



A Call for Jacksonville Employers to Embrace STEAM

Why should you support arts education? Because it is the difference-maker. For the underserved, STEM graduates and top executives alike, arts education makes the difference and paves the way for socioeconomic success.

(1) AN ECONOMY IN NEED OF SOME STEAM

Very few of us would disagree that the economy and job-creation are among the most pressing matters of our time. While employment numbers are gradually improving, “millions of Americans remain out of work or underemployed as the economic recovery continues slowly.”ⁱ Job creation and preparation of a workforce with the skills to undertake those 21st-century jobs unquestionably remain paramount concerns.

The Jacksonville Chamber of Commerce believes that science, technology, engineering and math or S.T.E.M.-related careers and the skills to work them “are key to Northeast Florida and the nation’s future and competitiveness—so important that 80 percent of jobs in the future will be STEM-related.”ⁱⁱ In response to this, the JAX Chamber has recently made great efforts to attract and foster “technology-driven start-up companies,” in particular.ⁱⁱⁱ

Despite this focus on STEM jobs as the key to economic prosperity,^{iv} Northeast Florida has struggled to “increase the number of people skilled in STEM fields.”^v In fact, “even while job vacancies in these fields rise,” we have found it a challenge to find workers with the skills to fill them locally.^{vi}

Additionally, as Jacksonville labors to “create high-tech jobs” and to attract entrepreneurs, it must address the fact that it ranks 83rd out of the 100 largest metropolitan areas in the country in terms of the number of patents its residents obtained.^{vii}

If we want to go forward in Northeast Florida, how do we do it?



(2) THE ROUTE TO ECONOMIC RECOVERY: FOSTERING CREATIVITY AND INNOVATION

According to *Tough Choices or Tough Times: The Report of the New Commission on the Skills of the American Workforce*, a study by the National Center on Education and the Economy, “creativity and innovation” are at the top of the list of those qualities that “may spell the difference between success and failure for the students who will grow up to be the workers of 21st century.”^{viii}

As a white paper produced by the Lincoln Center Institute reports, “Corporate employers agree.”^{ix} Summarizing the results of a 2010 IBM study of 1,500 global “CEOs, general managers, and public sector leaders,” Lincoln Center proclaims the “jolting discovery: these executives believe that competing in today’s complex economy requires, more than any other single quality, creativity.”^x

A 2013 report prepared by the Americans for the Arts, in conjunction with Vans Custom Culture, confirmed this opinion. When asked to describe what was needed to succeed at work, “72% of business leaders [said] that creativity is the number one skill they [were] seeking when hiring.”^{xi}

Most professional Americans have a similar viewpoint. In October 2012, Adobe Systems Incorporated, the multinational diversified computer software company, polled 1,000 college-educated, full-time salaried Americans 25 years of age or older and found that 89% of them believe that “creativity is required for economic growth.”^{xii} Moreover, asked to consider how important creativity actually is in their current professional career in relation to how important they thought creativity might have been to future jobs while they were in college, 78% contended that it was more important now, while only 57% considered creativity important in college.^{xiii}

Despite the repeated assertion of the link between creativity and innovation, on the one hand, and economic and professional success, on the other, employers continually find prospective applicants woefully lacking in these critical skills. The Conference Board, Corporate Voices for Working Families, the Partnership for 21st Century Skills, and the Society for Human Resource Management reported that “[o]ut of hundreds of managers across the country, 73.6% think the skill of creativity/innovation will increase in importance in coming years, but only 21.5% rate new job entrants with four-year college diplomas as ‘excellent’ in this area.”^{xiv}

How then do we generate these missing skills and put some steam back into the economic engine?



(3) ADDING ARTS TO S.T.E.M. TO GIVE IT S.T.E.A.M.

We do it through arts education—fine arts, music, dance, and theatre. We develop innovation, critical thinking, and creativity by adding an “A” to S.T.E.M. and giving it “S.T.E.A.M.”

A Michigan State University study of Honors College STEM graduates published in April 2013 asserts that in order for the “country to reinvent itself out of the recent economic crisis, [it] must attend to the role of arts and crafts as incubators and generators of innovative and creative capacity.”^{xv} Postulating that, given the current economy, “the goal is to raise jobs,” they argue this simple equation as the solution: “STEM + Arts and Crafts = Innovators → Jobs.”^{xvi}

The National Governors Association reached a similar conclusion. In its study on the *New Engines for Growth*, it lays out “the role that arts, culture, and design can play in assisting states as they seek to create jobs and boost their economies in the short run and transition to an innovation-based economy in the long run. In particular, arts, culture, and design can assist states with economic growth because they can: 1. Provide a fast-growth, dynamic industry cluster; 2. Help mature industries become more competitive; 3. Provide the critical ingredients for innovative places; 4. Catalyze community revitalization; and 5. Deliver a better-prepared workforce.”^{xvii}

It is clear: STEM needs to become STEAM (science, technology, engineering, *arts* and math). Only with robust arts education that fosters “the interplay between left-brain convergent thinking and right-brain divergent thinking”^{xviii} and promotes the “creative and critical thinking that supports collaborative learning”^{xix} can we involve the whole child and create well-rounded global citizens “who have the imagination and skills to conquer new challenges.”^{xx} Arts education is the difference maker, putting steam in the STEM engine and not only providing the skills this century’s job-seekers need to succeed, but also enabling individuals to rise further than might have been possible without it.

(4) FUELING FORTUNE 1000 EXECUTIVES

Take music education as an example. In 2008, Harris Interactive conducted a study on the childhood music education of 150 senior executives of Fortune 1000 companies who ranked as a VP or higher. Of these, 110—or 80%—had music education.^{xxi} 73% of those “were involved in some type of music



program while in school.”^{xxii} Plus, they were “more likely to have stayed in music education programs longer than the general public.”

