Evaluation of LINC's Caring Communities Sites

21st Century Community Learning Center Programs

Cohort 7, Year 5

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Introduction

This report summarizes the findings from Georgia State University's evaluation of LINC Caring Community sites funded as 21st Century Community Learning Centers (21C). This report includes findings from three LINC sites in Grandview, which comprise Cohort 7 and were in their fifth year of 21C funding during the 2016-2017 school year.

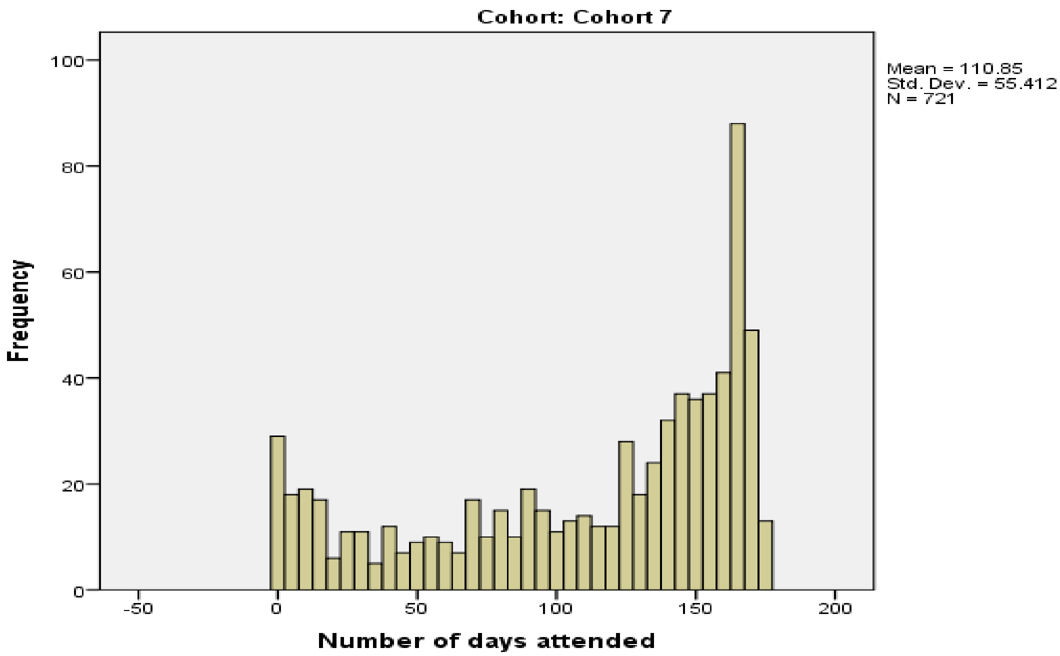
The data sources for the evaluation consist of de-identified data provided by the program. LINC staff rated **student engagement in after-school program activities**. School teachers also rated **improvements in students' school behavior.** Last, **academic grades in math, reading and science** were examined for students. Outcome analyses tested the **effects of students' participation in the LINC 21C program** on change in school behavior and academic achievement over the school year, using program attendance data and engagement ratings. We use the Harvard Family Research Project's three-part model of program participation, in which **participation consists of program enrollment, program attendance, and engagement in program activities**. In order for after-school programs to have beneficial effects on student achievement, students should not just be enrolled but attend regularly and also be engaged in program activities.

Participation in after-school programs, and its effects on student behavior and achievement should also be enhanced by the quality of an after-school program (e.g., Mahoney et al., 2007). The quality of LINC 21CCLC program sites was independently assessed by trained evaluators using the Weikart Center for Youth Program Quality's Program quality Assessment (PQA) tool. The PQA is a well-validated assessment, which scores programs based on safe environment, supportive environment, interaction, and engagement on a scale from 1 to 5. Scores of 5 represents widely available and frequent best practices. Overall PQA ratings ranged from 3.7 to 4.0 across sites, representing above-average quality scores.

