MDE / MS Legislature - Jumpstart Test Prep Pilot Schools
2021 ACT Score Change Analysis

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Purpose and Scope

Jumpstart Test Prep has concluded the 2020 – 2021 school year implementation of a legislatively funded test prep program for juniors who prepared for the state mandated ACT® exam administered during the spring of 2021. This report will provide an analysis on the effectiveness of implementation of the Jumpstart Test Prep complete ACT review in improving ACT exam scores across a number of Mississippi public high schools during the 2020-2021 academic year. Implications for subject level and overall exam performance will be investigated. Results will be generated at the aggregate school level and differences will also be considered among students by factors such as ethnicity and gender.

Random Selection

The data analyzed herein are from the 2021 ACT exam testing at 31 Mississippi Public High Schools. These 31 schools were selected for inclusion in the pilot program based on a random selection process among all public schools in Mississippi that applied for funding and inclusion in the program. The pilot program was funded through a $175,000 allocation from the Mississippi Legislature and supported approximately 4,100 juniors in improving their ACT test scores during the 2020-2021 school year.

Working in conjunction with the Mississippi Department of Education (MDE), through the Office of Secondary Education, the goal of the 2020-2021 Mississippi legislative pilot was to assist teachers at the selected high schools with improving ACT composite English sub-score averages, as well as gain feedback and improvement results from schools awarded the review course pilot.

Randomized selection from 109 applying Mississippi Public High Schools was completed in the fall of 2020, and 31 selected schools were announced by MDE on October 13, 2020.

Program Implementation Design

Selected schools were tasked to complete the 8-module Jumpstart Test Prep ACT English Review in the classroom beginning not more than 4-weeks from the planned ACT mandated junior test date of February 23, 2021. Online access credentials were provided to all teachers designated to proctor the Jumpstart Review. Credentials were also provided to each junior student.

Teachers were instructed to utilize Jumpstart's instructional strategies and provided differentiated instruction utilizing the Jumpstart video review modules while students completed consumable workbooks by building flashcards and completing timed challenge questions.

Following review completion, each student received one (1) attempt of the Jumpstart English assessment designed to uncover weaknesses in the MS College and Career Readiness standards and provide an individualized review specific to the deficits of students. Remaining review time prior to test day was recommended to involve individual review of assessment uncovered deficits.

Ten pilot schools elected to also provide other review subject areas as described herein.

Implementation Milestones

- November 2020 - All faculty orientation and planning sessions were completed at the 31 pilot schools.
- December 2020 – Student workbook delivery completed for all schools.
- December 2020 – Individual parent letters were supplied to each school to inform parents of the program.
- December 2020 – Individual actual prior-ACT scores were supplied by each school to be used for post review improvement analysis. In the case of a student having multiple prior ACT attempts, the best prior score was used.
- January 2021 – School contests were announced at each school with posters provided to encourage student engagement in the review program.
- February 2021 - The Jumpstart ACT English review classes began at all selected Mississippi high schools with a few weeks remaining until the scheduled test day.

Implementation Setbacks

Implementation was substantially impacted by numerous extraneous factors. Notably, several pilot schools experienced COVID interruptions during the January / February implementation period that did not allow for the completion of the review in the classroom for all students. Mississippi also experienced an unprecedented ice storm and weeklong school closures eliminating the critical six calendar school days immediately prior to test date. As a result, some schools were unable to complete the entire review as prescribed. Eight schools retained the scheduled ACT testing date of February 23rd, while eighteen schools delayed the ACT testing date until March 23rd or 30th. Several of these schools were able to continue the review during March, however, spring break eliminated review immediately prior to testing. Four schools delayed testing until April 6th or 13th and were subsequently removed from the study due to no review being completed in the weeks immediately prior to testing.

Analyzable Sample Details

Due to these various societal disruptions (i.e., the COVID pandemic and severe weather outbreaks), as well as school level idiosyncrasies, 12 schools failed to properly implement their programs and were disqualified from inclusion in our assessment (reason codes are provided by school accordingly). Another school (Brookhaven) implemented most of its program, but abandoned instruction of one of four subjects (Science).

Reason Code Key for Table 1:
1. No classroom instruction component provided by teacher(s).
2. Limited classroom instruction component provided by teacher(s).
3. Mistimed classroom instruction component provided by teacher(s) relative to test date.
4. No assessment usage by students.
5. Limited assessment usage by students.
6. Ice storm.
7. COVID.
8. No ACT post- scores returned.

School	Students	Subjects	Disqualified	Reason Codes
Brookhaven HS	198	All	Science	6
Coahoma County HS	65	English	All	1, 4, 7, 8
D'Iberville HS	293	English	None	N/A
East Marion HS	54	All	All	2, 4
East Webster HS	70	All	None	N/A
Grenada HS	203	English	None	N/A
Horn Lake HS	353	English	None	N/A
Houlka AC	29	English	All	4, 7, 8
Houston HS	121	English	All	4
Humphreys County HS	2	English	All	4
Jefferson County HS	70	All	None	N/A
Kemper County HS	81	All	All	3, 5
Lawrence County HS	126	English/Math	None	N/A
Leland HS	49	All	None	N/A
Loyd Star AC	40	All	None	N/A
Magee HS	94	All	All	2, 4
Mendenhall HS	132	All	All	2, 5
Mize AC	65	All	None	N/A
Nettleton HS	98	English	None	N/A
Newton County HS	114	English	None	N/A
Olive Branch HS	299	English	All	3, 6
Pass Christian HS	149	English	None	N/A
Petal HS	224	English	None	N/A
Ripley HS	107	English	None	N/A
Senatobia HS	135	English	All	3, 8
Stone HS	153	English	None	N/A
Strayhorn HS	62	English	All	4, 6, 7, 8
Tylertown HS	59	English	None	N/A
West Lauderdale HS	144	English	None	N/A
Wilkinson County HS	80	English	All	4, 8
Yazoo County HS	104	English	None	N/A

Table 1. Overview of Schools Utilizing Jumpstart during AY 2020-2021

While 3,773 students were included across 31 schools in our pilot study, the implementation challenges reduced our analyzable sample to 2,619 students across 19 schools. February ACT Scores achieved following the Jumpstart implementation are compared against actual ACT prior attempts for all students with at least 1 prior attempt. In the case of multiple prior attempts, the best prior attempt was used for comparison.

