



LEARN WITH US

## IMPACT STUDY

*the* EFFECTS *of* FACILITATED SINGLE-VISIT ART  
MUSEUM PROGRAMS *on* STUDENTS GRADES 4-6



### SUMMARY & DISCUSSION

*Prepared for the*  
National Art Education Association &  
Association of Art Museum Directors

# TABLE OF CONTENTS

<b>ACKNOWLEDGEMENTS .....</b>	<b>3</b>
<b>ABSTRACT .....</b>	<b>4</b>
<b>STUDY MOTIVATIONS.....</b>	<b>6</b>
<b>RESEARCH DESIGN .....</b>	<b>7</b>
STUDENT CAPACITIES.....	7
METHODOLOGY.....	12
MUSEUM SELECTION.....	16
SCHOOL SELECTION.....	17
<b>PROGRAM OBSERVATION FINDINGS .....</b>	<b>18</b>
<b>STUDENT IMPACT FINDINGS .....</b>	<b>21</b>
QUESTIONING .....	22
MULTIPLE INTERPRETATIONS .....	24
PHYSICALITY OF ART .....	26
EMOTIVE RECALL .....	28
<b>IMPLICATIONS .....</b>	<b>31</b>
<b>REFERENCES.....</b>	<b>32</b>
<b>NOTE TO READERS.....</b>	<b>35</b>

\*Cover photo taken by Amanda Krantz at the Orlando Museum of Art

# ACKNOWLEDGEMENTS

An immense thank you to the many individuals whose contributions have made the National Art Education Association (NAEA) & Association of Art Museum Directors (AAMD) Impact of Art Museums on Students research initiative possible. A study of this scope truly takes a village.

## FUNDERS

Institute of Museum and Library Services (IMLS) ■ Samuel H. Kress Foundation

## NAEA CORE TEAM

Barbara Bassett ■ Juline Chevalier ■ Jennifer Czajkowski ■ Andy Finch ■ Michelle Grohe ■ Melissa Higgins-Linder ■ Emily Holtrop ■ Meghan Pennisi ■ Deborah Reeve ■ Wendy Wolf

## AAMD CORE TEAM

Christine Anagnos ■ Andy Finch

## STUDY ADVISORS

Angela Fischer ■ George Hein ■ Jennifer Novak-Leonard ■ Danielle Rice ■ Sree Sreenivasan

## MUSEUM PARTNERS

Columbus Museum of Art, including: Sonia Bazan ■ Cindy M. Foley ■ Amanda Kepner ■ Jen Lehe  
Hammer Museum, including: Tara Burns ■ Olivia Fales ■ Theresa Sotto  
Museum of Fine Arts, Houston, including: Jennifer Berardino ■ Caroline Goeser ■ Claire Johnson  
Orlando Museum of Art, including: Jane Ferry ■ Jude Goodier-Mojher  
Rhode Island School of Design Museum, including: Sarah Ganz Blythe ■ Mariani Lefas-Tetenes  
Walters Art Museum, including: Amanda Kodeck ■ Brittany Powell

## LOCAL DATA COLLECTORS

Lauren Archer ■ Mandi Barringer ■ Kathy Brown ■ Dillon Caldwell ■ Kerra Carson ■ Tuni Chatterji ■  
Brittany Collier-Gibson ■ TaShanda Dennison ■ Josephine Devanbu ■ Orianna Duncan ■ Gricelda  
Espinoza ■ Hanna Exel ■ Marjorie Freggens ■ Lynette Gilbert ■ Laura Gilchrest ■ Leona Houston ■  
Raul Iglesias ■ Krishna Johnson ■ Ryan Kapa ■ Anna Kebler ■ Nicole Lawson ■ Tiffany Lee ■ Rachel  
Marino ■ Patrick Mayne ■ Brigid McCaffrey ■ Lindsay McCord ■ Christy Nittrouer ■ Cara North ■ Bryn  
Pernot ■ Michael Rzemien ■ Tyler Vanburen ■ Nathanael Vlachos ■ Sharon Watkins ■ Lauren Wilson

## CRITICAL READERS & OTHER CONTRIBUTORS

Ben Garcia ■ Anne Henderson ■ Olga Hubbard ■ Emily K. D. Jennings ■ Brian Kisida ■ Dana Carlisle  
Kletchka ■ Anne Kraybill ■ Lynn Pearson Russell ■ Marissa Reyes ■ Patricia Moore Shaffer ■ Stacey  
Shelut-Hendrick ■ Matt Sikora ■ Jacqueline Terrassa