Parents were also surveyed about their thoughts of the program and its effects on their children. Survey questions asked parents to rate statements on a scale of 1-5, with responses ranging from "almost never true" (1) to "almost always true" (5). Survey data were available from 90 parents whose children participated in the LINC program. The percentage of parents who responded with a 4 or 5 was combined, indicating that the statement was true at least most of the time. 78% of parents reported that their child had developed better work habits as a result of participating in the program, and most parents reported that their child had developed more confidence in math (80%), reading (73%), and science (78%). Likewise, 78% of parents reported an increase in their child's interest in learning as a result of participating in the program, and 88% reported that their child enjoys the activities offered in the after-school program. **These findings indicate that parents believe the LINC program is having a positive effect on their children.**

LINC Program Attendance

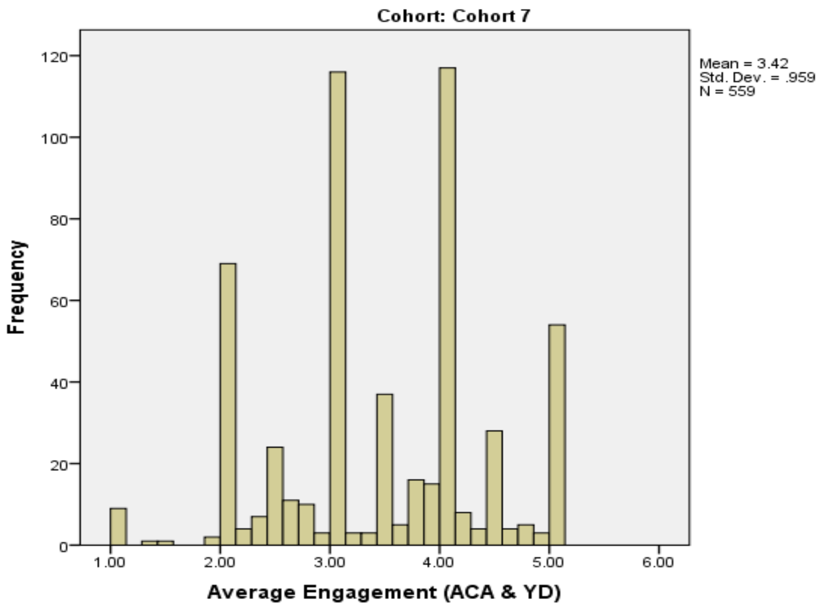
Daily program attendance data were available for 721 students (compared to 758 students in the previous year) enrolled in the Cohort 7 sites. The average days attended for the 2016-2017 school year was 111 days (*SD* = 55), compared to 126 days (*SD* = 42) in the previous year. There was a wide range from 0 days to 175 days with 2.9% of students enrolling but never attending the program. **As indicated in the figure below, overall program attendance was high**.



Student Engagement in Program Activities

During the spring semester LINC staff rated students' engagement during a range of after-school activities. Engagement entails enjoyment of, interest in, and sustained attention and effort focused on an activity. Staff members indicated how often (*never = 1, on occasion = 2, some of the time = 3, most of the time = 4, all of the time = 5*) each student pays attention, seems interested in the subject, on task, and seems to have fun. Student engagement represents each student's average rating during academic and youth development activities. Higher scores indicate a student was more engaged in academic and youth development activities during the LINC after-school program. Engagement data were available for 559 students compared to 517 students in the previous year.

As shown in the figure on the next page, **the overall level of student engagement in academic and youth development activities, as rated by program staff, was moderate to high**. The average engagement score was 3.42 (*SD* = 0.96) out of 5. This average level of engagement compares to a mean of 4.06 (*SD* = 1.05) found in last year's evaluation.



Factors Predicting Participation

Unlike in last year's evaluation, the two facets of participation – program attendance and engagement in program activities – were positively correlated with one another, $r = .14$, $p < .01$, suggesting that students who attended the LINC program more were rated as more engaged in program activities. Engagement in program activities was also positively associated with academic achievement in the fall and spring, except for spring grades for math and science. The magnitude of the associations ranged from $r = .15$ to $.25$, $p < .05$.