The results were equally compelling atop the corporate ladder: “When looking specifically at the ‘C Suite,’ the top executives of companies, 43 percent had participated in music education programs for more than 5 years, compared to only 19 percent of the general population. Eighty-five percent felt music education has influenced their sense of personal fulfillment, while only 69 percent of the general population feels this way.”^{xxiii}

77% of these global executives “recommend their children get involved in music education at their schools.”^{xxiv} Why? 72% of them “feel music education equips people to be better team players in their careers and 71 percent feel music education provides you with a disciplined approach to problem solving.”^{xxv}

Perhaps most significantly, “[c]umulatively, the longer that executives participated in classroom music programs, the more successful they became in life.”^{xxvi}

(5) GREATER ART, GREATER EDUCATION, GREATER INCOME

Indeed, while art may be seen as secondary and mere entertainment by some, it is in fact the key to important skills like creative and critical problem solving and a primary pathway to higher education and income.^{xxvii}

Another Harris Interactive poll linked participation in music education with both “lifelong educational attainment and higher income.”^{xxviii}

The survey of 2,565 adults found a compelling association between music education and higher income: 83% of those with an income of \$150,000 or more participated in music, while, in comparison, only 72% of those with incomes between \$35,000 and \$49,999 did.^{xxix}

Those who had primary and/or secondary school music experience also tended to continue their education longer and later and to reach greater degree levels. The Harris poll showed that 88% of those with post-graduate education surveyed had participated in music education while in school.^{xxx} 86% of those with a college education participated in music in comparison to 81% who had only some college education and 65% who had a high school education or less.^{xxxi}

However, music education isn’t the only art that may lead to increased levels of higher education. The arts in general—fine arts, dance, theatre, and music—tend to form a basis for greater levels of



higher education. According to *The Arts and Achievement in At-Risk Youth: Findings from Four Longitudinal Studies*, the percent of young adults who “ever attended college after high school” is 71% with high general arts involvement versus 48% with low arts involvement.^{xxxii}

(6) SCORING BIG: ARTS EDUCATION AND SUCCESS K-12

Given the disparity in terms of academic and economic success between those who have arts education and those who don’t, we might ask how arts education makes that difference? The answer is simple: arts education promotes greater success in grades K-12 and helps lay an exponentially stronger foundation for the skills needed to succeed in school and in the developing 21st century economy.

Numerous studies nation-wide point to six major categories in which an arts education fosters greater success and more robust skillsets:

(1) Students with arts education experience have higher levels of academic achievement.^{xxxiii}

- 4 times more likely to be recognized for academic achievement^{xxxiv};
- 4 times more likely to participate in a math and science fair^{xxxv};
- In a 2010 study cited by the President’s Committee on the Arts and the Humanities, Dallas’ Big Thought program “found that sustained engagement in a fine arts discipline gave high school students a substantial advantage in reading achievement when compared to students who took fewer arts courses, and that all students who participated in clubs or groups that focused on creative activities had an advantage in reading and math achievement.”^{xxxvi}
- Moving beyond the suggestion of “correlations” between arts education and the development of successful academic and social skillsets, a 2013 study undertaken by the University of Arkansas and Rice University in conjunction with the Crystal Bridges Museum of American Art in Bentonville, Arkansas establishes that “strong causal relationships do in fact exist between arts education” and “stronger critical thinking skills,” “higher levels of social tolerance,” “greater historical empathy,” and “a taste for art museums and cultural institutions.”^{xxxvii}

(2) Students with arts education experience have higher critical reading and math SAT scores.

- On average, students who take four years or arts or music classes score between 50 and 100 points higher on the math, critical reading, and writing sections of the SAT than those who take a half-year or less of arts education.^{xxxviii}



- (3) Students with arts education experience have better school attendance.
- 3 times more likely to win an award for school attendance.^{xxxix}
- (4) Students with arts education experience have more pro-social behavior.^{xl}
- Voluntarism and political participation are stronger;
 - “3 times more likely to be elected to class office.”^{xli}
- (5) Students with arts education experience have higher levels of college attendance.^{xlii}
- (6) Students with arts education experience have increasingly higher levels of attainment into the future.
- The benefits of arts experience are not limited to a student’s time in school. They actually compound over time. Summarizing James Catterall’s 2009 findings in *Reinvesting in Arts Education: Winning America’s Future Through Creative School*, the President’s Committee on the Arts and the Humanities explains, “The advantages in performance of the arts-involved students relative to other students have increased over time.”^{xliii}

Closer to home, in 2009, Florida State University’s Dr. Steven N. Kelly analyzed Florida Department of Education (FDE) data on “all 12th grade public school students graduating in the 2007-2008 academic year.”^{xliv} Looking at the data on students in arts-related classes in comparison to students not enrolled in arts classes, Kelly found that the “data demonstrated a strong relationship between individuals who participated in school arts experiences and higher academic success as demonstrated by grade point averages, scores on the Florida Comprehensive Assessment Test (FCAT) and math and verbal portions of the SAT exam.”^{xlv}

Repeating a similar analysis of data provided by FDE for the 2010-2011 academic year, Kelly confirmed the earlier findings. In summary, Kelly’s analysis of FDE data on graduating 12th graders reveals, “across socioeconomic factors and race categories,” the following:

- (1) K-12 arts education clearly contributes “to the overall academic success of Florida public school students” because the data shows that students “benefit academically and socially from participation” in arts classes,^{xlvi}
- (2) Students who take arts classes in school have greater academic success than those who do not.^{xlvii} We see this measurement of academic success in two areas:



- (a) First, students who participate in arts education are more likely to do better in academic areas such as math, reading, and writing and have stronger GPAs.^{xlviii}
- (b) Second, students who participate in arts education are more likely to earn higher scores on the SAT and the Florida Comprehensive Assessment Test.^{xlix} Indeed, regardless of socioeconomic status or race, students enrolled in arts classes scored higher overall on the FCAT and the SAT than those not enrolled.¹
 - (i) Students with arts education are more likely to take the SAT.^{li}
 - (ii) The more arts education, the more SAT math and verbal scores improve.^{lii}
 - (iii) Underrepresented and at-risk students with significant arts education score higher on the math and verbal sections of the SAT than do students who receive no arts instruction.^{liii}
- (3) Students with arts education have a higher graduation rate than those without an arts education.^{liv}
- (4) Arts education reduces dropout rates because students in art classes are more likely to stay in school.^{lv}
- (5) Long-term, sustained exposure to arts education generates the greatest success, but even a modicum of arts education fosters success more than none. Some is better than none.^{lvi}
- (6) That said, a substantial amount of arts education yields significantly greater results than none, suggesting that the effects of arts education are magnified exponentially the more one acquires.^{lvii}
- (7) Arts don't just benefit the gifted students, but all students—from high-performing STEM majors to the underserved and challenged.^{lviii}

(8) STEAM RISES: THE ARTS CULTIVATE STEM SUCCESS

In 2013, Michigan State University released the results of a study of MSU Honors College science and technology graduates from 1990-1995. The study focused on “the role arts education and training may play in stimulating the professional inventiveness of technology workers and entrepreneurs” or “the role that arts may play in stimulating, nurturing, or creating creative capacity among inventors and entrepreneurs as measured by such critical economic development indicators as patents generated or businesses formed particularly among (science, technology, engineering, and math) STEM majors.”^{lix}

The report put forth “four striking results: (a) graduates majoring in *science, technology, engineering, and mathematics* (STEM) subjects are far more likely to have extensive arts and crafts skills than the



average American; (b) arts and crafts experiences are significantly correlated with producing patentable inventions and founding new companies; (c) the majority believe that their innovative ability is stimulated by their arts and crafts knowledge; and (d) lifelong participation and exposure in the arts and crafts yields the most significant impacts for innovators and entrepreneurs.”^{lx}