Sincerely,

RK&A

Stephanie Downey, Randi Korn, Amanda Krantz;

Katie Chandler, Erin Wilcox, Emily Skidmore, & Sam Theriault

## ABSTRACT

Spearheaded by the Museum Education Division of the National Art Education Association (NAEA) and the Association of Art Museum Directors (AAMD) with funding from the Institute of Museum and Library Services (IMLS) and the Samuel H. Kress Foundation, RK&A conducted a national study of the effects of facilitated single-visit art museum programs on students in grades 4-6. The results of this study are critical. Facilitated single-visit programs are the most common way art museums serve K-12 students; yet, there is a dearth of rigorous research about the effects of these programs.

In this study, facilitated single-visit programs are defined as one-time museum field trips in which students engage with original works of art within the physical setting of an art museum. Students are led by a representative of the museum (trained docent or museum educator) who uses inquiry-based pedagogies to guide students in discussions about works of art. The study team hypothesized that “though short in duration, single-visit programs affect students in complex, multi-dimensional ways; there is not one direct effect, but rather potentially multiple, interrelated effects that are central to the education of young people in particular: creative thinking, critical thinking, sensorial and affective responses, human connections, and academic connections.”

Through a quasi-experimental study, we measured the effects of facilitated single-visit art museum programs on students. Ultimately, we found that a facilitated single-visit program in an art museum affects students in grades 4-6 in four ways:

**QUESTIONING:** Students ask more complex questions about works of art

**MULTIPLE INTERPRETATIONS:** Students are more accepting of multiple interpretations of a work of art

**PHYSICALITY OF ART:** Students are more likely to think about art in terms of its material properties

**EMOTIVE RECALL:** Students experience greater emotive recall of the program

The above benefits are the result of a facilitated single-visit program in an art museum; please note we did not find these same benefits for students who received a similar one-time classroom program. A close examination of the data, which are elaborated upon in this document, reveals the nuances and complexity inherent in these results. The graphic on the next page begins to clarify the relationship between teaching and learning during facilitated single-visit art museum programs, although further discussion is necessary to identify its many implications.<sup>1</sup>

---

<sup>1</sup> The academic connections capacity is intentionally omitted from the graphic on the following page because we found no direct benefits in that area; however, we acknowledge there may be indirect benefits.

## CONDITIONS

### What happens during a facilitated single-visit program in an art museum?

#### Observations indicate average conditions:

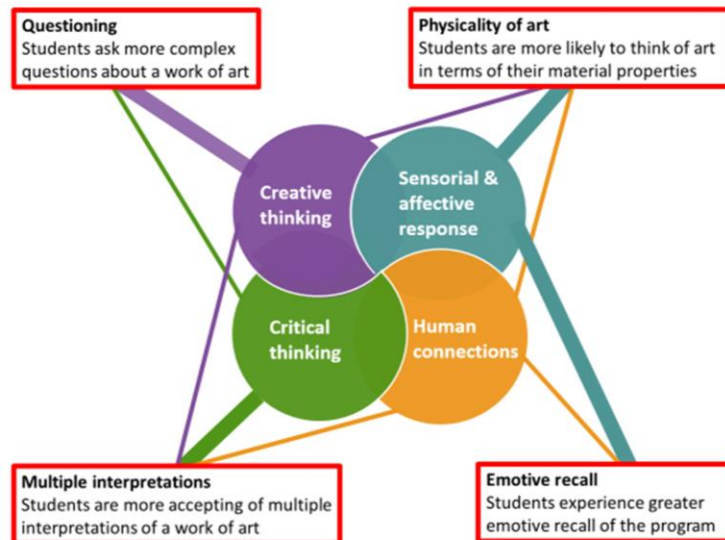
- 73-minute program
- Mostly facilitated by trained volunteer docents
- Student-to-facilitator ratio is 10:1 or less
- Includes stops at 7 original works of art
- Artwork is mostly representational (vs. abstract); largely 2D, some 3D & media

#### Observations show that pedagogy frequently supports students in:

- Interpreting
- Connecting observations to previous knowledge
- Recognizing multiple interpretations
- Questioning and investigating
- Experiencing captivation
- Connecting to human experience

## RESULTS

### What are the **results** of a facilitated single-visit art museum program on students in grades 4-6?



## STUDY MOTIVATIONS

Awareness of the need for this study emerged from simultaneous discussions within the Museum Education Division of the National Art Education Association (NAEA)<sup>2</sup> and the Association of Art Museum Directors (AAMD) during 2010 and 2011. Both groups identified a lack of rigorous research to respond to questions about the effects of facilitated single-visit art museum programs on students. While there are several studies that explore the effects of multi-visit art museum programs, there was a dearth of information about single-visit programs or “field trips.” This was considered extremely problematic as facilitated single-visit programs are the most common way in which art museums serve school students.