Scores achieved at the state administered testing date in February 2021 are compared against pre-tests conducted as part of the preparation process. Across the 19 qualified schools in the Pilot, there were a total of 2,619 eligible students. All of these students were provided course materials to be completed as prescribed in the classroom or individually as directed by the school.

All 19 schools have reported pre- and post- ACT data for some of their students. February ACT (post-exam) data was provided for 2,135 (of 2,619) students (81.52%). Post- exam scores for students with pre- scores were unavailable and not reported if the student was absent on test day, withdrew or moved from the district between exams.

As the Jumpstart ACT Math review was procured additionally by 7 of the 19 analyzable pilot schools, 618 students received Math area JTP, of which 422 students tested on the state-wide date and 141 students had a previous exam attempt as well (with an associated subject area score report).

All 19 pilot schools (representing 2,619 students) received the Jumpstart ACT English prep. Among students that received English area JTP, 2,138 students tested on the state-wide date and 910 students had a previous exam attempt as well (with an associated subject area score report).

As the Jumpstart ACT Science review was procured additionally by 5 of the 19 analyzable pilot schools, 294 students received Science area JTP, of which 267 students tested on the state-wide date and 74 students had a previous exam attempt (with an associated subject area score report).

As the Jumpstart ACT Reading review was procured additionally by 6 of the 19 analyzable pilot schools, 492 students received Reading area JTP, of which 303 students tested on the state-wide date and 110 students had a previous exam attempt (with an associated subject area score report).

Out of the 19 analyzable pilot schools, a total of 5 schools had acquired and successfully implemented Jumpstart ACT test prep across all 4 subject areas (English, Math, Science, Reading). 294 students were represented by these 5 schools, of which 266 students tested on the state-wide test date and 74 students had a previous exam attempt. Composite ACT score changes will be assessed for these students given comprehensive access to Jumpstart ACT test prep.

Testing the difference between the post- and pre- exam scores at the subject and composite levels is a highly attractive approach to assessing the success of the Jumpstart Test Prep program. While the change in scores before and after use of the program brings natural intuitive appeal as a simple metric of the program's effectiveness, there is also significant scientific merit to this approach. Differencing a student's individual pre- and post- score effectively allows the student specific factors to be cancelled out (as they are present in both measurements). Thus, confounding factors such as student aptitude, home situation, family income, etc. are all effectively controlled for with this analysis approach[1].

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[1] One must concede, however, that *changes in these factors that align with the timeframe between the pre- and post- score measurements* are not accounted for. As an example, a student that had a stable home environment at time of the pre- exam scoring, but has since experienced a significant family disruption near the post- exam scoring date may see his/her exam score suffer: the analysis cannot account for such drivers of score change given the current data. However, these anomalies should be fairly unlikely and are expected to be *randomly distributed among the student sample*: thus, it is just as likely that a student experiences a positive change versus a negative change during the treatment period. When assessing program performance at a sample level (i.e., the whole school), these time dynamic effects within student are expected to effectively cancel out.

Experimental Design

To assess program effectiveness (that the test prep will lead to score growth at the individual student level), a field study is designed in the form of a one-group pretest-posttest, which takes the following form:

Mississippi Public HS Test Takers: O_1 X O_2 …where:

O_1 = 2021 pre-test scores at Mississippi Public High Schools (in the case of multiple prior attempts, the best prior attempt score was used)
X = Utilization of Jumpstart Test Prep
O_2 = 2021 administered date test scores at Mississippi Public High Schools

To empirically assess performance improvement, O_1 will be subtracted from O_2. This score change will then be statistically compared against a null expectation of no score growth (zero) using a one-tailed t-test. A p-value of less than .05 is considered statistically significant (indicating measurable student improvement is present), while a p-value .05 or larger, but less than .10, is considered to be marginally significant (meaning that improvement is likely present, but without full conclusion confidence).

Exploratory Results

An exploratory set of analyses are overviewed first by subject area, before proceeding to the more formal statistical tests. The percentage of students improved by subject area is examined next. This is calculated by including all students who had both a pre-test (before the use of the Jumpstart Test Prep program) and a post-test score (after using the test prep), from which potential improvements could be measured and attributed to the program. These results are presented next (in Figure 1). Appendix 2 at the back of this document provides the percentage of students improved by subject, disaggregated in more detail by each school.

% of Students Improved, By Subject Area

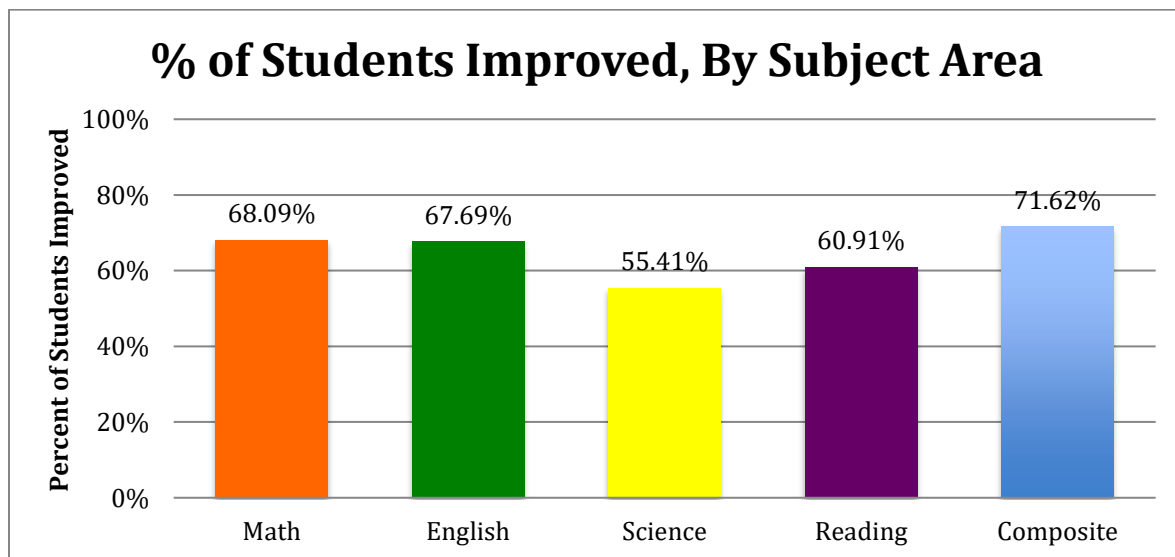| Subject	Percent
Math	68.09%
English	67.69%
Science	55.41%
Reading	60.91%
Composite	71.62%