MSU compared the exposure to arts lessons or classes of their STEM subjects to that of “the average arts experiences of American adults.”^{lxi} “As a group,” the authors indicate, “these STEM professionals participate in arts and crafts at a much higher rate than does the average American.”^{lxii} The results were shocking. 93% of STEM graduates reported music lessons or classes in contrast to only 34% of the general adult population; 79.1% of STEM graduates reported visual arts lessons or classes in contrast to only 17% of the general adult population; 44.2% of STEM graduates reported acting lessons or classes in contrast to only 5.9% of the general adult population; 51.2% of STEM graduates reported music lessons or classes in contrast to only 12.1% of the general adult population.^{lxiii}

In addition to the rate of arts exposure as a differentiating factor between successful entrepreneurial STEM graduates and the general adult population, those STEM graduates with more varied arts education outpaced their STEM peers with less in terms of having the most entrepreneurial spirit. The MSU study states: “Yet even within this group of highly successful individuals, exposure to a wide variety of arts and crafts differentiated the most entrepreneurial individuals from the rest.”^{lxiv} They continue: “In general, STEM Honors College graduates who have founded companies or produced patents have higher than average participation in some arts and many crafts than do STEM Honors College graduates who have not found [sic] companies or patented inventions.”^{lxv} For instance, those STEM majors who participated in photography as children have 29.9% more patents than those who didn’t.^{lxvi} Those who did some kind of architecture as children have started 97.5% more companies than those who didn’t have that kind of experience.^{lxvii}

MSU concluded “that a very strong case can be made that arts and crafts training correlates significantly with success as a scientist or engineer and that this success can be measured in economically valuable predicts such as patentable inventions and the founding of new companies.”^{lxviii}

Rather than “extras” that can be dispensed with when faced with budget shortages, then, “disposing of arts and crafts may have negative consequences for the country’s ability to produce innovative scientists and engineers who invent patentable products and found new companies.”^{lxix}



If one of the economic challenges Jacksonville has faced is providing highly-skilled labor to companies who may wish to develop business here, then the arts clearly make a difference, forging the skills needed for long-term success and bolstering greater critical abilities, innovation, creativity, and the entrepreneurial spirit.

(9) ARTING UP THE UNDERSERVED

Given the importance of critical thinking skills in a creative information and innovation economy, as well as the challenges presented by unequal access to a quality education, arts education and exposure becomes a difference-maker. While the entire group of students in the Crystal Bridges study improved their critical thinking skills—“observing, interpreting, evaluating, associating, problem finding, comparing, and flexible thinking”^{lxx}—by 9%, the “benefit for disadvantaged groups is considerably larger.”^{lxxi} For instance, rural students “experience an increase in critical-thinking skills of” 33%, while minority students and those from high-poverty schools, where more than 50% of students enrolled receive free or reduced-price lunches, show an 18% improvement in critical thinking about art.^{lxxii} In fact, the Crystal Bridges study indicates that the benefits of arts exposure and education may be greatest for those in rural and high-poverty schools: rural students had a 13% increase and high-poverty students had a 9% increase in tolerance in comparison with a 7% an increase in tolerance for all students in the study.

These findings echo those of the well-known studies spearheaded by Catterall: *The Arts and Achievement in At-Risk Youth: Findings from Four Longitudinal Studies* (2012) and *Doing Well and Doing Good by Doing Art* (2009). Unlike the Crystal Bridges study, however, Catterall’s studies focus not only on accomplishment in *primary and secondary school*, but also on *college and beyond*—looking at what the primary and secondary school subjects went on to accomplish by their mid-twenties. For our purposes, Catterall’s work demonstrates the clearly identifiable advantages of an arts-rich education to a student with a low socioeconomic status (or low SES) in four primary areas: secondary school academic achievement, college attainment and attendance, employment and income, and citizenry.^{lxxiii}

Catterall finds that arts education can make a significant difference for low SES students in comparison to other low SES students without arts education. In *The Arts and Achievement in At-Risk Youth*, Catterall, Susan A. Dumais and Gillian Hampden-Thompson explain: “Teenagers and young adults of low socioeconomic status (SES) who have a history of in-depth arts involvement show better academic outcomes than do low-SES youth who have less arts involvement.” They “earn better grades” and have “higher overall GPAs than did students who lacked those



experiences.^{lxxiv} Moreover, low SES students “who took arts courses in high school achieved a slightly higher grade-point average (GPA) in math than did other students” and were more likely to have completed a higher-level math course such as calculus than those with little or no arts experience.^{lxxv}

Comparing the performance of low SES students with high arts and low arts involvement and at arts-rich and arts-poor high schools, Catterall found compellingly higher rates of enrollment at a college or 4-yr post-secondary institution with low SES students who had arts education.^{lxxvi}

	% Ever Attended College After High School	% Ever Attended a 4-Year Post-Secondary Institution
Low SES in an Arts-Rich School	78.7 ^{lxxvii}	48.9 ^{lxxviii}
Low SES with High Arts Involvement	70.7 ^{lxxix}	38.7 ^{lxxx}
Low SES in an Arts-Poor School	67.1 ^{lxxxi}	33.2 ^{lxxxii}
All Low SES Students	59.3 ^{lxxxiii}	26.9 ^{lxxxiv}

The nearly 20% difference in higher education attendance between low SES students in arts-rich schools and the average low SES student is also echoed in the number and kind of degree earned. Low SES students in arts rich high schools had 38.8% AA, 25% BA, 2.6% MA degrees earned compared to 20.9% AA, 11.7% BA, 0.8% MA in arts poor high schools.^{lxxxv}

As we found earlier when discussing the correlation between higher education and income and arts education, those of Catterall’s subjects who had arts education and experience appear to have—or believe that they have had—more professional and economic success.

Low SES with	Full-Time Job	Feel Education Has Led to Better Job	Feel Education Has Led to Higher Pay	Feel Education Has Led to More Responsibility	Feel Education Has Led to Promotion Opportunity
Arts-Rich School	75.7 ^{lxxxvi}	58.2 ^{lxxxvii}	53.4 ^{lxxxviii}	59 ^{lxxxix}	54.1 ^{xc}
High Arts Involvement	75.1 ^{xc}	50.7 ^{xcii}	45.2 ^{xciii}	54.5 ^{xciv}	48.1 ^{xcv}
Arts-Poor School	74.2 ^{xcvi}	43.5 ^{xcvii}	39.7 ^{xcviii}	47 ^{xcix}	40.5 ^c
All Low SES	69.4 ^{ci}	41.2 ^{cii}	37 ^{ciii}	42.6 ^{civ}	38.1 ^{cv}

Beyond the real and perceived advantages of both an arts education and of an education in an arts-rich environment, Catterall finds that the arts can bring under-performing, underserved students to at least near the average. For instance, 79.1% of all students ever attended college after high school, and 78.7% of low SES students in arts rich high schools ever attended college after high school, compared to 67.1% in arts poor high schools.^{cv} When one considers the 13% gap between the average student and a low SES student at an arts poor high school in comparison to the 0.4% gap between the average student and a low SES student at an arts-rich high school, one witnesses the difference arts education can make in helping the underserved achieve stronger results. Furthermore, more than the approximately 6% higher rate of full-time employment low SES students with strong arts education have than their peers without arts experience, those with arts education value education more than their peers and believe it has helped them succeed professionally and economically.