Therefore, in 2013, NAEA and AAMD forged a formal partnership to launch this study with NAEA serving as the lead organization. Funding from the Samuel H. Kress Foundation in 2014 supported planning, and a three-year grant from the Institute of Museum and Library Services (IMLS) supported implementation. Since then, notably, studies at the Crystal Bridges Museum of American Art started to fill this research need (Bowen, Greene, & Kisida, 2014; Greene, Kisida, & Bowen, 2014; Kisida, Bowen, & Greene, 2016). However, Crystal Bridges’ studies focus on the teaching at one specific museum. By contrast, this NAEA/AAMD study was intentionally designed to examine and understand programs that represent art museums nationwide; and as such, findings would be generalizable to the field at large. Our approach has its benefits and limitations, as does any study:

### WHAT THIS STUDY IS

This study takes a macro approach to facilitated single-visit art museum programs. From it, we can understand the effects these programs have on students in grades 4-6. Furthermore, it raises additional specific and targeted questions about facilitated single-visit programs.

### WHAT THIS STUDY IS NOT

We prioritized generalizability. Thus, this study does not explore the effects of individual aspects of facilitated single-visit programs on students in grades 4-6. For instance, this study does not prescribe best practices for pedagogy, selection of art works, or other program specifics.

---

<sup>2</sup> The Museum Education Division of NAEA will be referred to hereafter as NAEA.

## RESEARCH DESIGN

We dedicated an entire year exclusively to planning the study. NAEA, AAMD, RK&A, and a working group of art museum educators representing a range of art museum types, sizes, and communities collaborated to determine the research question and hypothesis. This collaboration included much discussion about what might be the potential effects of facilitated single-visit art museum programs on students and what aspects of the programs might influence those effects.

### RESEARCH QUESTION

What are the benefits of facilitated single-visit art museum programs – specifically, those programs guided by inquiry-based pedagogies – on students in grades 4-6?

### RESEARCH HYPOTHESIS

Though short in duration, facilitated single-visit programs affect students in complex, multi-dimensional ways; there is not one direct effect, but rather, there are potentially multiple, interrelated effects that are central to the education of young people in particular: creative thinking, critical thinking, sensorial and affective responses, human connections, and academic connections.

## STUDENT CAPACITIES

Critical to this research study is the framework developed for describing and theorizing the potential benefits to students of facilitated single-visit art museum programs. In line with recent research and based on input from art museum educators about the purpose of their work, we chose to focus this research on five capacities<sup>3</sup>: creative thinking, critical thinking, sensorial and affective responses, human connections, and academic connections. To identify and

---

<sup>3</sup> Please note that the team deliberately chose the word “capacities” to describe the five areas, instead of another word, such as “competencies” or “skills.” Our intent is to acknowledge that these five areas may be activated or given the opportunity to develop in a student, as opposed to being mastered, in the brief encounters with art during facilitated single-visit programs.

