

## **Investigating the Benefits of Arts Education: An Experimental Evaluation of Houston's Arts Access Initiative**

### Background

An increasingly popular strategy for addressing inequities in K-12 arts educational opportunities is the formation and development of school-community arts partnerships, where arts organizations partner with campuses to support and enhance the provision of arts educational experiences (Bowen & Kisida, 2017). As with arts education research in general, there is limited research on the impacts of these partnerships (Catterall & Waldorf, 1999; Rowe, Castaneda, Kaganoff, & Robyn, 2004). Preliminary evidence suggests that these partnerships improve academic achievement and attainment (Winner & Cooper, 2000). However, experimental studies are needed to enforce causal claims. Houston's Arts Access Initiative (AAI) was launched in 2013. This multi-sector, collective-action effort aimed to ensure "that every student in Houston will have the opportunity to benefit cognitively, creatively, emotionally, and academically through the arts."

### Research Questions

In collaboration with AAI stakeholders, our research team developed the following questions to assess the Initiative in terms of its impacts on student outcomes:

- Does a substantial increase in arts-based learning opportunities, provided through school-community partnerships, improve K-8 student-school engagement, in terms of attendance, self-reported school engagement, and reductions in disciplinary infractions?
- Do these opportunities increase students' desire to engage and participate in the arts?
- Does the Initiative facilitate academic achievement gains in terms of standardized test scores?
- Does the AAI foster and facilitate social learning skills, specifically in the forms of tolerance, empathy, and civic obligation?
- Are there heterogeneous effects in outcomes across student subgroups?

### Setting

The AAI was designed as a district-wide delayed rollout program with elementary and middle schools in the Houston Independent School District (HISD). The primary focus in the first few years of implementation was serving elementary schools with the lowest levels of arts educational resources. Eighty-one HISD elementary and middle school campuses applied to

participate in the AAI in its pilot phase, but, as a phased rollout plan, only 25 schools would be able to initially participate. The AAI was designed to eventually serve all schools that wanted to participate, but initial participation was restricted in order for administrators to refine implementation prior to district-wide expansion.

### Population

The analytical sample for this study consists of 10,548 4<sup>th</sup>-8<sup>th</sup> grade students attending the 42 evaluation schools (21 randomly assigned treatment, 21 control). Four schools were automatically selected to participate in the AAI and were excluded from this evaluation. Student demographics, prior measures of achievement, and prior attendance and discipline, by school-treatment status, are provided in table 1.

### Intervention

School-level participation in the AAI was optional, and in order to be considered, principals were required to contractually commit to the mission of the Initiative; engage in “Strategic Arts Planning” with the Initiative’s executive director; assign an AAI liaison to facilitate program-related efforts; engage in principal and teacher arts integration professional development sessions; and commit to a budget between \$1 to \$10 per student for providing students with arts learning experiences. A private foundation provided a match for the school’s financial commitment. Including matching funds, AAI schools had an average budget of \$14.67 per student to facilitate and enhance their partnerships with arts organizations and institutions.

In the first year of implementation, AAI schools, on average, formed an additional 5.24 partnerships with arts organizations and institutions. The AAI executive director assisted with guiding principals’ decisions regarding arts program selection, but the school principal ultimately had the final say on their Strategic Arts Plan. While the general notion of schools committing to and receiving substantial increases in arts learning experiences through arts partnerships was consistent across AAI treatment schools, campus-level implementation varied, by design, substantially.

### Research Design

With demand for AAI program participation initially exceeding supply, we were able to conduct a school-level, clustered RCT. Due to the sample size limitation of only 42 campuses participating in the AAI evaluation during its first two years, school applicants were paired, prior

to randomization, according to grade levels served, student demographics, baseline arts resources, and prior school-level achievement.

### Data Collection and Analysis

Student-level administrative data were obtained from HISD records, which provides a rich set of data pertaining to demographics, school attendance and enrollment records, state standardized assessment scores, and disciplinary records. In addition to administrative data, we collaborated with HISD to collect original survey data that we have linked to student-level administrative data. The grade levels for survey participation were restricted to students enrolled in STAAR-tested grades.

The experimental design of this evaluation provides a straightforward analytical strategy. We estimate the AAI average treatment effects with a two-staged least squares regression model, where the proportion of a student's school year attending an AAI school is predicted by the randomly assigned treatment to estimate local average treatment effects on our outcomes of interest.