Finally, Catterall found that “arts-engaged low-income students are more likely than their non-arts-engaged peers” to have “volunteered in their communities and participated in the political process by voting.”^{cvii} In this, Catterall stresses how important arts education is in helping to create actively engaged, well-rounded students who grow to be multi-faceted, productive citizens.

Here in Jacksonville, the parents of some of our most underserved recognize the importance of the arts as a part of a well-rounded education and a pathway to success: “Of those respondents who chose the ‘Whole Child’ strategic plan focus area as their top priority, the most important specific initiative to take in that area across African American, Caucasian, and Latino or Hispanic respondents was ‘Increase participation in arts, physical education and elective courses’.”^{cviii} They understand what has been proven statewide and nationwide: arts education helps low socioeconomic status students to succeed more. For our most underserved, arts education is the difference maker.

But neither the benefits of nor the desire for arts education is limited to one segment of the population. “Of the district’s strategic priority areas, ‘Focus on providing a well-rounded education that includes art, music, physical education and health services’ was most important to parents of DCPS students.”^{cix} Indeed, arts education does not simply benefit everyone. It is one of the rare equalizing factors across the socioeconomic racial spectrum. As we have seen, everyone from the top CEOs and STEM entrepreneurs to the underrepresented and underserved do better when S.T.E.M. becomes S.T.E.A.M.



Given the undeniably powerful role arts education plays in fostering success amongst our most needy, in helping our most gifted reach or exceed their potential, and in nurturing the whole child and student who becomes the well-rounded citizen with the skills necessary to succeed in a challenging 21st-century global economy, it is regretful that “the state of Florida is one of five that does not require elementary schools to offer any instruction in the arts at all” and whose requirement for middle and high school are not much stronger.^{cx} We’re lucky, then, that after an X-year^{cx} hiatus, Superintended Vitti and the DCPS School Board have placed over 100 new music and visual arts teachers back in the classroom; when you add to this that the Cathedral Arts Project has brought the Kennedy Center’s Any Given Child program to Jacksonville in order to help ensure equitable access to a quality arts education for *all* Northeast Florida students, then things are certainly looking up. However, the work has only begun. What can you do to help make arts education a long-term reality, help Jacksonville reach its social and economic promise, and guarantee that our children have a bright 21st century ahead of them? Contact JAX Chamber or the Cathedral Arts Project for information on how you can get involved in and advocate for arts education in our community.

ⁱ The Brookings Institute. “Job Creation.” Retrieved from <http://www.brookings.edu/research/topics/jobs>.

ⁱⁱ JAX Chamber. “Workforce Development and Education.” Retrieved from http://www.myjaxchamber.com/index.php?submenu=workforce_development&src=gendocs&ref=workforcedevelopment&category=_about. Although I do not note it above, it is important to remember that JAX Chamber has actually formed a *STEM* taskforce to address this problem: “Through collaboration with area employers, colleges and universities via our STEM Task Force and outreach to high school students, college students and their parents, we seek to increase the number of people skilled in STEM fields.” If one considers all the research cited in this paper, JAX Chamber would be better off forming a *STEAM* taskforce.

ⁱⁱⁱ Bauerlein, David. “UNF seeks to tap research for job-creating potential.” *Florida Times-Union*. Posted July 12, 2013. Retrieved from <http://jacksonville.com/news/metro/2013-07-13/story/unf-seeks-tap-research-job-creating-potential>. The story says: “JAX Chamber has been trying to develop a stronger roster of technology-driven start-up companies. ‘This is an area where I believe there’s a lot of opportunity,’ JAX Chamber President Daniel Davis said. ‘We’ve seen younger entrepreneurs come up with great ideas and grow them into major companies. We believe we can do the same thing locally.’”

^{iv} The idea is that STEM jobs are seen as the key, but we don’t have the people to fill them; we don’t have the people with the skills, so we need to train them.

^v JAX Chamber. “Workforce Development and Education.” Retrieved from http://www.myjaxchamber.com/index.php?submenu=workforce_development&src=gendocs&ref=workforcedevelopment&category=_about.

^{vi} JAX Chamber. “Workforce Development and Education.” Retrieved from http://www.myjaxchamber.com/index.php?submenu=workforce_development&src=gendocs&ref=workforcedevelopment&category=_about.

^{vii} Bauerlein, David. “UNF seeks to tap research for job-creating potential.” *Florida Times-Union*. Posted July 12, 2013. Retrieved from <http://jacksonville.com/news/metro/2013-07-13/story/unf-seeks-tap-research-job-creating-potential>.



The story says: “The ultimate goal is to create high-tech jobs here in Jacksonville,’ said Jerry Merkel, director of the Innovation Program in the College of Computing, Engineering and Construction. It won’t be easy. Out of the 100 largest metropolitan areas in the country, Jacksonville ranks 83rd in the number of patents its residents obtained, according to a report released last month by the Brookings Institute, a Washington, D.C., think tank.”

^{viii} National Center on Education and the Economy (2007). *Tough Choices or Tough Times: The Report of the New Commission on the Skills of the American Workforce: The Report of the New Commission on the Skills of the American Workforce. Executive Summary*. Retrieved from http://www.helios.org/uploads/docs/ToughChoices_EXECSUM.pdf. 14. The text from which this is taken reads: “On balance, they [tests] are designed to measure the acquisition of discipline-based knowledge in the core subjects in the curriculum, but, more often than not, little or nothing is done to measure many of the other qualities that we have suggested may spell the difference between success and failure for the students who will grow up to be the workers of 21st century America: creativity and innovation, facility with the use of ideas and abstractions, the self-discipline and organization needed to manage one’s work and drive it through to a successful conclusion, the ability to function well as a member of a team, and so on.”

^{ix} Noppe-Brandon, Scott, Deasy, Richard J., and Gitter, Cary (2011). *Findings of the Imagination Conversations: The Lessons of a Two-Year National Initiative*. New York: Lincoln Center Institute. 2.

^x Noppe-Brandon, Scott, Deasy, Richard J., and Gitter, Cary (2011). *Findings of the Imagination Conversations: The Lessons of a Two-Year National Initiative*. New York: Lincoln Center Institute. 2. “In May 2010, IBM released the results of its fourth biennial Global CEO Study, which interviewed over 1,500 CEOs, general managers, and public sector leaders. The jolting discovery: these executives believe that competing in today’s complex economy requires, more than any other single quality, creativity.”