Figure 1. Percent of Students Improved, by Subject Area

Figure 2 (below) provides the average number of points improved observed among the group of students who did improve upon their best prior test score with the assistance of Jumpstart Test Prep. Note that Appendix 3 at the back of this document provides the average score improvement by subject, isolated by each school.
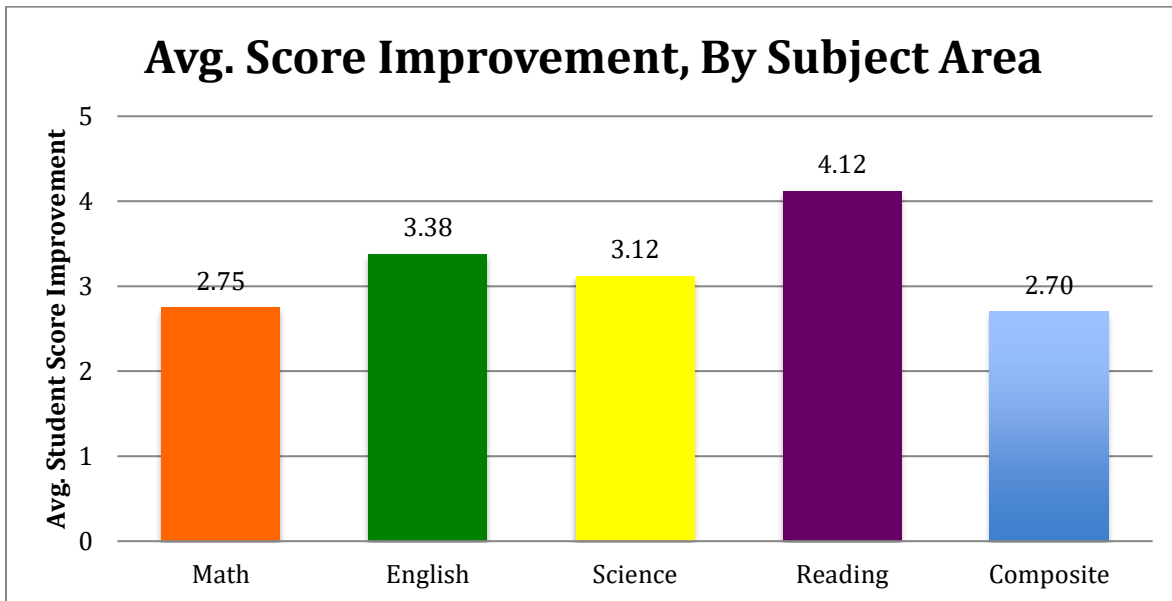

Figure 2. Average Rate of Improvement, Among Those Students Who Showed Improvement

The distribution of score improvements between the pre- and post- scores for the Math subject area is provided in Figure 3 (below). In total, 68.09% of students showed improvement, for an average gain of 2.75 points. The maximum score gain was 9 points.
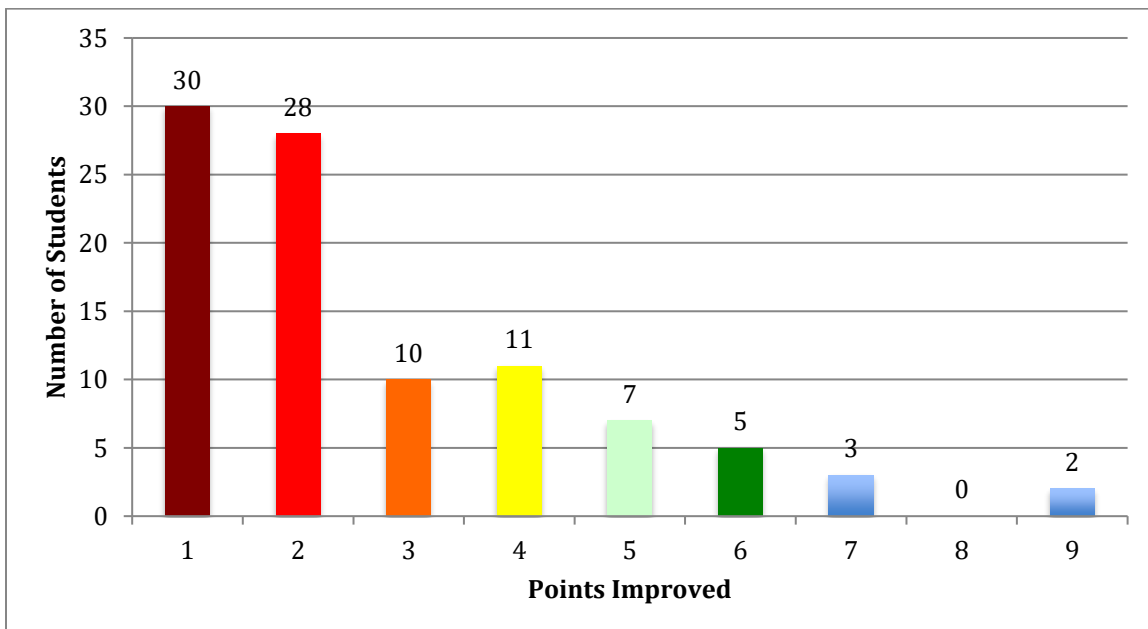

Figure 3. Frequency Distribution of Observed Math Score Changes

The distribution of score improvements between the pre- and post- scores for the English subject area is provided in Figure 4 (below). In total, 67.69% of students showed improvement, for an average gain of 3.38 points. The maximum score gain was 12 points.

