## A Matched-Pair Study



# The Impact of the ACE Program on Academic Achievement

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***Submitted by***

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# The Impact of the ACE Program on Academic Achievement: A Matched-Pair Study

## Abstract

EduCare Foundation's ACE (Achievement and Commitment to Excellence) Program is a comprehensive student success and character-building program designed to empower students to achieve excellence in personal, social, and academic pursuits. This study examined the impact of ACE Program participation at fifteen high schools on three school-related outcomes: 1) percentage of credits earned towards graduation (out of those attempted), 2) performance on the California Assessment of Student Performance and Progress (CAASPP) in English-language arts, and 3) performance on the CAASPP in math. Outcomes for ACE Program participants during the 2015-16 academic year were statistically compared with a carefully-matched control group of students who attended after-school programs at the same schools with similar frequency, but did not participate in ACE. The mean percentage of credits earned by ACE Program participants was significantly greater than matched controls with a moderate effect size (.19 standard deviations). The mean scale score of ACE participants on the CAASPP in math was significantly greater than matched controls with a large effect size (.43 standard deviations). The group difference for CAASPP performance in English-language arts was nonsignificant.

## Context of the Study

**EduCare Foundation's ACE (Achievement and Commitment to Excellence) Program** is a comprehensive student success and character-building program designed to empower students to achieve excellence in personal, social, and academic pursuits. ACE is offered as a three-day student workshop supported by parent involvement and teacher professional development, focused on the following socio-emotional learning elements:

- Character development:
  confidence-building, positive decision-making and constructive choices.
- Personal management:
  personal responsibility and accountability.
- Emotional intelligence:
  managing anger, fear, rejection, and peer pressure.
- Interpersonal skills:
  communication, conflict resolution, problem-solving, and team-building.

To determine the impact of participation in the ACE Program on school-related outcomes for students in grades 9-12, the EduCare Foundation commissioned an external evaluation company, ERC, to conduct a quasi-experimental, matched-pair study using data from fifteen Los Angeles Unified School District (LAUSD) High Schools at which the ACE Program was offered during the 2015-16 academic year. Outcomes analyzed included percentage of credits earned towards graduation, and performance on the California Assessment of Student Performance and Progress (CAASPP) in English-language arts and math. Outcomes of ACE Program participants were compared with outcomes of students who participated in the general after-school program at the same schools but did not participate in the ACE Program. Schools included in this study were:

- Academy of Environmental and Social Policy
- Caser Chavez Social Justice Humanitas Academy
- Cesar Chavez Arts, Theater and Entertainment School
- Diego Rivera Communication and Technology School
- Esteban Torres East Los Angeles Performing Arts Magnet
- Esteban Torres East Los Angeles Renaissance Academy
- Esteban Torres Engineering and Technology Academy
- Esteban Torres Humanities Academy of Art and Technology
- Esteban Torres Social Justice Leadership Academy
- Jordan Senior High
- Lincoln Senior High
- Robert F Kennedy New Open World Academy
- San Fernando Senior High
- Sun Valley Senior High
- Washington Preparatory High School

## Methodology

Using a quasi-experimental, matched-pair study design, outcomes for treatment groups of ACE participants were statistically compared with outcomes for carefully-matched control groups. A separate comparison was conducted for each of three outcomes: 1) percentage of credits earned (out of those attempted), 2) scale score on the CAASPP in English-language arts, and 3) scale score on the CAASPP in math.

*Treatment Groups*

For each comparison, the treatment group was comprised of all ACE Program participants at fifteen high schools during 2015-16, and for whom data were available for all matching variables and the outcome variable being compared. Therefore, separate treatment groups were used for each of the four comparisons.

*Control Groups*

Students in the control groups participated in the general after-school program at the fifteen high schools in 2015-16, but did not participate in the ACE Program. Control group students were individually matched to students in each treatment group. They were matched directly based on the following variables:

- School attended in 2015-16
- Grade level
- Gender
- Race/ethnicity
- English learner (EL) status
- Gifted and Talented Education (GATE) status
- Special education status
- Days of attendance in the general after-school program (within one standard deviation)

In cases where more than one direct match for a student in the treatment group existed, a control group student was selected at random. Each individual student could serve as the control group match for only one ACE participant per comparison.