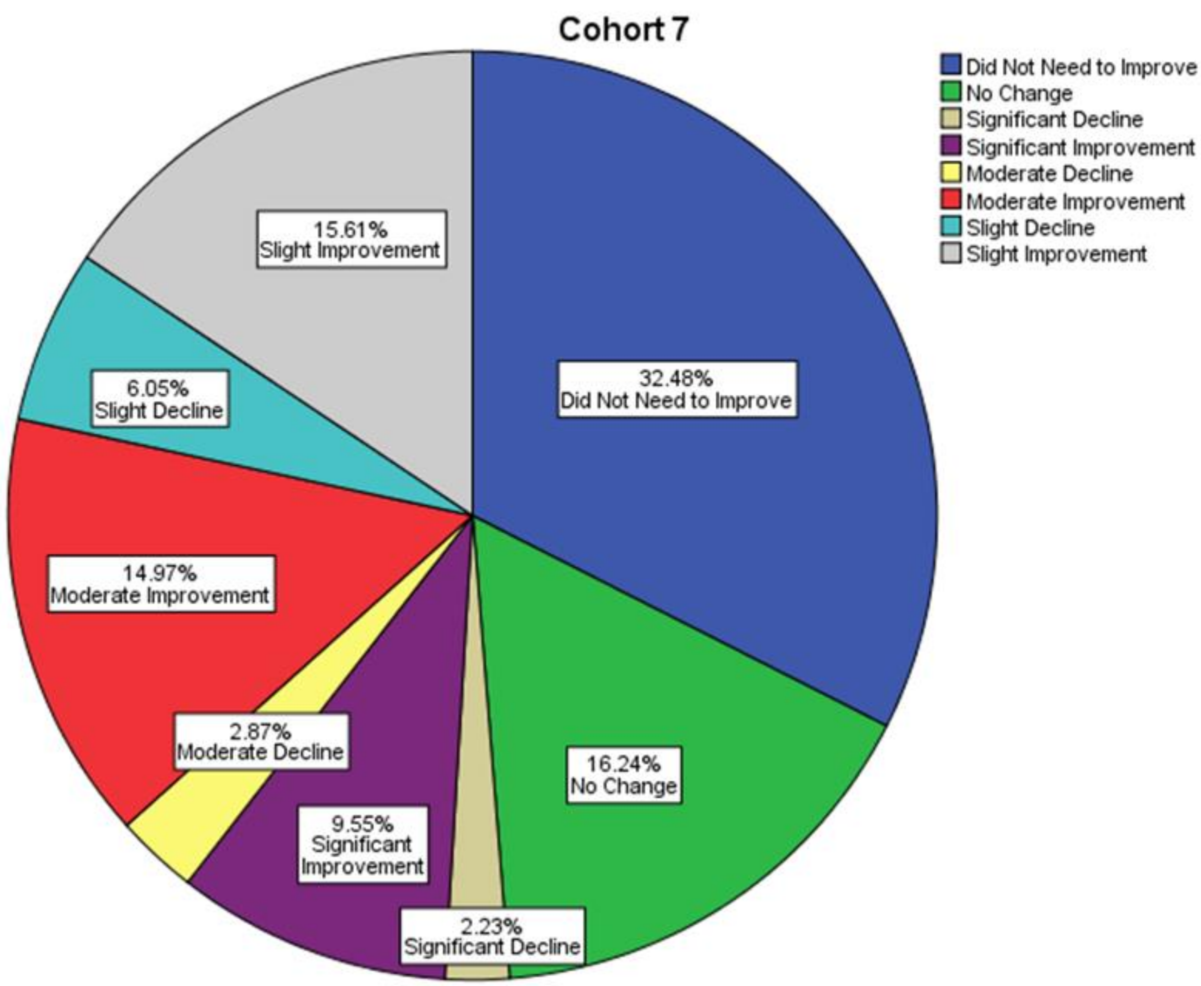
Subsequent analyses tested for factors that may predict students' levels of participation. Separate linear regression models were run in which program attendance and student engagement were regressed on the following predictor variables: Grade level, first quarter academic grades, and whether or not teachers rated students as needing improvement at the start of the school year as part of their overall behavioral assessment. Analyses also statistically controlled for program site. Detailed results tables are included in Appendix A.

First quarter math grades were uniquely, positively associated with students' program attendance. That is, **students with higher math grades in the fall attended the LINC program more over the school year**. This is the opposite of what was found in last year's evaluation, in which students with higher math grades in the fall attended the LINC program *less* frequently. None of the other predictor variables tested were uniquely associated with students' attendance, replicating last year's findings.

