gifted and talented program participation, grade, date of birth and other program variables provided by the school district (at-risk indicator, HIPPY participation, and retained last year indicator).

For the Test Preparation Program analysis, a paired t-test was conducted to compare the average ACP Algebra ll standardized scale score before and after using Apex Learning Tutorials.

Limitations

The results of this study are limited to original credit students participating in the Blended Learning Pilot and Test Preparation Program implemented in one high school within the Dallas ISD.

Outcome Measure

This study examines the impact of using Apex Learning digital curriculum on local assessments administered during the 2014–2015 school year. The Dallas ISD, Assessment of Course Performance (ACP) exams are standardized final semester tests that measure the taught curriculum in Mathematics, Reading/Language Arts, Science, Social Studies, English as a Second Language (ESL), World Languages, Technology, Health and Fine Arts courses. ACP exams were administered at the end of the fall and spring semesters. The standard for passing is a scaled score of 70 or above. Scaled scores from each exam accounted for 15% of the final semester grade in high school.

References

Williams-Palmer, K. & Kim, J. (no date). Assessment of Course Performance (ACP): 2014-15. Retrieved from http://www.dallasisd.org/cms/lib/TX01001475/Centricity/domain/98/assessment/sna/EA15-220-4%20ACP%20AAG.pdf on 3/31/16.

Appendix

Table 1. Apex Learning Users vs. Comparison Groups: Blended Learning Pilot					
	Comparison		Apex Learning		Total
Demographic Characteristics	N	%	N	%	N
Total Enrollments	258	100.0%	27	100.0%	285
9th Grade	0	0.0%	0	0.0%	0
10th Grade	20	7.8%	4	14.8%	24
11th Grade	237	91.9%	22	81.5%	259
12th Grade	1	0.4%	1	3.7%	2
Female	138	53.5%	14	51.9%	152
Male	120	46.5%	13	48.1%	133
Asian	4	1.6%	0	0.0%	4
Black or African American	52	20.2%	6	22.2%	58
Hispanic/Latino	198	76.7%	20	74.1%	218
American Indian or Alaska Native	2	0.8%	0	0.0%	2
White	2	0.8%	1	3.7%	3
Multi-racial	0	0.0%	0	0.0%	0
LEP-Yes	12	4.7%	1	3.7%	13
Special Education-Yes	16	6.2%	0	0.0%	16
Economically Disadvantaged	224	86.8%	18	66.7%	242
At Risk-Yes	207	80.2%	18	66.7%	225
Not retained last year	237	91.9%	22	81.5%	259
Retained last year	11	4.3%	1	3.7%	12
Retention last year unknown	10	3.9%	4	14.8%	14
Parent of preschooler (HIPPY)-Yes	14	5.4%	1	3.7%	15
English lll ACP Results †	N	Mean	N	Mean	N
Fall ACP Scale Score	134	73.03	16	75.09	150
Fall ACP Exam Grade	134	73.04	16	75.13	150
Fall ACP Z-Score	134	0.21	16	0.50	150
Spring ACP Scale Score	124	70.82	11	80.72	135
Spring ACP Exam Grade	124	70.82	11	80.64	135
Spring ACP Z-Score	124	0.05	11	7.09	135

† Unadjusted scores.

Table 2. Apex Learning Tutorial Users: Test Preparation Program

Demographic Characteristics	N	%
Total Enrollments	71	100%
10th Grade	7	9.9%
11th Grade	64	90.1%
Female	40	56%
Male	31	44%
Asian	0	0%
Black or African American	11	15%
Hispanic/Latino	58	82%
American Indian or Alaska Native	2	1%
White	1	1%
Multi-racial	1	1%
LEP-Yes	11	15%
Special Education-Yes	2	3%
Economically Disadvantaged-Yes	56	79%
At Risk-Yes	48	68%
Not retained last year	66	93%
Retained last year	2	3%
Retention last year unknown	3	4%
Parent of preschooler (HIPPY)-Yes	2	3%
Algebra ll ACP Semester Exam Results †	**N**	**Mean**
Fall ACP Scale Score	69	72.43
Fall ACP Exam Grade	69	72.41
Fall ACP Z-Score	69	-0.07
Spring ACP Scale Score	71	73.67
Spring ACP Exam Grade	71	73.67
Spring ACP Z-Score	71	0.14

† Unadjusted scores.

Table 3. Apex Learning Comprehensive Course Usage by Assessment: Blended Learning Pilot

			Total Minutes	Total Hours	Percent of Activities Completed	Quality of Work
Comprehensive Course	ACP Assessment	N	Mean	Mean	Mean	Mean
English lll Prescriptive (2013)	English lll SEM 1	16	1947	32.45	22.75%	78.56
English lll Core (2013) SEM 2	English lll SEM 2	11	1496	24.93	24.93%	80.35

Table 4. Apex Learning Tutorials Usage by Assessment: Test Preparation

Tutorial	ACP Assessment	N	Total Minutes Mean	Percent of Modules Completed Mean	Number of Assessments Attempted Mean	Quality of Work Mean
Algebra II Texas (2014)	Algebra II SEM 2	43	84	8.58%	5.37	61.93
	Algebra II Pre-SEM 2	28	65	5.61%	3.54	58.89
	Assessments Combined	71	76	7.41%	4.65	60.73

Table 5. Paired Mean Difference: Algebra II ACP End-of-Semester Exam

Tutorial	N	Mean Z-Score	Percentile Equivalent	SD	t	Sig. (2-tailed)
Spring (After Tutorial Use)	69	0.16	56	0.96		
Fall (Before Tutorial Use)	69	-0.07	47	0.98		
Paired Difference	69	.23		0.72	2.70	0.01

Table 6. Parameters Estimates: English III ACP End-of-Semester Exams

Dependent Variables: English III ACP Z-Score

Parameter	B	Std. Error	t	Sig.
Incept	-55.19	37.81	-1.46	0.15
Control Group	-0.53	0.19	-2.76	0.01
Apex Learning	0a	.	.	.
Male Flag	-0.27	0.11	-2.51	0.01
LEP Flag	-0.53	0.28	-1.89	0.06
Minority Flag	-0.53	0.53	-1.01	0.32
Grade 9	0a	.	.	.
Grade 10	-0.01	0.74	-0.01	0.99
Grade 11	0.15	0.72	0.21	0.83
DOB	0.00	0.00	1.50	0.14
Economic Disadvantage Flag	0.04	0.18	0.20	0.84
At-risk Flag	-0.61	0.14	-4.42	0.00
Special Education Flag	0.11	0.24	0.44	0.66
Gifted Flag	0.25	0.18	1.40	0.16
Retained Last Year Flag	-0.22	0.16	-1.40	0.16
ACP Fall Test_1	0.13	0.11	1.21	0.23
ACP Spring Test_2	0a	.	.	.

a This parameter is set to zero because it is redundant.
b Computed using alpha=.05

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