*Statistical Comparisons*

Paired samples t-tests were used for comparing group means for each outcome, with an alpha level of .05 used to determine statistical significance. The paired samples t-test is preferable over the independent samples t-test when control group members are individually matched to treatment group members to form similar pairs. Cohen's *d* was used as the measure of effect size, calculated as the difference in the two groups' means divided by the average of their standard deviations. A *d* of 1 indicates that group means differ by one standard deviation, a *d* of .5 indicates that group means differ by half a standard deviation, and so forth.

## Overview of Results

In 2015-16, the mean percentage of credits earned by ACE Program participants was significantly greater than matched controls with a moderate effect size (.19 standard deviations). The mean scale score of ACE participants on the CAASPP in math was significantly greater than matched controls with a large effect size (.43 standard deviations). The group difference for CAASPP performance in English-language arts was nonsignificant.

### Finding 1: Percentage of Credits Earned Towards Graduation

Percentage of credits earned was calculated as the number of credits earned divided by the number of credits attempted for each student. Table 1 compares characteristics of ACE participants with those of students in the matched control group for the comparison on this outcome.

Table 1. Characteristics of ACE Participants and Matched Controls for Comparison of Percentage of Credits Earned

| | ACE Participants (*n* = 747) | Matched Controls (*n* = 747) | Difference |
|---|---|---|---|
| Days Attended After-School | 14.0 | 11.6 | 2.4 |
| Hispanic | 94.5% | 94.5% | 0.0% |
| Black | 4.6% | 4.6% | 0.0% |
| Asian | 0.3% | 0.3% | 0.0% |
| White | 0.5% | 0.5% | 0.0% |
| Other ethnicity | 0.1% | 0.1% | 0.0% |
| Male | 42.8% | 42.8% | 0.0% |
| Female | 57.2% | 57.2% | 0.0% |
| Free/reduced meal | 89.6% | 85.8% | 3.7% |
| Special education | 8.4% | 8.4% | 0.0% |
| Gifted/talented | 11.0% | 11.0% | 0.0% |
| Limited English proficient | 10.2% | 10.2% | 0.0% |

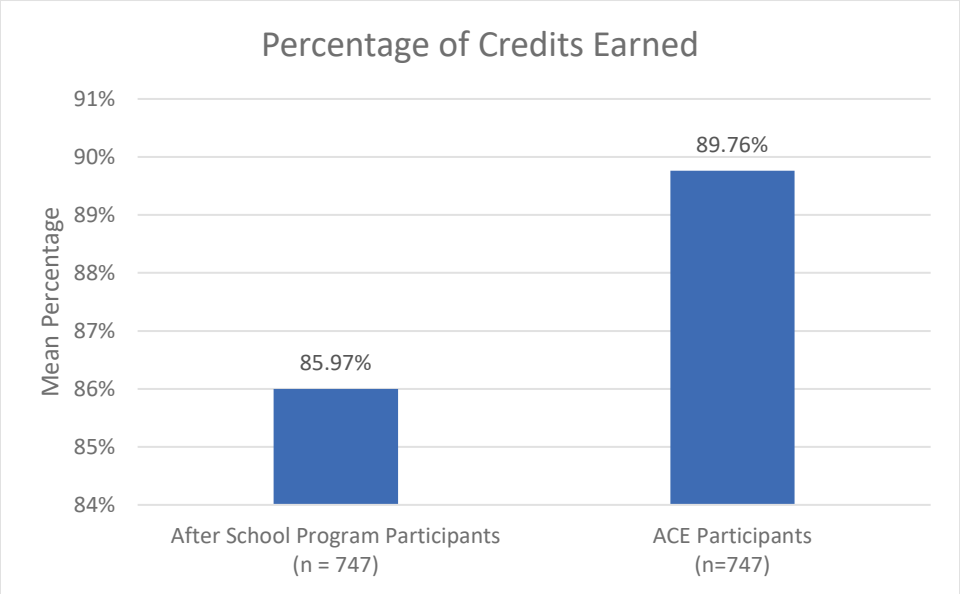
Table 2 shows that in 2015-16, ACE participants earned 3.79% more credits than matched controls. This difference in group means was statistically significant with a moderate effect size (.19 standard deviations). The bar graph in Figure 1 shows actual group means.