^{xi} Americans for the Arts and Vans Custom Culture (2013). *Arts Education Navigator: Facts & Figures*. Washington D.C.: Americans for the Arts. 5.

^{xii} Adobe Systems Incorporated (2012). *Creativity and Education: Why It Matters*. 9. This survey polled 1,000 American ages 25+ “who are college-educated and full-time (salaried) employees” (3).

^{xiii} Adobe Systems Incorporated (2012). *Creativity and Education: Why It Matters*. 9. “Creativity is more important than now [in career] than most professionals believed it would be in college: 78% Importance of Creativity NOW; 57% while in college.”

^{xiv} Noppe-Brandon, Scott, Deasy, Richard J., and Gitter, Cary (2011). *Findings of the Imagination Conversations: The Lessons of a Two-Year National Initiative*. New York: Lincoln Center Institute. 2.

^{xv} LaMore, Rex, Root-Bernstein, Robert, Root-Bernstein, Michele, Schweitzer, John H., Lawton, James, L., Roraback, Eileen, Peruski, Amber, VanDyke, Megan, and Fernandez, Laleah (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 228.

^{xvi} LaMore et al. (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 228.

^{xvii} National Governors Association Center for Best Practices (2012). *New Engines of Growth: Five Roles for Arts, Culture and Design*. Washington D.C.: National Governors Association. 1.

^{xviii} SteamConnect. “What Is Ste[+a]m?” Retrieved from <http://steamconnect.org/steam/>. “The +a in STE[+a]M integrates arts with STEM (science, technology, engineering and math) education sparking the interplay between left-brain convergent thinking and right-brain divergent thinking. In a rapidly changing world, we all must become well-rounded global citizens who have the imagination and skills to conquer new challenges. STE+aM is the catalyst for this.”

^{xix} The Kennedy Center (2013). “Growing from STEM to STEAM: Tips to team up the arts and sciences in your classroom.” *Arts Edge*. Retrieved from <http://artsedge.kennedy-center.org/educators/how-to/growing-from-stem-to-steam.aspx>.

^{xx} SteamConnect (2013). “What Is Ste[+a]m?” Retrieved from <http://steamconnect.org/steam/>. “The +a in STE[+a]M integrates arts with STEM (science, technology, engineering and math) education sparking the interplay between left-brain convergent thinking and right-brain divergent thinking. In a rapidly changing world, we all must become well-



rounded global citizens who have the imagination and skills to conquer new challenges. STE+aM is the catalyst for this.” <http://steamconnect.org/steam/>. Accessed 23 December 2013.

^{xxi} National Association for Music Education (2008). “New Study Links Music Education and Business Executive Advancement.” Retrieved from <http://pressrelated.com/press-release-grammys-offer-opportunity-to-highlight-music-education.html>. “Harris Interactive conducted the study by telephone within the United States in the fall of 2007 among 150 senior executives in Fortune 1000 companies. These executives were VP and higher and 110 of these had music education.”

^{xxii} “Executives of Top Fortune 1000 Companies Were Involved in Music in School.” Retrieved from <http://www.bandofpride.com/uploads/6/6/2/4/6624580/benefit.pdf>.

^{xxiii} National Association for Music Education (2008). “New Study Links Music Education and Business Executive Advancement.” Retrieved from <http://pressrelated.com/press-release-grammys-offer-opportunity-to-highlight-music-education.html>. I am fully aware that these results are not “causal” but rather “corollary” and “associative.” Indeed, these sorts of studies and assertions open themselves to the kind of criticism shored up against studies citing the influence of arts education that we find repeatedly monthly. See, for instance, “Music and Success” by Samuel Mehr. The article, which the *New York Times* released on-line on December 20 and then printed on December 22, 2013, asserts the [tiresome] argument: “.On the basis of such evidence, you might assume that music education helped cause such positive outcomes. That is a misguided assumption. Correlation does not imply causation. These associations do not establish, as many people believe, that music makes you smarter.” The problem with the notion of causation vs. correlation touted by and relied upon by so many “scientists” is that it is, from a philosophical standpoint, equally as unexamined as the correlations they are arguing against. That is, from ancient Greek philosophy to that of the end of the 20th century, philosophers have repeatedly asserted the difficulty—if not impossibility—of *actually* proving causation; causation is itself an associative or relational philosophical leap. That the charge of “association,” “relationality,” and “correlation” is most continually leveled at studies having to do with the arts, rather than, say, science education—how to prove, for example, that all that high school chemistry was actually caused you to do better academically?—is more a symptom than it is a scientifically accurate assessment.

^{xxiv} “Executives of Top Fortune 1000 Companies Were Involved in Music in School.” Retrieved from <http://www.bandofpride.com/uploads/6/6/2/4/6624580/benefit.pdf>.

^{xxv} National Association for Music Education (2008). “New Study Links Music Education and Business Executive Advancement.” Retrieved from <http://pressrelated.com/press-release-grammys-offer-opportunity-to-highlight-music-education.html>.

^{xxvi} “Executives of Top Fortune 1000 Companies Were Involved in Music in School.” Retrieved from <http://www.bandofpride.com/uploads/6/6/2/4/6624580/benefit.pdf>. Accessed 12.10.13.

^{xxvii} See the Harris Interactive study (“Those with More Education and Higher Household Incomes are More Likely to Have Had Music Education: Music Education Influences Level of Personal Fulfillment for Many U.S. Adults”), of which this is a paraphrase. “ROCHESTER, N.Y. – November 12, 2007 – Whether it’s chorus, band or just violin lessons, music impacts Americans’ lives. While singing in a chorus or playing an instrument is fun, it can also provide important skills like creative problem solving that can help lead to higher education and incomes as well as personal fulfillment.”

^{xxviii} National Association for Music Education (2007). “Harris Poll Links Music Education to Advanced Studies and Higher Incomes.” Retrieved from <http://musiced.nafme.org/resources/harris-poll-links-music-education-to-higher-incomes/>. Accessed 12.10.13. “Harris Interactive released an independent poll which shows a positive association of music with lifelong educational attainment and higher income. Nearly nine in ten people (88 percent) with post graduate degrees participated in music education. Further, 83 percent of those with incomes higher than \$150,000 or more participated in music.”