### Results

We find that increasing arts learning opportunities significantly reduces the proportion of students receiving disciplinary infractions, significantly increases writing test score achievement, improves student-school engagement, and promotes their desire to help others. We do not find any statistically significant effects pertaining to other student attendance, non-writing test score achievement, or any of our other survey-based measures. We also find that these effects varied substantially by student subgroups. Elementary school students and students from historically-underserved subgroups, particularly students receiving "limited English proficiency" (LEP) services, appear to benefit the most from these arts learning experiences. See tables 2-4 for results.

### Conclusions

These results suggest that substantial increases in arts access produce significant, multifaceted educational benefits for students. While there are limitations with regard to our ability to attribute these effects to particular components or types of arts educational offerings, or to generalize our findings beyond our sample, we believe that this study significantly advances the limited research we have to date on the causal impacts of arts learning opportunities on students' educational outcomes. We believe these findings can help to inform policy discussion

regarding the role and value of the arts in K-12 education and will help spur further discussion and investigation of the mechanisms responsible and necessary for improving arts educational offerings.

## References

- Bowen, D. H., & Kisida, B. (2017). The art of partnerships: Community resources for arts education. *Phi Delta Kappan*, 98(7), 8-14.
- Catterall, J., & Waldorf, L. (1999). Chicago arts partnerships in education: Summary evaluation. *Champions of change: The impact of the arts on learning*, 47-62.
- Rowe, M., Werber, L., Kaganoff, T., & Robyn, A. (2004). *Arts education partnerships*. Santa Monica, CA: RAND Corporation.
- Winner, E., & Cooper, M. (2000). Mute those claims: No evidence (yet) for a causal link between arts study and academic achievement. *Journal of Aesthetic Education*, 34(3/4), 11-75.

Table 1

*Descriptive Statistics by Treatment Status*

Variable	Treatment	Control	Difference
Grade Level	5.594 (0.287)	5.701 (0.274)	-0.107 (0.396)
Female	0.486 (0.006)	0.489 (0.008)	-0.003 (0.010)
<u>FRL Status:</u>			
Not FRL	0.136 (0.023)	0.134 (0.020)	0.002 (0.031)
Free Lunch Eligible	0.301 (0.017)	0.289 (0.021)	0.013 (0.027)
Reduced Lunch Eligible	0.074 (0.007)	0.070 (0.007)	0.004 (0.010)
Poverty	0.489 (0.030)	0.508 (0.022)	-0.019 (0.037)
<u>Race/Ethnicity:</u>			
African-American	0.232 (0.043)	0.243 (0.045)	-0.010 (0.062)
Hispanic/Latinx	0.708 (0.046)	0.701 (0.044)	0.007 (0.064)
White	0.027 (0.010)	0.029 (0.012)	-0.003 (0.015)
Special Education (SPED)	0.060 (0.005)	0.068 (0.009)	-0.008 (0.009)
Limited English Proficiency (LEP)	0.302 (0.038)	0.283 (0.030)	0.019 (0.048)
Baseline Reading (standardized)	0.054 (0.071)	-0.128 (0.048)	0.182** (0.085)
Baseline Math (standardized)	0.018 (0.067)	-0.076 (0.057)	0.094 (0.088)
Baseline Core GPA	82.03 (0.679)	81.59 (0.588)	0.444 (0.896)
Prior Year Disciplinary Infraction	0.081 (0.019)	0.123 (0.027)	-0.042 (0.033)
Baseline Absences	4.695 (0.318)	5.389 (0.397)	-0.694 (0.507)
<b>Sample Size</b>	<b>5,333</b>	<b>5,215</b>	<b>10,548</b>

Note: \*\*\* statistically significant (two-tailed) at  $p < 0.01$ ; \*\* significant at  $p < 0.05$ ; \*  $p < 0.10$ ; standard errors in parentheses adjusted for school-grade clustering. When “baseline” is specified for time-sensitive academic achievement, it is for 2014-15 for the first cohort and 2015-16 for the second cohort. Test scores standardized relative to the rest of HISD with a mean of zero and standard deviation of one.