Table 2. Comparison of Percentage of Credits Earned by ACE Participants and Matched Controls

| | *M** | *t* | *df* | *p* | *d*** |
|---|---|---|---|---|---|
| % Credits earned | 3.79 | 4.26 | 746 | .001*** | 0.19 |

*Mean of frequent participants minus the mean of matched controls.
**Cohen's *d* was used as the measure of effect size.
***Indicates statistical significance.

Figure 1



**Finding 2: Performance on the California Assessment of Student Performance and Progress (CAASPP) in Math**

Table 3 compares characteristics of ACE participants with those of students in the matched control group for the comparison of CAASPP scale scores in math.

Table 3. Characteristics for ACE Participants and Matched Controls for Comparison of CAASPP Math Scale Score

| | ACE Participants (*n* = 144) | Matched Controls (*n* = 144) | Difference |
|---|---|---|---|
| Days Attended After-School | 16.0 | 14.4 | 1.5 |
| Hispanic | 98.6% | 98.6% | 0.0% |
| Black | 1.4% | 1.4% | 0.0% |
| Asian | 0.0% | 0.0% | 0.0% |
| White | 0.0% | 0.0% | 0.0% |
| Other ethnicity | 0.0% | 0.0% | 0.0% |
| Male | 40.3% | 40.3% | 0.0% |
| Female | 59.7% | 59.7% | 0.0% |
| Free/reduced meal | 87.5% | 81.3% | 6.3% |
| Special education | 6.3% | 6.3% | 0.0% |
| Gifted/talented | 6.3% | 6.3% | 0.0% |
| Limited English proficient | 2.8% | 2.8% | 0.0% |

Table 4 and Figure 2 show that in 2015-16, the mean scale score of ACE participants was 38.97 higher than matched controls on the CAASPP in math. This difference in group means was statistically significant with a large effect size (.43 standard deviations). The bar graph in Figure 2 shows actual group means.

Table 4. Comparison of CAASPP Math Score of ACE Participants and Matched Controls

| | *M** | *t* | *df* | *p* | *d*** |
|---|---|---|---|---|---|
| CAASPP Math Score | 38.97 | 3.93 | 143 | .001*** | 0.43 |

*Mean of frequent participants minus the mean of matched controls.
**Cohen's *d* was used as the measure of effect size.
***Indicates statistical significance.