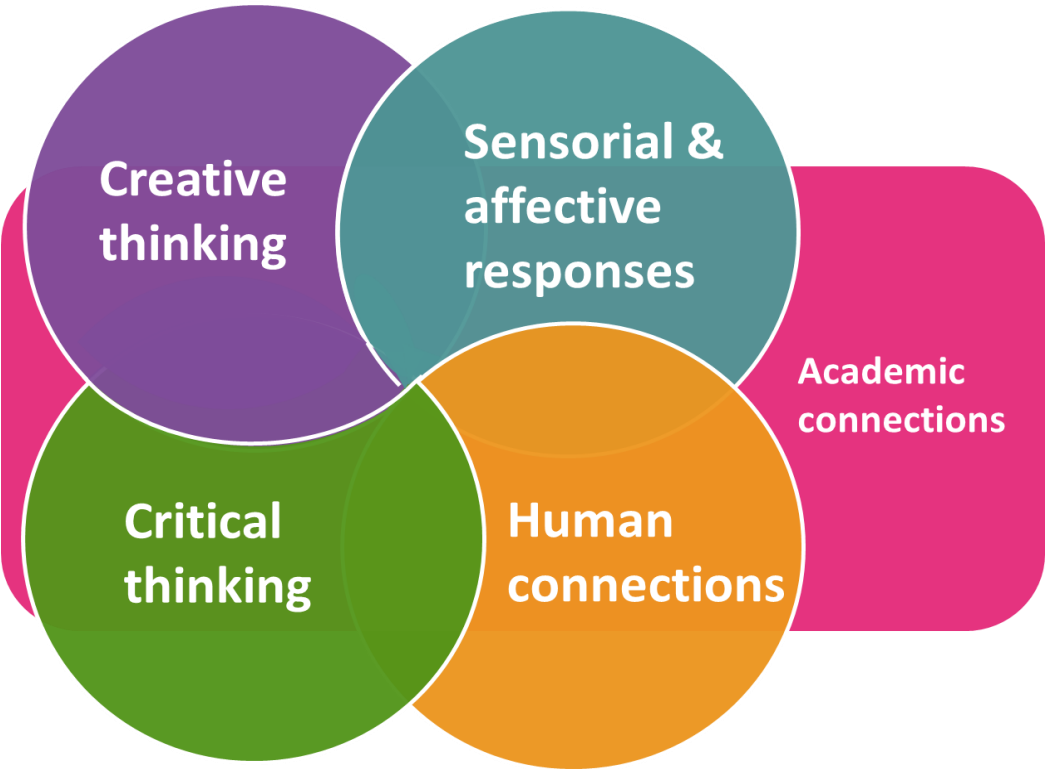


operationalize these five capacities, art museum educators drew from their experiences in the field—including the purpose of facilitated single-visit programs at their own museums as well as how others in the field describe the effects of facilitated single-visit programs. We also drew from the literature review conducted during the planning process; it includes a robust examination of all five areas, drawing from psychology, philosophy, art history, pedagogical theory, etc. to characterize and understand each capacity.

The illustration below depicts our framework for examining the impact of the facilitated single-visit museum program on students. The top layer shows four capacities—each is distinct and overlapping because cognitive psychology and neuroscience indicate that these capacities do not occur in isolation from one another—instead they are interconnected (Terrassa et al., 2016). All four are essential to cognition—or the process of acquiring and constructing knowledge—and we believe they are activated simultaneously during engagements with original works of art. Academic connections—the fifth capacity—is depicted as a layer beneath the four capacities because we conceptualize that growth in the former mentioned capacities can help students connect museum experiences to in-school learning.

For the purpose of developing research measures, we operationalized each capacity separately and describe them on the next page, pointing out ways in which they overlap.

**FRAMEWORK OF STUDENT CAPACITIES**





## CREATIVE THINKING

Creative thinking has received much attention among art museum educators as a skill nurtured in facilitated single-visit programs. This may not be a surprise since creativity has long been associated with the arts—both in art making and in thinking about art. There is loose agreement among academics and practitioners about what constitutes creative thinking. Definitions vary, dependent on the context in which creative thinking takes place (Batey, 2012). Processes linked to creative thinking are questioning and probing, divergent thinking, metaphorical thinking, flexibility, play, exploration, risk-taking, imagination, and challenging conventions, among several others (Csikszentmihalyi, 1996; Foley, 2014; Gardner, 2007; Greene, 1995, 2001). For the purposes of this study, we have operationalized creative thinking as questioning, imagining possibilities, and comfort with ambiguity; each are defined here (in no particular order):

- **Questioning** is students' proclivity to ask questions about a work of art in relationship to their interpretation of it; the questions are complex, asking "why" and/or "how"
- **Imagining possibilities** is students' ability to provide a second interpretation of a work of art that is divergent from their first interpretation
- **Comfort with ambiguity** is students' awareness that art is not immediately understandable (and requires close looking and investigation)

Noticeable here is creative thinking's close alignment with critical thinking, and the two are frequently referred to together, as they represent two capacities central to cognition (Foley, 2014). Nevertheless, critical thinking emphasizes logic and analysis, while creative thinking stresses imagination and the unknown (Forrester, 2008).

## CRITICAL THINKING

Critical thinking has become increasingly important in schools and as a result, it is a valued outcome of facilitated single-visit art museum programs. Critical thinking can be conceptualized in different ways, and we subscribe to Willingham's (2007) definition, whereby critical thinking involves "deducing and inferring conclusions from available facts" (p. 8) and calls for "demanding that claims be backed by evidence," as well as "seeing both sides of an issue [and] being open to new evidence that disconfirms your ideas" (p. 8).