Figure 4. Frequency Distribution of Observed English Score Changes

The distribution of score improvements between the pre- and post- scores for the Science subject area is provided in Figure 5 (below). In total, 55.41% of students showed improvement, for an average gain of 3.12 points. The maximum score gain was 8 points.

Figure 5. Frequency Distribution of Observed Science Score Changes

The distribution of score improvements between the pre- and post- scores for the Reading subject area is provided in Figure 6 (below). In total, 60.91% of students showed improvement, for an average gain of 4.12 points. The maximum score gain was 14 points.
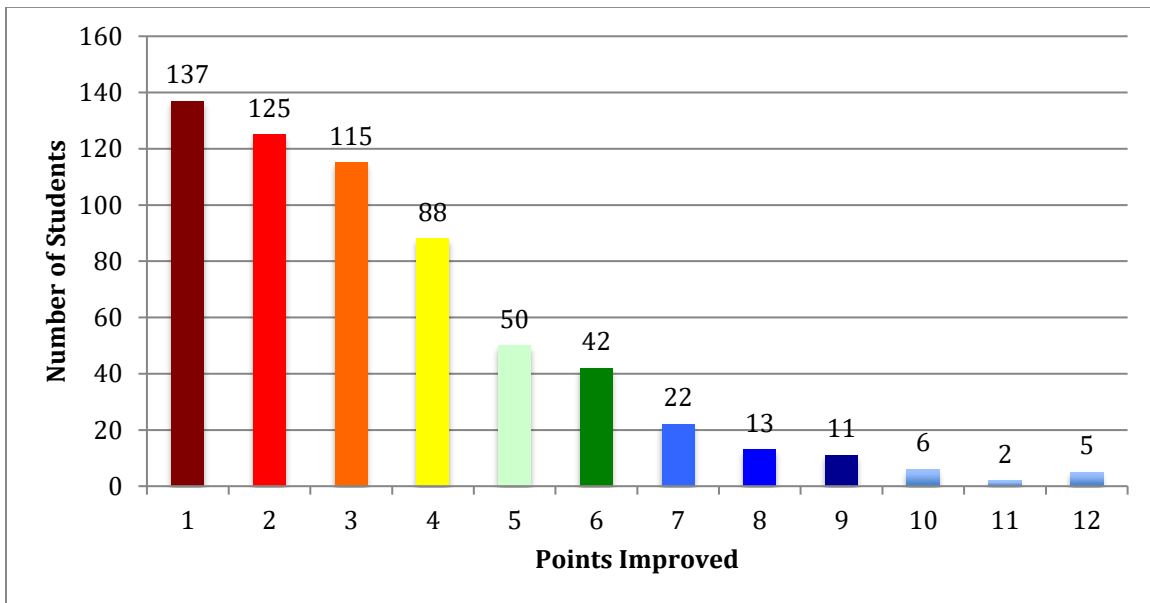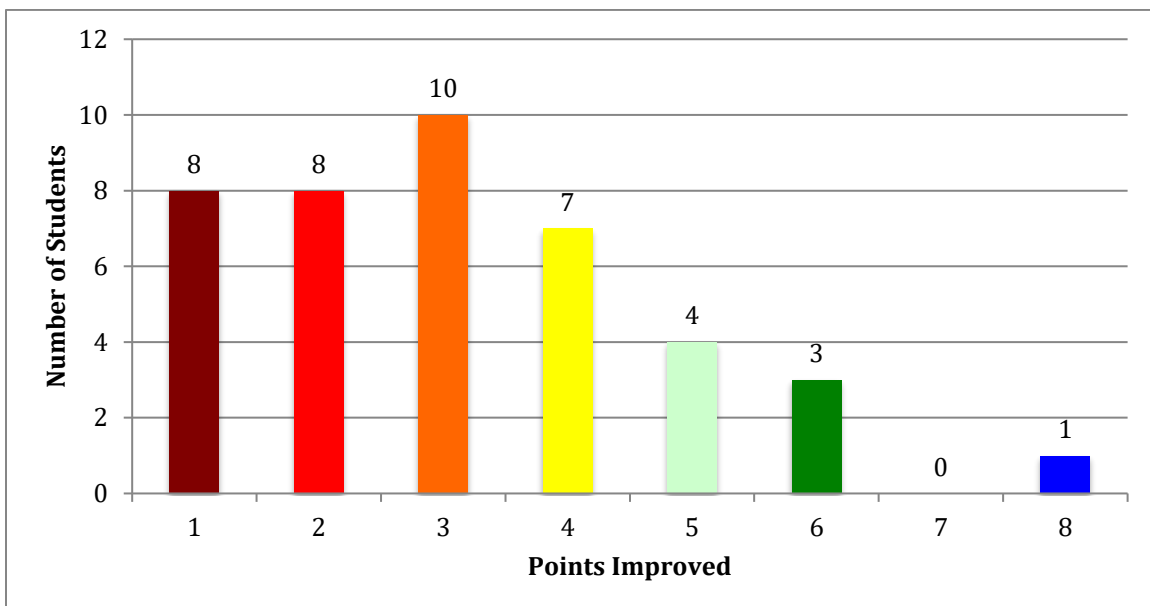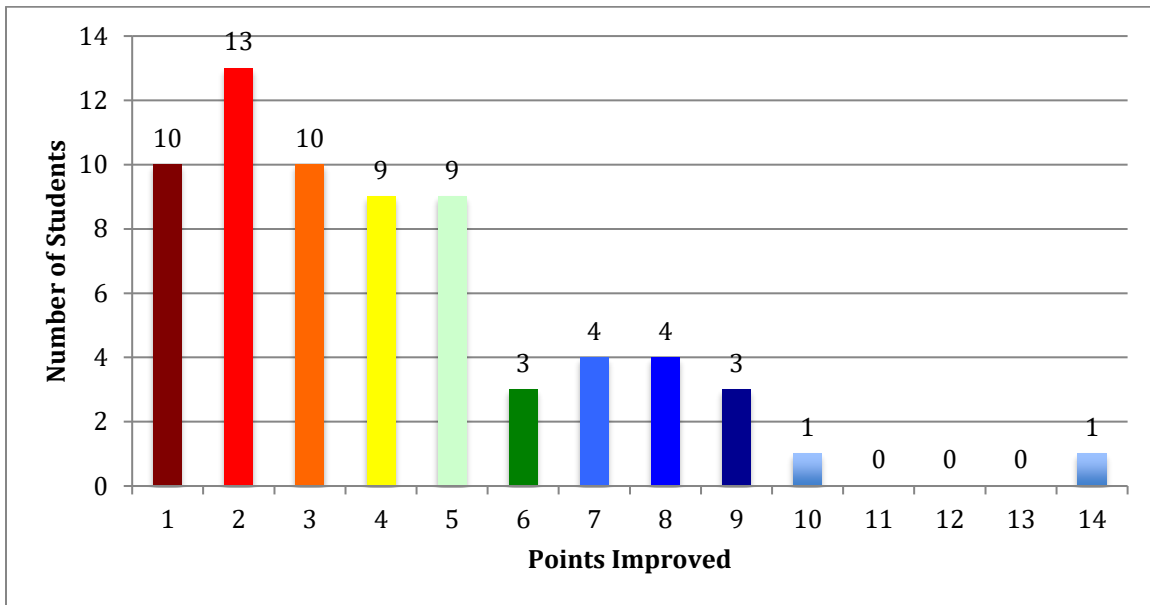
Figure 6. Frequency Distribution of Observed Reading Score Changes