Figure 2

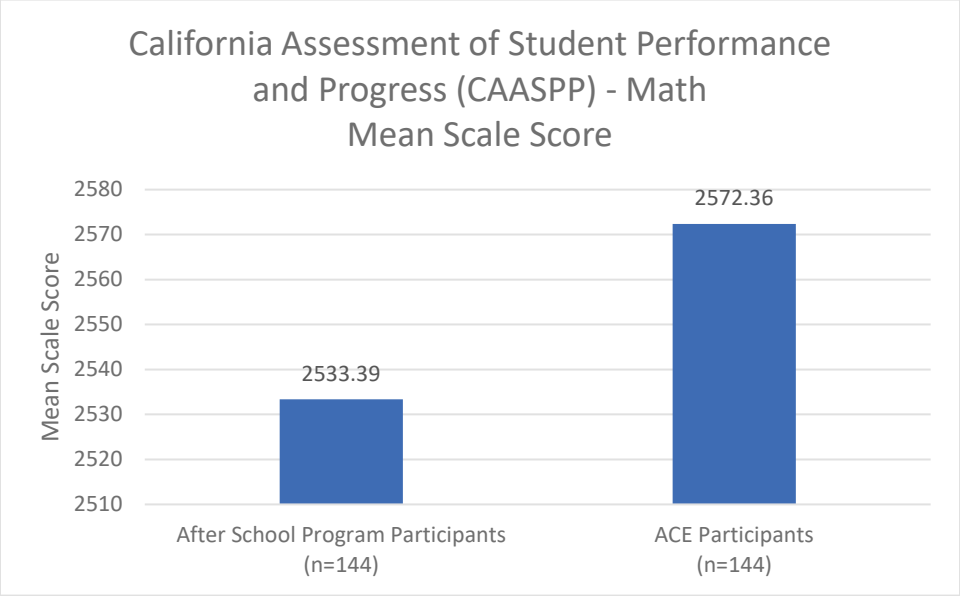
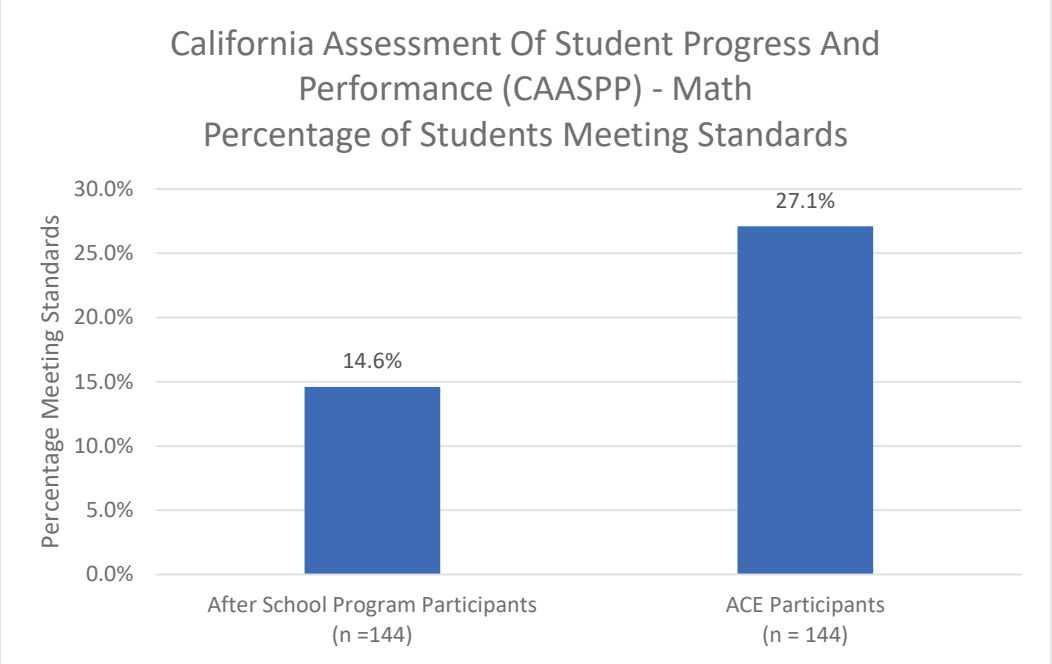


Figure 3 shows that in 2015-16, the percentage of ACE participants who met or exceeded standards on the CAASPP in math (27.1%) was 12.5% higher than the percentage of matched controls (14.6%) who were participants in the general after school program, but did not participate in ACE.

Figure 3




## Conclusion

**Findings provide quasi-experimental evidence that participation in the ACE Program has a positive impact on earning credits towards graduation and achievement in math.** Positive differences found for ACE participant outcomes when compared with students who attended after-school programs with similar frequency are especially noteworthy. Students who voluntarily participate in an after-school program are more likely to be on track for better prosocial development than those who do not,[1] which increases their likelihood of favorable academic and school-related outcomes.[2] In addition, these findings provide evidence that participating in the ACE Program results in a greater or additional impact when compared to participating in a variety of other after-school interventions.

[1] Gottfredson, D. C., Cross, A. B., & Soule, D. A. (2007). Distinguishing characteristics of effective and ineffective after-school programs to prevent delinquency and victimization. Criminology & Public Policy, 6(2), 289-318. doi:10.1111/j.1745-9133.2007.00437.x

[2] Jones, S. M., & Bouffard, S. M. (2012). Social policy report: Social and emotional learning in schools: From programs to strategies. Sharing Child and Youth Development Knowledge, 26(4). Retrieved from http://files.eric.ed.gov/fulltext/ ED540203.pdf

## About ERC

Established in 1999, ERC is a consulting firm experienced in program development, evaluation and research for school districts, county offices of education, community colleges and universities. Evaluation and reporting experience includes programs funded through federal, state and private sources. ERC evaluates after-school programs at more than 400 school sites, operated by Fresno, Tulare, Kings and San Diego county offices of education; and, Los Angeles, San Diego, Santa Ana, Clovis, Madera, Sanger Unified School Districts, and Merced Union High School District. ERC's lead evaluator, Stephen Price, has a doctorate in educational leadership, is experienced in experimental and quasi-experimental designs, data analysis using a variety of statistical software programs such as SPSS and HLM, survey construction, facilitation of focus groups, program observation, and interpretation of evaluation results for a broad spectrum of audiences.