^{xxix} Harris Interactive (2007). “Those with More Education and Higher Household Incomes are More Likely to Have Had Music Education.” The Harris Poll® #112, November 12, 2007. 1. “Three-quarters of people (74%) with household incomes



of \$34,999 or less and 72 percent of those with incomes of \$35,000-\$49,999 participated in music, compared to 83 percent of those with incomes of \$150,000 or more.”

xxx Harris Interactive (2007). “Those with More Education and Higher Household Incomes are More Likely to Have Had Music Education.” The Harris Poll® #112, November 12, 2007. 1. “Two-thirds (65%) of those with a high school education or less participated in music compared to four in five (81%) with some college education and 86 percent of those with a college education. The largest group to participate in music, however, are those with a post graduate education as almost nine in ten (88%) of this group participated while in school.”

xxxii Harris Interactive (2007). “Those with More Education and Higher Household Incomes are More Likely to Have Had Music Education.” The Harris Poll® #112, November 12, 2007. 1. “Two-thirds (65%) of those with a high school education or less participated in music compared to four in five (81%) with some college education and 86 percent of those with a college education.”

xxxiii Catterall, James S, Dumais, Susan A., Hampdon-Thompson, Gillian (2012). *The Arts and Achievement in At-Risk Youth: Findings from Four Longitudinal Studies*. Washington, D. C.: National Endowment for the Arts, Research Report #55. Retrieved from <http://www.nea.gov/research/arts-at-risk-youth.pdf>. 11.

xxxiii Cf. Americans for the Arts and Vans Custom Culture (2013). *Arts Education Navigator: Facts & Figures*. Washington D.C.: Americans for the Arts. 5, 9. (This info actually comes from another study, which is referenced and cited on page 9: Brice Heath, S. (1998). *Living the Arts through Language + Learning: A Report on Community-Based Youth Organizations*. Americans for the Arts Monograph, 2 (7).: “Students who are involved in the arts are: 4 times more likely to participate in a math and science fair; 3 times more likely to win an award for school attendance; 4 times more likely to be recognized for academic achievement; 3 times more likely to be elected to class office.” Cf. also Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009.i: “Intensive involvement in the arts during middle and high school associates with higher levels of achievement and college attainment, and also with many indications of pro-social behavior such as voluntarism and political participation.”

xxxiv Americans for the Arts and Vans Custom Culture (2013). *Arts Education Navigator: Facts & Figures*. Washington D.C.: Americans for the Arts. 5, 9. Although this information was cited twice in the aforementioned study, it actually comes from another study, which is referenced and cited on page 9: Brice Heath, S. (1998). *Living the Arts through Language + Learning: A Report on Community-Based Youth Organizations*. Americans for the Arts Monograph, 2 (7).

xxxv Americans for the Arts and Vans Custom Culture (2013). *Arts Education Navigator: Facts & Figures*. Washington D.C.: Americans for the Arts. 5, 9. Although this information was cited twice in the aforementioned study, it actually comes from another study, which is referenced and cited on page 9: Brice Heath, S. (1998). *Living the Arts through Language + Learning: A Report on Community-Based Youth Organizations*. Americans for the Arts Monograph, 2 (7).

xxxvi President’s Committee on the Arts and the Humanities (2011). *Reinvesting in Arts Education: Winning America’s Future Through Creative Schools*. Washington, DC: President’s Committee on the Arts and Humanities. 19. They cite (Bransom et al., 2010).

xxxvii Kisida, Brian, Greene, Jay, and Bowen, Daniel H. “Art Makes You Smart.” *New York Times*. 11.24.2013. Please note that the authors of this *Times* article are indeed the authors of the study.

xxxviii The stat I originally found stated that the difference was “almost 100 points”: “Students who take four years of arts and music classes average almost 100 points better on their SAT scores than students who take only one-half year or less.” Americans for the Arts and Vans Custom Culture (2013). *Arts Education Navigator: Facts & Figures*. Washington D.C.: Americans for the Arts. 8. That study did note, however, that this information comes from another source: The College Board. (2011). *College-Bound Seniors: Total Group Profile Report*. Retrieved from http://professionals.collegeboard.com/profdownload/cbs2011_total_group_report.pdf. When I checked that report, I did not see on page 9 in Table 18, which is the table that shows the figures for arts and music study by number of years and SAT score, a 100 point spread; rather it was 50-60. I am putting the larger span in my text in case I am reading this wrong.



^{xxxix} Americans for the Arts and Vans Custom Culture (2013). *Arts Education Navigator: Facts & Figures*. Washington D.C.: Americans for the Arts. 5, 9. Although this information was cited twice in the aforementioned study, it actually comes from another study, which is referenced and cited on page 9: Brice Heath, S. (1998). *Living the Arts through Language + Learning: A Report on Community-Based Youth Organizations*. Americans for the Arts Monograph, 2 (7).

^{xl} Catterall, James S. (2009). *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. i. "Intensive involvement in the arts during middle and high school associates with higher levels of achievement and college attainment, and also with many indications of pro-social behavior such as voluntarism and political participation."

^{xli} Americans for the Arts and Vans Custom Culture (2013). *Arts Education Navigator: Facts & Figures*. Washington D.C.: Americans for the Arts. 5, 9. Although this information was cited twice in the aforementioned study, it actually comes from another study, which is referenced and cited on page 9: Brice Heath, S. (1998). *Living the Arts through Language + Learning: A Report on Community-Based Youth Organizations*. Americans for the Arts Monograph, 2 (7).

^{xlii} Catterall, James S. (2009). *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. i. "Intensive involvement in the arts during middle and high school associates with higher levels of achievement and college attainment, and also with many indications of pro-social behavior such as voluntarism and political participation."

^{xliii} President's Committee on the Arts and the Humanities (2011). *Reinvesting in Arts Education: Winning America's Future Through Creative Schools*. Washington, D.C.: President's Committee on the Arts and the Humanities. 18.

^{xliv} Kelly, Steven N. (2012, October). "A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction's Influence on Academic Success." Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 8.

^{xlv} Kelly, Steven N. (2012, October). "A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction's Influence on Academic Success." Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 8.

^{xlvi} Kelly, Steven N. (2012, October). "A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction's Influence on Academic Success." Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 8. "The addition of the 2010-2011 data continues to provide a comprehensive pattern of influence that K-12 arts education experiences contribute to the overall academic success of Florida public school students. Clearly all students continue to benefit academically and socially from participation."

^{xlvii} Kelly, Steven N. (2012, October). "A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction's Influence on Academic Success." Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 8. A "strong relationship between individuals who participate in school arts classes and higher academic success" from "Results of the new data analysis reflect findings from the 2007-2008 analysis by showing a continued strong relationship between individuals who participate in school arts classes and higher academic success. The new findings continue to demonstrate that success is not limited only to students participating in arts-related classes over long periods of time, but that students enrolling in a minimal number of arts experiences also benefit more than students not enrolling in any arts classes. However, there continues to be a significantly greater difference between students enrolling in four or more credits of arts and individuals not enrolling in any arts-related classes. This difference extends across socioeconomic factors and race categories. There are also strong indicators that students enrolling in arts classes have a higher graduation rate than students not enrolling in these classes. Consequently, participation in arts classes appears to increase the likelihood that students will stay in school, thus reducing school dropout rates."