This definition aligns with our two measures of critical thinking: evidential reasoning and multiple interpretations, defined here:

- **Evidential reasoning** is students' ability to provide relevant visual evidence from a work of art to explain their interpretation of what is going on in that work of art.
- **Multiple interpretations** is when students recognize there is more than one way to understand or interpret a work of art.

## SENSORIAL AND AFFECTIVE RESPONSES

Sensorial and affective responses is the most elusive of the five capacities. It refers to students' heightened perceptual, kinesthetic, or emotional responses when experiencing artworks and museum spaces. While most art museum educators would argue that facilitated single-visit programs activate students sensorially and/or emotionally, little evidence exists to demonstrate what this looks like. As outlined in the literature review (Terrassa et al., 2016), various disciplines have emphasized the value of sensorimotor responses in encounters with works of art. For example, psychologist Rudolf Arnheim (1969) contended that visual perception involves an active structuring of information and is in itself a form of thinking. Also, from a philosophical perspective, John Dewey (1980; 1934) hypothesized that engagements with art can intensify viewers' senses and stimulate their motor channels of response, making them more awake to the world and themselves.

Admittedly, we were limited in our ability to measure this capacity because of its subtle qualities, and a more comprehensive examination would be beneficial. For the purposes of this study, our measures investigated students' emotional, as opposed to sensorial, responses to the museum experience. Nevertheless, we view the two (emotion and the senses) as linked, as maintained by neuroscientist Jamie Ward (2014) who explained the way experiences that involve multiple senses, as museum experiences do, activate different neural systems, resulting in richer memories. This connection is implicit in our two measures, emotive recall and captivation, defined here:

- **Emotive recall** is students' demonstration of strong emotions in the recollection of a facilitated single-visit program, as indicated by the vividness of description, robustness of detail, and use of words or phrases that convey emotion of any kind (not just positive)
- **Captivation** is defined as students' belief that art is “amazing”

Sensorial and affective responses has strong ties to the other capacities. For instance, recent studies in cognitive science and neuroscience indicate that sensorial and affective systems are critical to cognition, such as critical and creative thinking (Damasio, 2005; Immordino-Yang, 2008; Kiefer & Barsalou, 2013; Lakoff & Johnson, 1999; Yob, 1998). Sensorial and affective responses is also inextricably linked to the human connections capacity, which is explained below.

## HUMAN CONNECTIONS

Human connections, as well as empathy, are of great interest to many educators, not just those in art museums. Museums, through their collections of artifacts and objects, are ideal settings for stimulating visitors' sense of connection to others and the self. The domain of human connections is quite broad, describing connections with other people, cultures, eras, and/or artists. Empathy is part of human connections, and it can include bodily empathy set off by a physical experience or cognitive empathy based on learning about another's situation. The RAND Corporation identified empathy as when individuals are drawn into the experiences of “people vastly different from themselves” through art (McCarthy et al., 2004, p. xvi), thereby increasing their receptivity to unfamiliar people, attitudes, and cultures.

For the purposes of this study, we defined human connections in terms of three measures:

- **Connection to lived experience** is students' ability to connect to human experiences across culture, time, and place through a work of art
- **Connection to the artist** is students' feeling of being personally connected to artworks or their makers
- **Connection to self/community** is students' deepening sense of self in their community.

Human connections is closely tied to sensorial and affective responses in terms of “bodily and emotional empathy.” According to the neuroscience research of Freedberg and Gallese (2007), viewers can experience bodily and emotional empathy in front of works of visual art, which may manifest as a sense of awe, captivation, and/or inspiration. Their studies argue that the physiological origin of this kind of empathy happens as result of mirror neurons, a special class of brain cells that allows us to replicate other people's actions in the brain.

## ACADEMIC CONNECTIONS

Art museum education departments often frame their programs as supporting students' academic studies. As described in the literature review, (and in practice), the connection between museum and school learning is framed mainly in two ways—one focused on skills and the other focused on content. The first relates to students' ability to apply classroom knowledge in a new context; practice skills that are part of local, state, and/or national standards; and transfer skills from a museum setting to academic learning. The second focuses on students' development of content knowledge in a museum setting that enhances curricular content in academic learning, assuming that the contextual information shared in the museum is indeed relevant to school curriculum (Burnham & Kai-Kee, 2011; Mayer, 2014).