First quarter science grades were positively associated with engagement in program activities, a finding that was reported in last year's evaluation as well. **Students with higher science grades in the fall were rated as more engaged in after-school program activities**. None of the other predictor variables tested were uniquely associated with students' engagement in program activities.

Teacher Ratings of Improvement in School Behavior

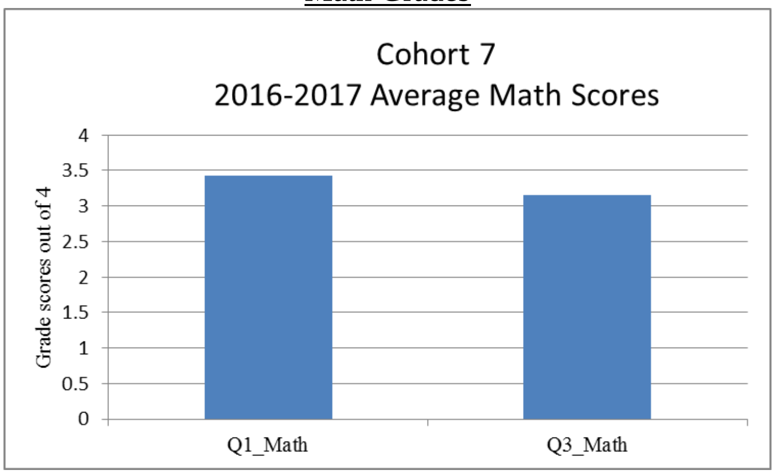
Teacher ratings of changes in student behavior on the DESE Teacher Survey were provided for approximately 314 students who attended the 21CCLC program at least 30 days. For the DESE survey, teachers report on changes over the school year in 10 dimensions of student behavior – academic performance, class attendance, class attentiveness, behaving well in class, gets along with other students, arrives motivated to learn, turns in homework on time, completes homework satisfactorily, participation in class, and volunteering for additional activity – as well as an overall assessment of student behavior. Teachers indicate whether functioning was acceptable at the start of the school year so that the student *did not need to* improve; if level of functioning at the start of the school year was not at an acceptable level, teachers rate change over the school across the following response categories: *significant decline*, *moderate decline*, *slight decline*, *no change*, *slight improvement*, *moderate improvement*, *significant improvement*. The figure below shows the teacher ratings for their overall assessment of student behavior. In terms of overall behavior, 32.5% (compared to 48% in last year's) of students were rated as *did not need to improve*, and 40.2% (compared to 27.9% in last year's evaluation) were rated has having slight, moderate, or significant improvement. **In summary, according to teacher ratings, the majority of the LINC students who needed to improve in school did improve.**



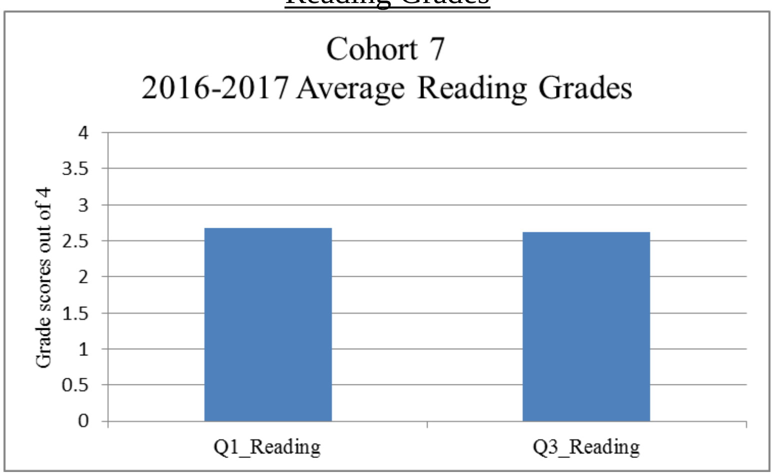
Students' Academic Performance in Math, Reading and Science