Table 2

*First Year Administrative and Survey Results – ITT and ATE*

Outcome	N	ITT (s.e.)	1 <sup>st</sup> Stage (s.e.)	2SLS (s.e.)
Disciplinary Infraction	10,548	-0.036** (0.015)	0.961*** (0.003)	-0.038** (0.015)
Absences	10,548	0.061 (0.128)	0.961*** (0.003)	0.063 (0.132)
Math (4 <sup>th</sup> -8 <sup>th</sup> )	10,130	0.014 (0.063)	0.977*** (0.002)	0.014 (0.064)
Reading (4 <sup>th</sup> -8 <sup>th</sup> )	10,140	-0.046 (0.065)	0.977*** (0.002)	-0.020 (0.020)
Science (5 <sup>th</sup> and 8 <sup>th</sup> )	4,063	-0.046 (0.065)	0.975*** (0.003)	-0.047 (0.065)
Writing (4 <sup>th</sup> and 7 <sup>th</sup> )	4,352	0.127*** (0.046)	0.977*** (0.003)	0.130*** (0.046)
School Engagement	6,325	0.093* (0.051)	0.987*** (0.002)	0.095* (0.051)
College Aspiration	6,311	0.015 (0.018)	0.987*** (0.002)	0.015 (0.018)
Arts-Facilitated Empathy	6,249	0.039 (0.036)	0.987*** (0.002)	0.039 (0.036)
Help Others	6,290	0.080** (0.032)	0.987*** (0.002)	0.081** (0.033)
Tolerance	6,299	-0.004 (0.036)	0.987*** (0.002)	-0.004 (0.036)
Cultural Learning	6,316	0.037 (0.039)	0.987*** (0.002)	0.038 (0.039)
Cultural Consumption	6,241	0.030 (0.036)	0.987*** (0.002)	0.030 (0.036)
Arts Transfer Disposition	6,259	0.054 (0.038)	0.987*** (0.002)	0.055 (0.038)
Value the Arts	6,285	0.060 (0.043)	0.987*** (0.002)	0.061 (0.043)

Note: Differences are statistically significant with a two-tailed, null hypothesis test where \*  $p < 0.10$ , \*\*  $p < 0.05$ , and \*\*\*  $p < 0.01$ . Standard errors are in parentheses and have been clustered at the school-grade level. Test scores are standardized with a mean of zero and a standard deviation of one.

Table 3

*Administrative Data-Derived Outcomes by Subgroup*

Population	N	Discipl.	Absences	Math	Reading	Science	Writing
Overall	4,063- 10,548	-0.038** (0.015)	0.063 (0.132)	0.014 (0.064)	-0.020 (0.020)	-0.047 (0.065)	0.130*** (0.046)
Elementary	2,547-5,565	-0.002 (0.007)	0.201 (0.141)	0.014 (0.043)	-0.030 (0.032)	0.010 (0.050)	0.184*** (0.065)
Middle	1,516-4,983	-0.075*** (0.028)	-0.091 (0.211)	-0.006 (0.120)	-0.009 (0.021)	-0.147 (0.124)	0.030 (0.021)
Female	2,009-5,140	-0.021 (0.012)	0.247* (0.146)	0.019 (0.071)	-0.021 (0.022)	-0.023 (0.068)	0.140*** (0.047)
Male	2,054-5,408	-0.055*** (0.020)	-0.104 (0.183)	0.011 (0.058)	-0.019 (0.021)	-0.064 (0.066)	0.108** (0.050)
Af.-Amer.	950-2,503	-0.053*** (0.016)	-0.295 (0.322)	0.061 (0.046)	-0.064* (0.036)	0.064 (0.059)	0.032 (0.064)
Hisp-Latx.	2,856-7,436	-0.036** (0.018)	0.134 (0.151)	-0.016 (0.073)	-0.012 (0.022)	-0.066 (0.073)	0.136** (0.057)
Not FRL	602-1,421	-0.061*** (0.022)	0.581** (0.225)	0.088 (0.082)	0.051 (0.044)	-0.084 (0.132)	0.231** (0.114)
FRL	1,485-3,875	-0.028** (0.013)	0.115 (0.119)	-0.027 (0.088)	-0.031 (0.021)	-0.074 (0.073)	0.127** (0.057)
Poverty	1,975-5,255	-0.041** (0.018)	-0.081 (0.181)	0.021 (0.046)	-0.032 (0.026)	-0.007 (0.050)	0.096** (0.042)
LEP	1,110-3,089	-0.023 (0.017)	-0.082 (0.189)	-0.031 (0.057)	-0.026 (0.031)	0.007 (0.061)	0.271*** (0.100)
GT	731-1,927	-0.014 (0.010)	0.130 (0.150)	0.213 (0.166)	0.048 (0.035)	0.005 (0.147)	0.178* (0.092)

Note: Differences are statistically significant with a two-tailed, null hypothesis test where \*  $p < 0.10$ , \*\*  $p < 0.05$ , and \*\*\*  $p < 0.01$ . Standard errors are in parentheses and have been clustered at the school-grade level. Test scores are standardized with a mean of zero and a standard deviation of one.