We conceived the relationship between academic connections and the other four capacities as inherently about the transfer of the capacities from the museum to school, and vice versa. Therefore, as shown in the illustration on page 8, we placed academic connections beneath the other four capacities, to respect our theory that growth in the other four capacities would transfer down to in-school learning. This theory is aligned with many school districts' strategic goals to help students develop holistically for success post-graduation. However, for the purposes of this study, we measured academic connections in terms of students' perceptions of their academic life, as follows:




- **Academic connections** is students' perceived relevance of what they learn in the museum to what they learn in school.

This measure relied on students to think about and articulate connections between museum and in-school learning, which is a developmental challenge for the lower age-range of the students we studied, and thus a limitation of this study.

## METHODOLOGY

RK&A's goal was to conduct a methodologically rigorous study that could measure the effects of facilitated single-visit art museum programs on students. As shown in the diagram below, RK&A conducted a quasi-experimental study that included three study groups: one that received a museum program (Treatment A), one that received a classroom program (Treatment B), and one that did not receive any art museum program (Control). The purpose of including the Treatment B study group was to pinpoint differences between an inquiry-based art museum program in the museum with original works of art versus an inquiry-based art museum program in a school classroom with reproductions of works of art<sup>4</sup>. Six methodologies, described beginning on the next page, were used to understand the results from different perspectives. Please see the technical report for greater methodological context.

### QUASI-EXPERIMENTAL RESEARCH DESIGN

STUDY GROUP	<b>TREATMENT A</b> museum program 	<b>TREATMENT B</b> classroom program 	<b>CONTROL</b> no program 
<b>Program Intervention</b>	Single-visit <u>museum</u> program facilitated by a trained docent or museum educator in which students view <u>original works of art</u>	Single-visit <u>school classroom</u> program facilitated by a trained docent or museum educator in which students view <u>reproductions of works of art</u>	None
<b>Pre-measure</b>	Student questionnaire	Student questionnaire	Student questionnaire
<b>Program measure</b>	Observation of program	Observation of program	N/A
<b>Post-measure</b>	Student questionnaire Student interview Teacher questionnaire Teacher interview Program facilitator interview	Student questionnaire Student interview Teacher questionnaire Teacher interview Program facilitator interview	Student questionnaire Student interview Teacher questionnaire Teacher interview

<sup>4</sup> Please note that the purpose of Treatment Group B is specifically to examine the difference between a program in a museum with original works of art versus one outside a museum with reproductions. The study did not seek to draw conclusions about or test the efficacy of classroom programs.

## PROGRAM OBSERVATIONS

To provide an objective account of the program and facilitator teaching practices, RK&A observed 101 museum and classroom programs for students in grades 4-6. Data collectors were trained to conduct observations using a list of teaching practices believed to support each capacity; the list was extensive and included examples of instructions, explanations, and modeling behaviors (see excerpt below for examples of teaching behaviors and see Appendix for all behaviors). Observations were both standardized and naturalistic. That is, observers took notes during the program, writing down exactly what facilitators said and did during the program. The observer then completed a standardized observation guide within 24 hours of the program, providing ratings for the extent to which facilitators supported students in the five capacities as well as examples from their observation notes to explain their ratings. Ratings were analyzed statistically, including cross-tabulations and analysis of variance using a 0.05 level of significance.

---

## FACILITATOR TEACHING BEHAVIOR EXAMPLES

Facilitator Teaching Behaviors that Support Students in Creative Thinking	
Facilitator helps students <u>question</u> and <u>investigate</u>	<ul style="list-style-type: none"><li>• When student asks a question about what the work means, the facilitator directs him to find an answer in the work of art (e.g., Student: "What is this black thing?" Facilitator: "Are there other clues in the painting to help you figure that out?").</li><li>• Asks students questions to pose other curiosities (e.g., Facilitator: "What else do you want to know about this work of art?" or Facilitator: "What questions do you have about this work of art?")</li><li>• Models questioning and investigation: (e.g., Facilitator: "I have always wondered about this figure in the corner? What is his relationship to the group?")</li></ul>
Facilitator helps students <u>envision</u> <u>alternative</u> <u>possibilities</u> (different ways of seeing and responding)	<ul style="list-style-type: none"><li>• Asks students to place themselves in a scenario and consider different ways of seeing or responding (e.g., Facilitator: "Imagine you were the artist. What choices might you have made about the composition?" or "Why might someone want a piece of art like this in his house?")</li><li>• Challenges students to come up with an alternate possibility after s/he provides one (e.g., Facilitator: "That is an interesting thought. What else might this character be thinking?")</li><li>• Acknowledges a current condition and challenges students to think of other possibilities (e.g., Facilitator: "This is here in the museum now, but how might this artifact have been used originally?")</li></ul>

---

## STUDENT QUESTIONNAIRES

To measure change in students' perceptions as a result of the museum or classroom program, RK&A administered questionnaires to students in all three study groups pre- and post-program.