Academic grades in math, reading, and science were taken from the first and third quarter marking periods. Because of apparent variability in the use of +/- grading systems, grades were converted to an interval scale where A+, A, and A- = 4, B+, B, and B- = 3, B- = 2.70, C+, C, and C- = 2, and anything below a C- = 1. Math grades from both marking periods were available for 109 students (compared to 255 students in the previous school year). Reading grades from both marking periods were available for 188 students (compared to 190 students in the previous school year) while science grades from both marking periods were available for 174 students (compared to 236 students in the previous school year). Results from paired samples t-test indicated that **there was a slight but statistically significant mean decrease in students' math grades** (t = -3.23, df =108, p < .05) and no changes in reading (t = -.79, df = 187, p = .43) or science grades (t = .282, df = 173, p < .05) from fall to spring. Note that in the previous year, there were slight but significant increases in math and science grades from fall to spring. The figures below and on the following page show the average math, reading, and science grades and from the two marking periods (fall and spring).

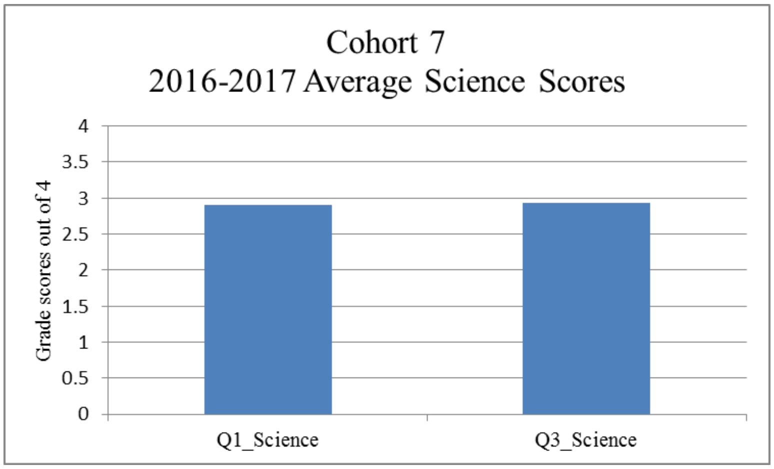
Math Grades



Reading Grades



Science Grades



Effects of Program Participation on Academic Achievement and School Behavior

A primary goal of the evaluation is to assess the impact of participation in LINC's 21C before-and-after school program on students' academic achievement and social competence in school. We used the Harvard Family Project's three-part model of program participation to inform this part of the evaluation. In this model, participation consists of program enrollment, program attendance, and engagement in program activities. In order for after-school programs to benefit student achievement, students should not just be enrolled but attend regularly and also be engaged in program activities. In addition to being linked directly to student outcomes, engagement in after-school programs may also enhance the effects of program attendance on outcomes. Thus, engagement in after-school activities may operate interactively with attendance to promote students' school success.

Academic Grades. To examine the effects of daily program attendance and staff-ratings of students' engagement in program activities on academic achievement, a series of multiple linear regression models was conducted in which math, reading, and science grades from the spring semester were regressed on the additive and interactive effects of engagement and attendance, controlling for program site, grade-level, and grades from the first marking period. Analyses were conducted on a sample of students between 98 and158 who had available data from staff engagement ratings, school records, and program records.

Detailed results tables are presented in Appendix B. **Students rated as more highly engaged in after-school activities performed better in reading over the course of the school yea**r, replicating findings from last year's evaluation. Results also indicated that older students performed less well in science, whereas in last year's evaluation older students performed worse in both science and reading. No other effects of program participation on academic achievement were detected.

Teachers' Overall Assessment of Student Behavior. To examine the effects of daily program attendance and staff-ratings of students' engagement in program activities on teachers' ratings of improvement over the school year, an improvement rating variable was constructed based on the 11 teacher ratings (10 domains plus overall behavioral assessment). For each item, students who were not rated as *did not need to improve* were assigned a score of 1 (*significant decline*) to 7 (*significant improvement*), and their scores were averaged across the 11 items. Thus, scores on the composite improvement rating reflect the average improvement across all domains that a given student was deemed as not functioning at an acceptable level at the start of the school year. Students who received ratings of *did not need to improve* in the overall teacher assessment were excluded from the analyses. Analyses are based on a small subsample of 162 students that were assessed by their teachers as needing to improve in at least one domain at the start of the school year.