The distribution of score improvements between the pre- and post- scores for the overall composite is provided in Figure 7 (below). In total, 71.62% of students showed improvement, for an average gain of 2.70 points. The maximum score gain was 9 points.
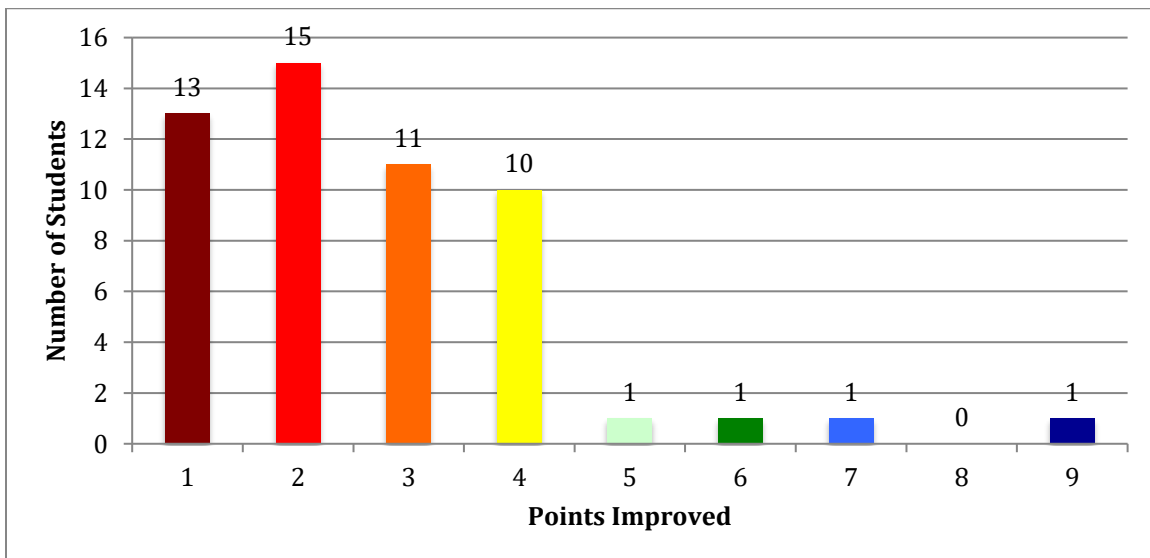
Figure 7. Frequency Distribution of Observed Composite Score Changes

Magnitude of Jumpstart's Impact on Mississippi Public High Schools' Graduating Class Composite ACT Exam Average: +1.93 Points

Graduating class averages include the best observed ACT exam composite score for each student from all prior attempts, including the state mandated test provided to all Mississippi Junior students. These results are broken into three groups: those students with pre-scores who showed

improvement with the aid of Jumpstart (n=53), those students who did not improve (n=21), and those students who had no pre-test to formally track improvement (n=192). The assumption that this third group of students improved at similar rates to the group of students where pre- and post-test scores were observed is imposed. This means it is expected there is a similar rate of students to show improvement (71.62%) with a similar rate of improvement among that group (+2.70 points). Given that the group of non-improvers (28.38%) will have a score change of zero, it is determined that the average score gain per student is equal to +1.93 points (2.70 x 0.7162 = 1.93).

Group Description	#	Avg. Score Impact
Students w/ pre-test, who improved	53	+2.70
Students w/ pre-test, who did not improve	21	+0.00
Students w/ no pre-test	192	+1.93
All students	**266**	**+1.93 PT Improvement in MS HS's Graduation Class ACT Composite Average**

Table 2. Magnitude of Impact on Composite Score

Statistical Tests of Program Effectiveness

Statistical tests are to confirm that the visual performance gains are statistically significant: or, in other words, that it can be concluded these improvements seen among this sample of students is likely to be meaningful and expected to generalize to all students in the population.

See Table 3 for the overall results, in which it is shown that improvements are statistically significant for all students in three of the four individual subject areas (Math, English and Reading), as well as at the Composite exam level. The improvement for Science is found to be statistically significant when considering only those students that improved, although when also considering students that did worse (or the same) on the actual exam attempt the average improvement (+0.51 points) cannot be safely distinguished from a base value of zero.

Importantly, this test of program effectiveness is conservative in that it includes students who actually performed worse on the state wide testing date, which could be due to a student being comfortable with an earlier earned score, among other factors. Moreover, it is well established that students have less improvement to gain on repeat exam attempts, meaning that our approach to require at least one formal prior test attempt upon which to gauge improvement is inherently rigorous.