The questionnaire included mostly rating statements that pertain to the student capacities being explored, as well as a few background questions about students' relationships to art and art museums. To administer the questionnaire, a data collector distributed one questionnaire to each student. The data collector read each question aloud; students were asked to follow along at the pace of the data collector. A total of 4,134 questionnaires were collected, about one-half pre-program and one-half post-program (they were not paired for analysis). Questionnaires were analyzed statistically using linear regression with a 0.01 level of significance.

## STUDENT INTERVIEWS

To measure the effects of the program on students' abilities in the five capacities, RK&A conducted 627 interviews with students in all three study groups after the program intervention. Students were asked a standardized set of questions while looking at *The Red Rooster* by Marc Chagall, which was printed on standard 8.5 by 11-inch paper (see below).

---

### THE RED ROOSTER BY MARC CHAGALL, FROM CINCINNATI ART MUSEUM



The work of art was chosen because it is representational but not realistic. The representational qualities of the work of art were important in measuring the five capacities we sought to explore, in particular evidential reasoning as part of critical thinking. The surreal qualities were also important because the figures in the painting are not overtly representative of one race or



ethnicity. Additionally, the surreal qualities suited measuring creative thinking, particularly comfort with ambiguity.

The questions students were asked about *The Red Rooster* mimicked inquiry-based facilitation strategies, and included “What do you think is going on in this painting?” and “What makes you say that?” Students who had a program experience whether in the museum or in the classroom were also asked to recall the program at the end of the interview. All questions were open-ended, and interviewers were trained to ask all questions in the same order without adding other probing questions. Interviews were scored on 4-point rubrics pertaining to student capacities; see the example below. To generate interrater comparisons, interviews were scored by two separate coders. Rubrics received an interrater agreement of 70 percent or better.

RUBRIC FOR QUESTIONING			
1 – No achievement	2 – Emerging	3 – Developing	4 – Accomplished
The student does not ask questions or wonder about the artwork or artist.	The student asks limited questions or wonders minimally about the artwork or artist. Questions are mostly limited to who, what, where, or when questions and do not touch on why.	The student asks several questions or wonders moderately about the artwork or artists. Questions explore “why,” but do not connect to an interpretation/hypothesis.	The student asks several questions or wonders moderately about the artwork or artists. Questions explore “why,” and connect to an interpretation/hypothesis about the artwork/artist.

TEACHER QUESTIONNAIRES

To provide background information about the students and teaching in schools that may affect differences among treatment and control groups (e.g., other field trips, etc.), RK&A administered questionnaires to all teachers whose students participated in the study; 92 teachers completed the questionnaires. The questionnaire collected information about teaching practices and students’ exposure to cultural institutions. The questionnaire also asked teachers to rate what they value about art museum programs for their students.

TEACHER INTERVIEWS

To explore what teachers value about facilitated single-visit programs, RK&A conducted interviews with 13 school teachers, including those who teach general subjects and those who teach art. The interviews complement the questionnaire results in a qualitative approach, which further clarifies what teachers expect of and value about art museum programs.

PROGRAM FACILITATOR INTERVIEWS

To explore what program facilitators value about art museum programs for students and the challenges they encounter when facilitating them, RK&A conducted 19 interviews with museum educators and trained docents.



## MUSEUM SELECTION

To enhance the relevance of this study, museum partners were selected because their facilitated single-visit programs specifically matched criteria set forth by the team. The criteria are based on what were determined as **prevalent practices** in facilitated single-visit art museum programs based on the results of the 2015 state-of-the-field survey conducted by RK&A. For instance, we focused the study on programs that apply inquiry-based teaching methods, including asking open-ended questions and allowing group dialogue to evolve in response to students' comments and questions—two of the most prevalent teaching behaviors reported (see the stats below).