^{xlviii} Center for Fine Arts Education [Florida]. *Cohort Study of Arts Participation and Academic Performance*. PowerPoint presentation. Retrieved from <http://cfaefl.org/dnn/Advocacy.aspx>. See slide 5. If one looks at the data assembled in the study and at this slide, the way this conclusion is drawn is by looking at GPA of both Bright Futures students and non-Bright Futures students in terms of four categories: 0 credits of arts education; 0.5-1; 1.5-2; 2.5-3; 4 or more credits of



visual art, dance, theater, and music. As one reads from 0 to 4 or more, the GPAs tend to rise; that is, the GPAs of the students in each category (visual arts, dance, theater, and music) are noticeably and markedly higher at 4 or more credits than they are at 0 credits. (Note, the introductory slide includes notes that read: “This paper describes an analysis of data from two different academic years of 12th grade public school student populations from the state of Florida. The study includes Information from the 2007-08 Cohort study based on 188,859 12th Grade Students Information from the 2010-2011 Cohort Based on 197,932 12th Grade students The analysis was conducted by Dr. Steven Kelly from Florida State University.” It also notes : “This paper describes an analysis of data from two different academic years of 12th grade public school student populations from the state of Florida. The analysis provides evidence that all students participating in arts-related classes: 1) stay in school; 2) have higher graduation rates; 3) perform higher in academic areas such as math, reading and writing; and 4) achieve higher scores on standardized tests such as the SAT and the Florida Comprehensive Assessment Test. The analysis is not an indicator of causation but of relationships.”)

^{xlix} Center for Fine Arts Education [Florida]. Cohort Study of Arts Participation and Academic Performance. PowerPoint presentation. Retrieved from <http://cfaefl.org/dnn/Advocacy.aspx>. See slides 50 and 51. In a manner similar to the result having to do with greater academic success and GPA, if one looks at, for instance, the data assembled in the study on FCAT Math scores, the way this conclusion is drawn is by looking at two things: the first slide (slide 50) looks at the “Percentage of Students Statewide Scoring 3 or Above on FCAT Math.” For students taking visual arts, dance, music, and theater, it looks at the percentage of students in each category who score a 3 or above on the Math section of the FCAT based on having taken 0 credits; 0.5-1; 1.5-2; 2.5-3; 4 or more credits. As one reads from 0 to 4 or more, the percentage of students scoring a 3 or more rises by basically 20%. That is, the number of students in each category (visual arts, dance, theater, and music) who score a 3 or more on the math FCAT is noticeably and markedly higher at 4 or more credits than at 0 credits of arts education. The second slide (slide 51) cross-references this by looking, in a similar fashion, at students who earned only a 1 or 2 on the Math section of the FCAT. There, the percentage of students earning these lower grades rises (with some deviation) as the number of arts credits gets fewer (moves from 4 to 0). That is, the percentage of students doing poorly on the Math FCAT rises the fewer arts classes they have.

ⁱ “Furthermore, a comparison of students scoring at Level 3 or better on all FCAT sections to students scoring at Level 1 or 2 demonstrate continued benefits of the arts for all students. Data comparing free/reduced lunch and race reflect the overall comparisons regarding FCAT scores and benefits.” Kelly, Steven N. (2012, October). “A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction’s Influence on Academic Success.” Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 10.

ⁱⁱ Kelly, Steven N. (2012, October). “A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction’s Influence on Academic Success.” Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 9. “Overall, there are more 12th grade students enrolled in arts-related classes taking the SAT”—and this increase in taking the SAT by those in arts classes includes “both free/reduced lunch and race categories,” which also show “increases.”

ⁱⁱⁱ Kelly, Steven N. (2012, October). “A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction’s Influence on Academic Success.” Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 9. “Overall SAT scores for both math and verbal exams continue to show a trend that SAT scores improve as students take more arts-related credits.”

^{liii} Kelly, Steven N. (2012, October). “A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction’s Influence on Academic Success.” Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 9. Free/reduced lunch students and minority students enrolled in four or more credit hours of arts classes “scored higher on math and verbal portions of the SAT than students receiving no arts instructions.”

^{liv} Kelly, Steven N. (2012, October). “A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction’s Influence on Academic Success.” Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 8. “students enrolling in arts classes have a higher graduation rate than students not enrolling in these classes” from “Results of the new data analysis reflect findings from the 2007-2008 analysis by



showing a continued strong relationship between individuals who participate in school arts classes and higher academic success. The new findings continue to demonstrate that success is not limited only to students participating in arts-related classes over long periods of time, but that students enrolling in a minimal number of arts experiences also benefit more than students not enrolling in any arts classes. However, there continues to be a significantly greater difference between students enrolling in four or more credits of arts and individuals not enrolling in any arts-related classes. This difference extends across socioeconomic factors and race categories. There are also strong indicators that students enrolling in arts classes have a higher graduation rate than students not enrolling in these classes. Consequently, participation in arts classes appears to increase the likelihood that students will stay in school, thus reducing school dropout rates.”

^{lv} Kelly, Steven N. (2012, October). “A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction’s Influence on Academic Success.” Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 8. “participation in arts classes appears to increase the likelihood that students will stay in school, thus reducing school dropout rates.” from “Results of the new data analysis reflect findings from the 2007-2008 analysis by showing a continued strong relationship between individuals who participate in school arts classes and higher academic success. The new findings continue to demonstrate that success is not limited only to students participating in arts-related classes over long periods of time, but that students enrolling in a minimal number of arts experiences also benefit more than students not enrolling in any arts classes. However, there continues to be a significantly greater difference between students enrolling in four or more credits of arts and individuals not enrolling in any arts-related classes. This difference extends across socioeconomic factors and race categories. There are also strong indicators that students enrolling in arts classes have a higher graduation rate than students not enrolling in these classes. Consequently, participation in arts classes appears to increase the likelihood that students will stay in school, thus reducing school dropout rates.”

^{lvi} Kelly, Steven N. (2012, October). “A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction’s Influence on Academic Success.” Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 8. “success is not limited only to students participating in arts-related classes over long periods of time, but that students enrolling in a minimal number of arts experiences also benefit more than students not enrolling in any arts classes” from “Results of the new data analysis reflect findings from the 2007-2008 analysis by showing a continued strong relationship between individuals who participate in school arts classes and higher academic success. The new findings continue to demonstrate that success is not limited only to students participating in arts-related classes over long periods of time, but that students enrolling in a minimal number of arts experiences also benefit more than students not enrolling in any arts classes. However, there continues to be a significantly greater difference between students enrolling in four or more credits of arts and individuals not enrolling in any arts-related classes. This difference extends across socioeconomic factors and race categories. There are also strong indicators that students enrolling in arts classes have a higher graduation rate than students not enrolling in these classes. Consequently, participation in arts classes appears to increase the likelihood that students will stay in school, thus reducing school dropout rates.”