Detailed results tables are presented in Appendix C. The composite improvement rating was regressed on the additive and interactive effects of engagement and attendance, controlling for site and grade level. While no main or interactive effects of program attendance or engagement in program activities on average teacher ratings of improvement were detected, results indicated that teacher ratings for improvement among older students were higher than those for younger students. Similar to last year's evaluation, program participation, as gauged by program attendance and engagement in program activities, was not associated with teachers' ratings of behavior in school.

Summary and Conclusions

Overall, students attended the LINC program regularly and were rated as being moderately to highly engaged in program activities. Parents also reported that the LINC program had positive effects on their children, helping them to develop better work habits and increasing their confidence in school and their interest in learning, and teacher ratings indicated that the majority of the LINC students who needed to improve in school did improve.

These perceptions did not receive much support in analyses examining change in student grades over the school year. Overall, LINC students' grades in reading and science did not change over the school year, and students' grades in math actually decreased slightly. Tests of whether greater participation in the LINC program – in terms of frequency of attendance and engagement in activities – was associated with school performance did not detect any main or interactive effects of program attendance on academic grades or teachers' ratings of behavioral improvement over the school year. Engagement in LINC activities was significantly associated with increased academic performance in reading, but not in math or science.

Several notable weaknesses limit the conclusions from the evaluation. First, a relatively small proportion of students enrolled in the LINC program had complete data from all sources – program records, school records, staff ratings, and teacher ratings. Thus, it is not clear how generalizable findings are to the larger population of students enrolled in LINC 21C programs. Second, due to the scope of the evaluation and the age range of the students in the program, assessment of students' engagement in after-school activities relied exclusively on staff report. More comprehensive evaluations of engagement would rely on student report and possibly observational ratings. Another limitation is the inability to connect parent surveys with student, staff, and teacher reports to analyze the relationships among parents' perceptions of the program and other variables with outcomes of interest, such as program attendance, engagement, grades, and student behavior. Additionally, given the lack of an experimental design, the direction of effects linking student participation with school outcomes cannot be isolated, limiting causal inferences based on the results.

Although observational ratings of program quality indicated that sites were of overall high quality, there was also some variability in PQA scores across the three sites. The number of sites in Cohort 7 is not sufficiently large to systematically examine the effects of site quality and other site-level characteristics on student participation, achievement, and behavior. The next steps of the evaluation are to pool 21CCLC sites across cohorts to systematically examine effects of site-level characteristics, like program quality, on youth outcomes.

Appendices

A1. Linear Model Predicting Program Attendance

Between-Subjects Factors

		Value Label	N
Site ID	2	Butcher-Greene	6
	4	Martin City	24
	5	Meadowmere	22

Parameter Estimates

Dependent Variable: Daily Program Attendance

					95% Confidence Interval		
Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
Intercept	117.456	45.640	2.574	.014	25.474	209.437	.131
[SiteID=2]	-30.899	21.573	-1.432	.159	-74.376	12.577	.045
[SiteID=4]	-17.356	15.565	-1.115	.271	-48.725	14.013	.027
Grade level	-10.252	6.406	-1.600	.117	-23.163	2.658	.055
Math Q1	**19.326**	**8.043**	**2.403**	**.021**	**3.117**	**35.536**	**.116**
Reading Q1	-1.913	6.646	-.288	.775	-15.308	11.482	.002
Science Q1	3.803	6.637	.573	.570	-9.573	17.178	.007
Needs to improve	-.406	13.210	-.031	.976	-27.030	26.218	.000

Note: Statistically significant effect of interest is bolded.

A2. Linear Model Predicting Staff-ratings of Student Engagement in Program Activities

Between-Subjects Factors

		Value Label	N
Site ID	2	Butcher-Greene	5
	4	Martin City	19
	5	Meadowmere	19

Parameter Estimates

Dependent Variable: Program Engagement

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound	Partial Eta Squared
Intercept	2.638	1.090	2.420	.021	.425	4.851	.143
[SiteID=2]	-.219	.469	-.468	.643	-1.171	.732	.006
[SiteID=4]	.253	.324	.780	.441	-.405	.910	.017
Grade level	-.153	.132	-1.160	.254	-.421	.115	.037
Math Q1	.108	.185	.584	.563	-.268	.484	.010
Reading Q1	-.015	.146	-.103	.919	-.312	.282	.000
Science Q1	**.325**	**.141**	**2.309**	**.027**	**.039**	**.611**	**.132**
Needs to improve	-.192	.280	-.688	.496	-.760	.375	.013

Note: Statistically significant effect of interest is bolded.