The second column of Table 3 shows the magnitude and statistical significance of the rates of improvement in all subject areas and the composite among the group of students who showed improvement from the pre-test to the post-test.

	All Students (Including Post- Decreases)	Those Who Improved
Math	+1.44 (8.50%) ** [n=141]	+2.75 (15.95%) ** [n=96]
English	+1.81 (12.47%) ** [n=910]	+3.38 (22.26%) ** [n=616]
Science	+0.51 (4.59%) [n=74]	+3.12 (19.65%) ** [n=41]
Reading	+1.64 (11.70%) ** [n=110]	+4.12 (25.80%) ** [n=67]
Composite	+1.54 (9.54%) ** [n=74]	+2.70 (16.28%) ** [n=53]

Table 3. Student Improvement Analysis; One Tail T-Tests of Significance; ** p<.05; * p<.10

Improvements Observed by Gender

Narrowing in on the rates of improvement observed by type of student, Table 4 provides a gender breakdown, in which the average rate of improvement is measured among males and females with positive score developments. Once again, t-tests are applied to confirm that these observed improvements are significantly different from zero. All results are significant.

	Males	Females
Math	+2.74 (15.35%) ** [n=38]	+2.77 (16.41%) ** [n=56]
English	+3.25 (20.93%) ** [n=261]	+3.46 (23.30%) ** [n=317]
Science	+2.82 (15.78%) ** [n=17]	+3.35 (22.50%) ** [n=23]
Reading	+4.26 (24.82%) ** [n=31]	+3.94 (26.56%) ** [n=34]
Composite	+2.41 (13.57%) ** [n=22]	+2.87 (18.02%) ** [n=30]

Table 4. Gender Breakdown; One Tail T-Tests of Significance; ** p<.05; * p<.10

Improvements Observed by Ethnicity

Table 5 provides an ethnicity breakdown. Historically Disadvantaged (African Americans, Latinos, Native Americans, Pacific Islander) and Whites/Asians are the two groups of analysis interest here. Substantive gains are found for both groups.

	Historically Disadvantaged	Whites / Asians
Math	+2.00 (12.16%) ** [n=29]	+2.84 (15.57%) ** [n=51]
English	+3.42 (26.53%) ** [n=197]	+3.32 (19.69%) ** [n=351]
Science	+3.00 (18.02%) ** [n=15]	+3.67 (24.07%) ** [n=15]
Reading	+3.19 (21.50%) ** [n=26]	+4.71 (26.69%) ** [n=28]
Composite	+2.00 (12.12%) ** [n=15]	+2.92 (16.66%) ** [n=24]

Table 5. Ethnicity Breakdown; One Tailed T-Tests of Significance; ** p<.05; * p<.10

Improvements Observed by School Quality

Table 6 provides a breakdown by school quality, as measured by Greatschools.org. High quality schools are those given a 2020-2021 academic year rating of 7 out of 10 or higher, while low/mid quality schools are those with ratings of 6 or lower. All gains are positive and significant.

	High Quality Schools	Low/Mid Quality Schools
Math	+2.86 (16.61%) ** [n=22]	+2.72 (15.75%) ** [n=74]
English	+3.41 (22.08%) ** [n=346]	+3.36 (22.49%) ** [n=270]
Science	+3.76 (23.80%) ** [n=17]	+2.67 (16.71%) ** [n=24]
Reading	+5.05 (29.09%) ** [n=21]	+3.70 (24.30%) ** [n=46]
Composite	+2.92 (16.53%) ** [n=26]	+2.48 (16.03%) ** [n=27]

Table 6. School Quality Breakdown; One Tailed T-Tests of Significance; ** p<.05; * p<.10

In sum, it is clear that similar rates of improvement that may be attributed to Jumpstart Test Prep are shared among students from different genders, ethnicities and schools attended.

JTP Impact on Graduation Rate – At Risk Algebra 1 Students

The following analysis (reported in Table 7 below) considers the impact of the Jumpstart Test Prep ACT Math review on aiding students' improvement to reach an ACT Math section score of 17 or higher from prior best observed score; or, in the case with no prior score, the likely impact the Jumpstart program had in helping a student achieve a 17 or higher that would have otherwise scored a 16 or lower. Achievement of 17 on the Math section of the ACT is an approved option for students who fail to meet the Algebra I end-of-course (EOC) graduation requirement. This risk of failing to graduate due to not meeting this requirement is reduced by 19.96% as 107 of 536 at-risk students cross the alternative Math subject level ACT score threshold at our group of 19 Mississippi Public High Schools with the assistance of Jumpstart Test Prep.

Group of Students	Number in Group	Graduation Risk Mitigated (Scored 17 or higher)
Not at risk	82	n/a
At risk (16-16.99)	*33*	*17*
At risk (15-15.99)	*24*	*5*
At risk (13-14.99)	*13*	*3*
At risk (12.99 or less)	*3*	*0*
At risk (no prior score)	*463*	*82*
At risk (total)	**536**	**107**
Overall Impact	**w/o Jumpstart:** 536 (of 618) students at risk **w/ Jumpstart:** 429 (of 618) students at risk **Impact:** 19.96% graduation risk reduction due to Algebra 1 end-of-course failure	

Table 7. Math Threshold Analysis

JTP Impact on Graduation Rate – At Risk English II Students

Table 8 reports a similar analysis for the English portion of the ACT exam. Achievement of 17 on the English section of the ACT is an approved option for students who fail to meet the English II end-of-course (EOC) graduation requirement. This risk of failing to graduate due to not meeting this requirement is reduced by 27.55% at our group of 19 Mississippi High Schools as 578 of 2,098 at-risk students cross the alternative English subject ACT score threshold with Jumpstart.