^{lvii} Kelly, Steven N. (2012, October). “A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction’s Influence on Academic Success.” Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 8. “a significantly greater difference between students enrolling in four or more credits of arts and individuals not enrolling in any arts-related classes” from “Results of the new data analysis reflect findings from the 2007-2008 analysis by showing a continued strong relationship between individuals who participate in school arts classes and higher academic success. The new findings continue to demonstrate that success is not limited only to students participating in arts-related classes over long periods of time, but that students enrolling in a minimal number of arts experiences also benefit more than students not enrolling in any arts classes. However, there continues to be a significantly greater difference between students enrolling in four or more credits of arts and individuals not enrolling in any arts-related classes. This difference extends across socioeconomic factors and race categories. There are also strong

indicators that students enrolling in arts classes have a higher graduation rate than students not enrolling in these classes. Consequently, participation in arts classes appears to increase the likelihood that students will stay in school, thus reducing school dropout rates.”

^{lviii} Kelly, Steven N. (2012, October). “A Comparison of Cohort Data From 2007-2008 to 2010-2011 Regarding Fine Arts-Related Instruction’s Influence on Academic Success.” Retrieved from <http://cfaefl.org/dnn/Portals/cfae/advocacy/2010-2011%20Cohort%20Study.pdf>. 9.

^{lix} LaMore et al. (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 222-223.

^{lx} LaMore et al. (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 221.

^{lxi} LaMore et al. (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 226. The average American adults base is given by an NEA study, according to LaMore.

^{lxii} LaMore et al. (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 227-228.

^{lxiii} LaMore et al. (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 226.

^{lxiv} LaMore et al. (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 227-228.

^{lxv} LaMore et al. (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 224.

^{lxvi} LaMore et al. (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 224.

^{lxvii} LaMore et al. (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 224. Those stats are all found on this page, along with many others.

^{lxviii} LaMore et al. (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 227-228.

^{lxix} LaMore et al. (2013). “Arts and Crafts: Critical to Economic Innovation.” *Economic Development Quarterly*. August 2013, vol. 27 no. 3 221-229. Sage Publications. 221.

^{lxx} Note: together these form the “seven-item rubric for measuring critical thinking that was developed by researchers at the Isabella Stewart Gardner Museum in Boston.” Greene, Jay. Brian Kisida. and Daniel H. Bowen. “The Educational Value of Field Trips.” *Education Next*. Winter 2014/Vol. 14, No. 1. Stanford (journal), Harvard (web). Retrieved from <http://educationnext.org/the-educational-value-of-field-trips/>.

^{lxxi} Note: together these form the “seven-item rubric for measuring critical thinking that was developed by researchers at the Isabella Stewart Gardner Museum in Boston.” Greene, Jay. Brian Kisida. and Daniel H. Bowen. “The Educational Value of Field Trips.” *Education Next*. Winter 2014/Vol. 14, No. 1. Stanford (journal), Harvard (web). Retrieved from <http://educationnext.org/the-educational-value-of-field-trips/>.

^{lxxii} Greene, Jay. Brian Kisida. and Daniel H. Bowen. “The Educational Value of Field Trips.” *Education Next*. Winter 2014/Vol. 14, No. 1. Stanford (journal), Harvard (web). Retrieved from <http://educationnext.org/the-educational-value-of-field-trips/>.

^{lxxiii} Cf. President’s Committee on the Arts and the Humanities (2011). *Reinvesting in Arts Education: Winning America’s Future Through Creative Schools*. Washington, D.C.: President’s Committee on the Arts and the Humanities. 18.

^{lxxiv} Catterall, James S, Dumais, Susan A, Hampdon-Thompson, Gillian (2012). *The Arts and Achievement in At-Risk Youth: Findings from Four Longitudinal Studies*. Washington, D. C.: National Endowment for the Arts, Research Report #55. Retrieved from <http://www.nea.gov/research/arts-at-risk-youth.pdf>. 12, 13.



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- ^{lxxv} Catterall, James S, Dumais, Susan A., Hampdon-Thompson, Gillian (2012). *The Arts and Achievement in At-Risk Youth: Findings from Four Longitudinal Studies*. Washington, D. C.: National Endowment for the Arts, Research Report #55. Retrieved from <http://www.nea.gov/research/arts-at-risk-youth.pdf>. 13.
- ^{lxxvi} Catterall, James S, Dumais, Susan A., Hampdon-Thompson, Gillian (2012). *The Arts and Achievement in At-Risk Youth: Findings from Four Longitudinal Studies*. Washington, D. C.: National Endowment for the Arts, Research Report #55. Retrieved from <http://www.nea.gov/research/arts-at-risk-youth.pdf>. 12. “Teenagers and young adults of low socioeconomic status (SES) who have a history of in-depth arts involvement . . . demonstrate higher rates of college enrollment and attainment.”
- ^{lxxvii} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
- ^{lxxviii} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
- ^{lxxix} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 69.
- ^{lxxx} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 69.
- ^{lxxxi} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
- ^{lxxxii} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
- ^{lxxxiii} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 69.
- ^{lxxxiv} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 69.
- ^{lxxxv} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
- ^{lxxxvi} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
- ^{lxxxvii} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
- ^{lxxxviii} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
- ^{lxxxix} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
- ^{xc} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
- ^{xci} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 69.
- ^{xcii} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 69.
- ^{xciii} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 69.
- ^{xciv} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 69.
- ^{xcv} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 69.



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- ^{xcvi} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
- ^{xcvii} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
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- ^{cii} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 69.
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- ^{cvi} Catterall, James S. *Doing Well and Doing Good by Doing Art*. Los Angeles/London: Imagination Group/I-Group Books, 2009. 113.
- ^{cvi} President's Committee on the Arts and the Humanities (2011). *Reinvesting in Arts Education: Winning America's Future Through Creative Schools*. Washington, D.C.: President's Committee on the Arts and the Humanities. 18.
- ^{cvi} 2013 Education Poll: Arts Education Highlights. Random telephone poll conducted by UNF October 2013, including mobile. Provided by Tina Worth.
- ^{cix} 2013 Education Poll: Arts Education Highlights. Random telephone poll conducted by UNF October 2013, including mobile. Provided by Tina Worth.
- ^{cx} See Kimberly Hyatt's letter in the December 2013 Cathedral Arts Project newsletter: "The state of Florida is one of five that does not require elementary schools to offer any instruction in the arts at all, and, frankly, the requirements are not much stronger for middle and high schools."
- ^{cx} I don't know when the arts were cut from DCPS curriculum at the elementary school level.