Table 4

*Survey Data-Derived Outcomes by Subgroup*

Population	N	School Engage.	College Aspiration	Arts Empathy	Help Others	Tolerance	Cultural Learning	Cultural Consump.	Arts Trans. Disp.	Value the Arts
Overall	6,241-6,325	0.095* (0.051)	0.015 (0.018)	0.039 (0.036)	0.081** (0.033)	-0.004 (0.036)	0.038 (0.039)	0.030 (0.036)	0.055 (0.038)	0.061 (0.043)
Pre-Post	3,511-3,625	0.158*** (0.048)	0.058** (0.023)	0.052 (0.047)	0.115*** (0.036)	0.007 (0.043)	N/A	0.046 (0.044)	0.043 (0.051)	0.028 (0.046)
Elementary	3,613-3,660	0.266*** (0.057)	0.071** (0.021)	0.099** (0.048)	0.153*** (0.039)	0.042 (0.041)	0.139*** (0.045)	0.075 (0.050)	0.080* (0.047)	0.058 (0.055)
Middle	2,628-2,665	-0.136*** (0.045)	-0.053*** (0.018)	-0.022 (0.044)	0.010 (0.047)	-0.050 (0.062)	-0.103** (0.045)	-0.005 (0.038)	0.031 (0.055)	0.087 (0.062)
Female	3,152-3,185	0.122** (0.058)	0.020 (0.020)	0.070 (0.044)	0.060 (0.040)	-0.012 (0.043)	0.062 (0.043)	0.051 (0.041)	0.049 (0.051)	0.049 (0.049)
Male	3,093-3,140	0.068 (0.053)	0.008 (0.023)	-0.004 (0.042)	0.095** (0.042)	-0.003 (0.041)	0.009 (0.043)	-0.004 (0.049)	0.055 (0.039)	0.063 (0.045)
Af.-Amer.	1,444-1,472	0.148** (0.069)	-0.039* (0.023)	-0.048 (0.058)	0.047 (0.041)	-0.112 (0.068)	-0.012 (0.060)	0.030 (0.055)	0.070 (0.063)	0.024 (0.066)
Hispanic-Latx.	4,333-4,386	0.066 (0.055)	0.042** (0.022)	0.050 (0.038)	0.090** (0.043)	0.010 (0.040)	0.031 (0.044)	0.028 (0.043)	0.026 (0.035)	0.050 (0.038)
Not FRL	840-848	0.164 (0.072)	-0.031 (0.035)	0.079 (0.113)	0.093 (0.062)	-0.012 (0.067)	0.059 (0.099)	0.034 (0.078)	0.116 (0.100)	0.218* (0.113)
FRL	2,345-2,381	0.079 (0.060)	0.025 (0.025)	0.069 (0.045)	0.095** (0.048)	-0.007 (0.046)	-0.009 (0.043)	0.043 (0.044)	0.074 (0.050)	0.097* (0.056)
Poverty	3,058-3,098	0.087 (0.056)	0.022 (0.018)	-0.008 (0.039)	0.063* (0.038)	0.001 (0.044)	0.065 (0.049)	0.012 (0.041)	0.010 (0.039)	-0.022 (0.039)
LEP	1,970-1,993	0.210*** (0.072)	0.102*** (0.024)	0.135** (0.058)	0.225*** (0.056)	0.042 (0.048)	0.130** (0.051)	0.167** (0.066)	0.139** (0.061)	0.117** (0.056)
GT	1,265-1,281	0.160** (0.073)	0.043 (0.027)	0.204*** (0.069)	0.236*** (0.046)	0.138*** (0.050)	0.084 (0.060)	0.094* (0.055)	0.179*** (0.065)	0.248*** (0.072)

Note: Differences are statistically significant with a two-tailed, null hypothesis test where \*  $p < 0.10$ , \*\*  $p < 0.05$ , and \*\*\*  $p < 0.01$ . Standard errors are in parentheses and have been clustered at the school-grade level. The pre-post analysis is restricted to AAI cohort 2 schools and includes student-level baseline measures. Questions pertaining to cultural learning were not collected during the fall survey administration; therefore, there this outcome lacks a baseline measure.