Group of Students	Number in Group	Graduation Risk Mitigated (Scored 17 or higher)
Not at risk	521	n/a
At risk (16-16.99)	*65*	*42*
At risk (15-15.99)	*97*	*47*
At risk (13-14.99)	*117*	*29*
At risk (12.99 or less)	*180*	*20*
At risk (no prior score)	*1,639*	*440*
At risk (total)	**2,098**	**578**
Overall Impact	**w/o Jumpstart:** 2,098 (of 2,619) students at risk **w/ Jumpstart:** 1,520 (of 2,619) students at risk **Impact:** 27.55% risk reduction due to English II end-of-course failure	

Table 8. English Threshold Analysis

JTP Impact on Graduation Rate – At Risk Biology Students

Table 9 reports a similar analysis for the Science portion of the ACT exam. Achievement of 17 on the Science section of the ACT is an approved option for students who fail to meet the Biology 1 end-of-course (EOC) graduation requirement. This risk of failing to graduate due to not meeting this requirement is reduced by 42.28% at our group of 19 Mississippi High Schools as 104 of 246 at-risk students cross the alternative Biology subject level ACT score threshold with the assistance of Jumpstart Test Prep.

Group of Students	Number in Group	Graduation Risk Mitigated (Scored 17 or higher)
Not at risk	48	n/a
At risk (16-16.99)	*11*	*8*
At risk (15-15.99)	*8*	*5*
At risk (13-14.99)	*6*	*3*
At risk (12.99 or less)	*4*	*1*
At risk (no prior score)	*217*	*87*
At risk (total)	***246***	**104**
Overall Impact	**w/o Jumpstart:** 246 (of 294) students at risk **w/ Jumpstart:** 142 (of 294) students at risk **Impact:** 42.28% risk reduction due to Biology end-of-course failure	

Table 9. Science Threshold Analysis

JTP Impact on Graduation Rate – At Risk U.S. History Students

Table 10 reports a similar analysis for the Reading portion of the ACT exam. Achievement of 17 on the Reading section of the ACT is an approved option for students who fail to meet the U.S. History end-of-course (EOC) graduation requirement. This risk of failing to graduate due to not meeting this requirement is reduced by 23.04% at our group of 19 Mississippi High Schools as 97 of 421 at-risk students cross the alternative reading subject level ACT score threshold with the assistance of Jumpstart Test Prep.

Group of Students	Number in Group	Graduation Risk Mitigated (Scored 17 or higher)
Not at risk	71	n/a
At risk (16-16.99)	*10*	*7*
At risk (15-15.99)	*9*	*5*
At risk (13-14.99)	*17*	*7*
At risk (12.99 or less)	*10*	*3*
At risk (no prior score)	*375*	*75*
At risk (total)	**421**	**97**
Overall Impact	**w/o Jumpstart:** 421 (of 492) students at risk **w/ Jumpstart:** 324 (of 492) students at risk **Impact:** 23.04% risk reduction due to U.S. History end-of-course failure	

Table 10. Reading Threshold Analysis

Accounting for Expected Re-Test ACT Score Gains

It should be noted that our analysis relies on assessing score gains from a prior exam attempt to a current exam attempt in order to analyze at the student level and to rigorously account for student-specific factors that may affect final achieved scores. A known aspect for repeat test-takers that demands some analytic attention, however, is that they are known to improve to some degree in repeat test-taking situations. Improvement may be attributed to: additional studying effort put in; learning how to take a certain exam; the use of test prep materials; and/or the tendency to only invoke a re-take after a poor initial showing (relative to one's own standards). Indeed, the ACT exam operators publish data related to these expected re-test ACT Composite score gains noting that "more than half" of test-takers experience score gains on a subsequent exam attempt with average score gains of "nearly 1 point" by those who do improve (https://files.eric.ed.gov/fulltext/ED591977.pdf).

This analysis seeks to compare observed score growth against these benchmarks. Benchmarks are set to: 50% of students improved and an average score gain of 1 point among those who do improve. While ACT reports data relative to Composite score changes only, these benchmarks are used to analyze improvements at both the Composite and individual subject levels. Results are reported in Table 11. Gains exceed all benchmarks, except for Science's improvement rate.

	Improvement Rate (Against 50% Benchmark)	Score Gain (Against +1 Point Benchmark)
Math	**68.09% ** [n=141]**	**+2.75 (15.95%) ** [n=96]**
English	**67.69% ** [n=910]**	**+3.38 (22.26%) ** [n=616]**
Science	55.41% [n=74]	**+3.12 (19.65%) ** [n=41]**
Reading	**60.91% ** [n=110]**	**+4.12 (25.80%) ** [n=67]**
Composite	**71.62% ** [n=74]**	**+2.70 (16.28%) ** [n=53]**

Table 11. ACT Composite Benchmark Analysis; One Tail T-Tests; ** p<.05; * p<.10

Summary

In conclusion, the pilot of the Jumpstart Test Prep complete ACT review at 19 Mississippi Public High Schools led to substantial improvements in ACT exam scores. Nearly three-quarters of students with previous exam attempts experienced a Composite score increase, with an average Composite point of gain of 2.70 among those students who did improve. Observed average rates of improvement were even higher by subject area: Math (2.75), English (3.38), Science (3.12) and Reading (4.12). Gains were shared across gender, ethnicity and school quality factors and implementation of the program reduced subject level end-of-course graduation requirement risks by 20% to 42%. It is key to reiterate here that rigorous aggregate level t-tests in which pre- to post- score changes are assessed demonstrated that three of the four subject areas and the composite average saw statistically significant positive score changes at the critical p-value of .05 (see Column 1 of Table 3). The only non-significant result is for Science. This threshold effectively gives us 95% confidence that the results observed in this sample would generalize to the population of interest (i.e., all High School Juniors). Lastly, a benchmark analysis against ACT reported exam improvement rates and amounts for repeat test-takers was investigated for additional results robustness: this additional rigor further confirmed the core results.