B1. Linear Model Predicting Q3 Math Grades

Between-Subjects Factors

		Value Label	N
Site ID	2	Butcher-Greene	35
	4	Martin City	31
	5	Meadowmere	32

Parameter Estimates

Dependent Variable: Math grade - 3rd Quarter

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound	Partial Eta Squared
Intercept	2.194	.568	3.863	.000	1.066	3.322	.142
[SiteID=2]	-.091	.195	-.468	.641	-.478	.296	.002
[SiteID=4]	-.417	.220	-1.889	.062	-.855	.021	.038
Grade level	-.052	.085	-.613	.542	-.220	.116	.004
Math Q1	.442	.101	4.390	.000	.242	.642	.176
Program engagement	.110	.107	1.026	.308	-.103	.324	.012
Program attendance	-.003	.003	-1.012	.314	-.008	.002	.011
Attendance x engagement	-.001	.002	-.336	.737	-.005	.003	.001

B2. Linear Model Predicting Q3 Reading Grades

Between-Subjects Factors

		Value Label	N
Site ID	2	Butcher-Greene	45
	4	Martin City	48
	5	Meadowmere	65

Parameter Estimates

Dependent Variable: Reading grade - 3rd Quarter

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound	Partial Eta Squared
Intercept	1.905	.467	4.078	.000	.982	2.827	.100
[SiteID=2]	.178	.172	1.032	.304	-.162	.518	.007
[SiteID=4]	-.312	.192	-1.626	.106	-.690	.067	.017
Grade level	-.022	.084	-.264	.792	-.189	.144	.000
Reading Q1	.331	.073	4.562	.000	.188	.475	.122
Program engagement	**.204**	**.098**	**2.077**	**.040**	**.010**	**.397**	**.028**
Program attendance	.000	.002	.112	.911	-.004	.005	.000
Attendance X engagement	.001	.002	.574	.567	-.003	.005	.002

Note: Statistically significant effect of interest is bolded.

B3. Linear Model Predicting Q3 Science Grades

Between-Subjects Factors

		Value Label	N
Site ID	2	Butcher-Greene	26
	4	Martin City	51
	5	Meadowmere	65

Parameter Estimates

Dependent Variable: Science grade - 3rd Quarter

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound	Partial Eta Squared
Intercept	2.666	.473	5.640	.000	1.731	3.601	.192
[SiteID=2]	.276	.207	1.336	.184	-.133	.685	.013
[SiteID=4]	.592	.200	2.962	.004	.197	.987	.061
Grade level	-.208	.085	-2.443	.016	-.376	-.040	.043
Science Q1	.310	.072	4.278	.000	.167	.453	.120
Program engagement	-.041	.116	-.351	.726	-.269	.188	.001
Program attendance	.003	.003	.956	.341	-.003	.009	.007
Attendance X Engagement	.000	.002	-.043	.966	-.005	.005	.000

C. Linear Model Predicting Composite Teacher Rating of School Behavior Improvement

Between-Subjects Factors

		Value Label	N
Site ID	2	Butcher-Greene	57
	4	Martin City	46
	5	Meadowmere	59

Parameter Estimates

Dependent Variable: Composite Teacher Improvement Rating

					95% Confidence Interval		
Parameter	B	Std. Error	t	Sig.	Lower Bound	Upper Bound	Partial Eta Squared
Intercept	4.196	.246	17.067	.000	3.710	4.681	.653
[SiteID=2]	.228	.271	.841	.401	-.308	.765	.005
[SiteID=4]	.305	.264	1.157	.249	-.216	.825	.009
Grade level	.112	.056	1.998	.047	.001	.222	.025
Program engagement	.146	.127	1.142	.255	-.106	.397	.008
Program attendance	.003	.002	1.394	.165	-.001	.008	.012
Attendance X engagement	.002	.002	.812	.418	-.002	.005	.004