Appendix

#	High School	District	Appl N-Count	App rpt w/actual ACT pre-score	Jr N-Count	Conf. ACT Pre-Score N-Count	Post JTP ACT TERST DATE
1	Brookhaven HS	Brookhaven SD	202	32	198	36	23-Feb
2	Loyd Star AC	Lincoln County SD	47	21	41	21	23-Feb
3	D'Iberville HS	Harrison County SD	301	42	294	46	23-Feb
4	Houston HS	Houston SD	120	18	121	67	23-Feb
5	Pass Christian HS	Pass Christian Public SD	159	150	161	142	23-Feb
6	Petal HS	Petal SD	305	75	309	258	23-Feb
7	Yazoo County HS	Yazoo County SD	105	16	104	38	23-Feb
8	East Marion HS	Marion County SD	64	7	54	7	23-Mar
9	Kemper County HS	Kemper County SD	84	10	81	38	23-Mar
10	Lawrence County HS	Lawrence County SD	131	27	148	38	23-Mar
11	Magee HS	Simpson County SD	102	19	94	14	23-Mar
12	Mendenhall HS	Simpson County SD	134	23	132	37	23-Mar
13	Mize AC	Smith County SD	58	19	65	17	23-Mar
14	East Webster HS	Webster County SD	70	14	70	18	23-Mar
15	Grenada HS	Grenada SD	208	23	203	43	23-Mar
16	Horn Lake HS	Desoto County SD	341	65	357	100	23-Mar
17	Humphreys County HS	Humphreys County SD	117	12	118	2	23-Mar
18	Nettleton HS	Nettleton SD	96	48	98	8	23-Mar
19	Newton County HS	Newton County SD	119	20	119	57	23-Mar
20	Olive Branch HS	Desoto County SD	299	70	299		23-Mar
21	Ripley HS	South Tippah SD	112	14	107	21	23-Mar
22	Stone HS	Stone County SD	159	22	154	26	23-Mar
23	Strayhorn HS	Tate County SD	63	12	63	15	23-Mar
24	Tylertown HS	Walthall County SD	60	7	59	36	23-Mar
25	West Lauderdale HS	Lauderdale County SD	160	23	142	91	23-Mar
26	Leland HS	Leland School District	53	12	49	16	30-Mar
27	Jefferson County HS	Jefferson County SD	77	11	70	62	30-Mar
28	Coahoma County HS	Coahoma County SD	71	15	65	N/A	6-Apr
29	Houlka AC	Chickasaw County SD	29	29	29	29	6-Apr
30	Senatobia HS	Senatobia Municipal SD	138	18	135	21	6-Apr
31	Wilkinson County HS	Wilkinson County SD	80	10	80	18	13-Apr
			4064	884	4019	1322	
	Orange High School – All Subject Prep (With exceptions noted)						
	Green High School – English Only						

Appendix 1. Overview of Schools Selected for Pilot

School	#	Math	English	Science	Reading	Composite
Brookhaven HS	36	77.78%	66.67%	---	66.67%	---
Coahoma County HS	---	---	---	---	---	---
D'Iberville HS	45	---	62.22%	---	---	---
East Marion HS	---	---	---	---	---	---
East Webster HS	18	55.56%	72.22%	50.00%	55.56%	66.67%
Grenada HS	42	---	88.10%	---	---	---
Horn Lake HS	75	---	69.33%	---	---	---
Houlka AC	---	---	---	---	---	---
Houston HS	---	---	---	---	---	---
Humphreys Co. HS	---	---	---	---	---	---
Jefferson County HS	5	100.00%	80.00%	40.00%	40.00%	80.00%
Kemper County HS	---	---	---	---	---	---
Lawrence County HS	31	64.52%	70.97%	---	---	---
Leland HS	15	33.33%	66.67%	73.33%	46.67%	60.00%
Loyd Star AC	20	80.00%	65.00%	55.00%	65.00%	70.00%
Magee HS	---	---	---	---	---	---
Mendenhall HS	---	---	---	---	---	---
Mize AC	16	75.00%	87.50%	50.00%	68.75%	87.50%
Nettleton HS	8	---	62.50%	---	---	---
Newton County HS	57	---	75.44%	---	---	---
Olive Branch HS	---	---	---	---	---	---
Pass Christian HS	120	---	75.83%	---	---	---
Petal HS	221	---	61.54%	---	---	---
Ripley HS	21	---	71.43%	---	---	---
Senatobia HS	---	---	---	---	---	---
Stone HS	25	---	72.00%	---	---	---
Strayhorn HS	---	---	---	---	---	---
Tylertown HS	33	---	60.61%	---	---	---
West Lauderdale HS	85	---	57.65%	---	---	---
Wilkinson Co. HS	---	---	---	---	---	---
Yazoo County HS	37	---	59.46%	---	---	---

Appendix 2. Percentage of Students Improved: School by School

School	Math	English	Science	Reading	Composite
Brookhaven HS	2.25	3.46	---	3.46	---
Coahoma County HS	---	---	---	---	---
D'Iberville HS	---	3.21	---	---	---
East Marion HS	---	---	---	---	---
East Webster HS	3.10	3.46	3.11	6.60	2.75
Grenada HS	---	3.73	---	---	---
Horn Lake HS	---	3.17	---	---	---
Houlka AC	---	---	---	---	---
Houston HS	---	---	---	---	---
Humphreys County HS	---	---	---	---	---
Jefferson County HS	1.60	4.75	3.00	4.00	2.25
Kemper County HS	---	---	---	---	---
Lawrence County HS	2.95	2.86	---	---	---
Leland HS	2.00	2.60	2.73	2.57	1.67
Loyd Star AC	3.81	3.23	2.55	4.69	3.07
Magee HS	---	---	---	---	---
Mendenhall HS	---	---	---	---	---
Mize AC	2.67	4.93	4.50	3.64	3.07
Nettleton HS	---	2.60	---	---	---
Newton County HS	---	3.49	---	---	---
Olive Branch HS	---	---	---	---	---
Pass Christian HS	---	4.07	---	---	---
Petal HS	---	3.10	---	---	---
Ripley HS	---	2.60	---	---	---
Senatobia HS	---	---	---	---	---
Stone HS	---	3.67	---	---	---
Strayhorn HS	---	---	---	---	---
Tylertown HS	---	3.60	---	---	---
West Lauderdale HS	---	2.94	---	---	---
Wilkinson County HS	---	---	---	---	---
Yazoo County HS	---	3.14	---	---	---

Appendix 3. Average Points Improved Among Students Who Do Improve: School by School