---

### PREVALENT TEACHING PRACTICES IN FACILITATED SINGLE-VISIT ART MUSEUM PROGRAMS

Of art museums that responded to the state-of-the-field survey about facilitated single-visit programs:

**98%** indicated that the facilitator asks open-ended questions

**95%** indicated group dialogue evolves in response to students' comments and questions

**67%** indicated program content emerges organically from the group

---

Criteria also reflected program format. For example, we studied museum programs that reported an average student-to-facilitator ratio of 20:1 or less. We also focused on museum programs that reported an average of 5 stops or less at works of art or groups of artworks during programs. These two criteria are prevalent practices per the state-of-the-field results (RK&A, 2015) and are considered necessary by the team for facilitating inquiry-based teaching.

---

### PREVALENT FORMAT FOR FACILITATED SINGLE-VISIT ART MUSEUM PROGRAMS

Of art museums that responded to the state-of-the-field survey about facilitated single-visit programs:

**86%** reported a student-to-facilitator ratio of 20:1 or less

**55%** reported making 5 stops or less at works of art or groups of works of art

---

Additional criteria were applied to promote program consistency. For example, the state-of-the-field study asked about training facilitators in more than one area, such as in art history *and* inquiry, articulating and applying student outcomes to train facilitators, and conducting evaluations. Finally, as part of our museum-partner selection process, we applied practical

---

considerations, such as ensuring the potential museum partner served an ample number of students in grades 4–6 in school districts whose regulations for conducting research with students were not prohibitive given the study timeline. Importantly, we eliminated core team members’ museums from the list of potential partners.

Once we completed the selection process for museum partners, we requested the museums lead facilitated single-visit programs as they normally would with two caveats: refrain from offering (1) pre-visit outreach experiences (i.e., a facilitator could not visit the students at school before the museum visit, although museums could send pre-visit, printed materials to teachers to use at their discretion); and (2) separate studio art-making components with programs (although drawing or modest gallery activities were permissible). We understood that imposing few program restrictions might limit our ability to correlate nuances of teaching practices to student outcomes, yet we considered the benefit to understanding the impact of the most prevalent type of facilitated single-visit museum program on students nationwide as paramount. Were the teaching practices in our sample consistently exemplary? No. Did every program go off without a logistical hitch? Of course not. But this is the reality we wanted to understand.

## SCHOOL SELECTION

The same care taken to identify museum partners extended to school selection as well. Participating schools were recruited from the dominant public-school districts served by the museum partners. Permissions from all school districts were secured via their formal research review process or through communications with the school superintendent. With the permission of school district administrators, the NAEA Project Manager recruited schools within those districts. Some of the participating schools had an existing relationship with the museum partner, but some did not. Schools were invited if:

- ◆ Free or reduced lunch percent for the school is 40% or greater (Title I status).<sup>5</sup>
- ◆ English Language Learner percent for the school is less than 25% (since the study was administered in English).

RK&A assigned schools and/or classrooms across the study groups (A, B, or C). Designations were not randomized, but determined based on a number of factors, including schools’ scheduling limitations and efforts to evenly distribute students across study groups and museum partners.<sup>6</sup> A total of 180 classrooms participated in the study, with individual museum partners serving between 19 and 42 classrooms. As such, this study represents the classrooms of suburban and urban students who live within an hour of small- to large-sized cities across the United States.

---

<sup>5</sup> The majority of art museums actively reach out to Title 1 schools (57 percent) (RK&A, 2015).

<sup>6</sup> Because schools were not randomly assigned to a study group, regression analysis was used to determine if any school-related variables affected the results of study group comparisons.

## PROGRAM OBSERVATION FINDINGS

As context to understand the impact of facilitated single-visit programs on students, RK&A observed 101 museum and classroom programs. Observations focused on the teaching practices of the facilitator (e.g., museum educator or trained volunteer docent)—not on student behaviors. Observations revealed that programs (museum and classroom) varied from museum to museum and also from facilitator to facilitator. However, all prescribed the inquiry-based model that we desired to study.

Museum programs ( $n = 66$ ) averaged 73 minutes and were largely facilitated by trained volunteer docents, which matches findings from the state-of-the-field survey (RK&A, 2015). During the museum program, students viewed an average of 7 works of art. Notably, classroom programs differed from the museum programs in a few ways: they were shorter in length (mean = 56 minutes), students viewed fewer works of art (mean = 5 artworks), and the student-facilitator ratio was usually more than 11:1 whereas the museum programs were 10:1 or less.

---

### CHARACTERISTICS OF PROGRAMS OBSERVED

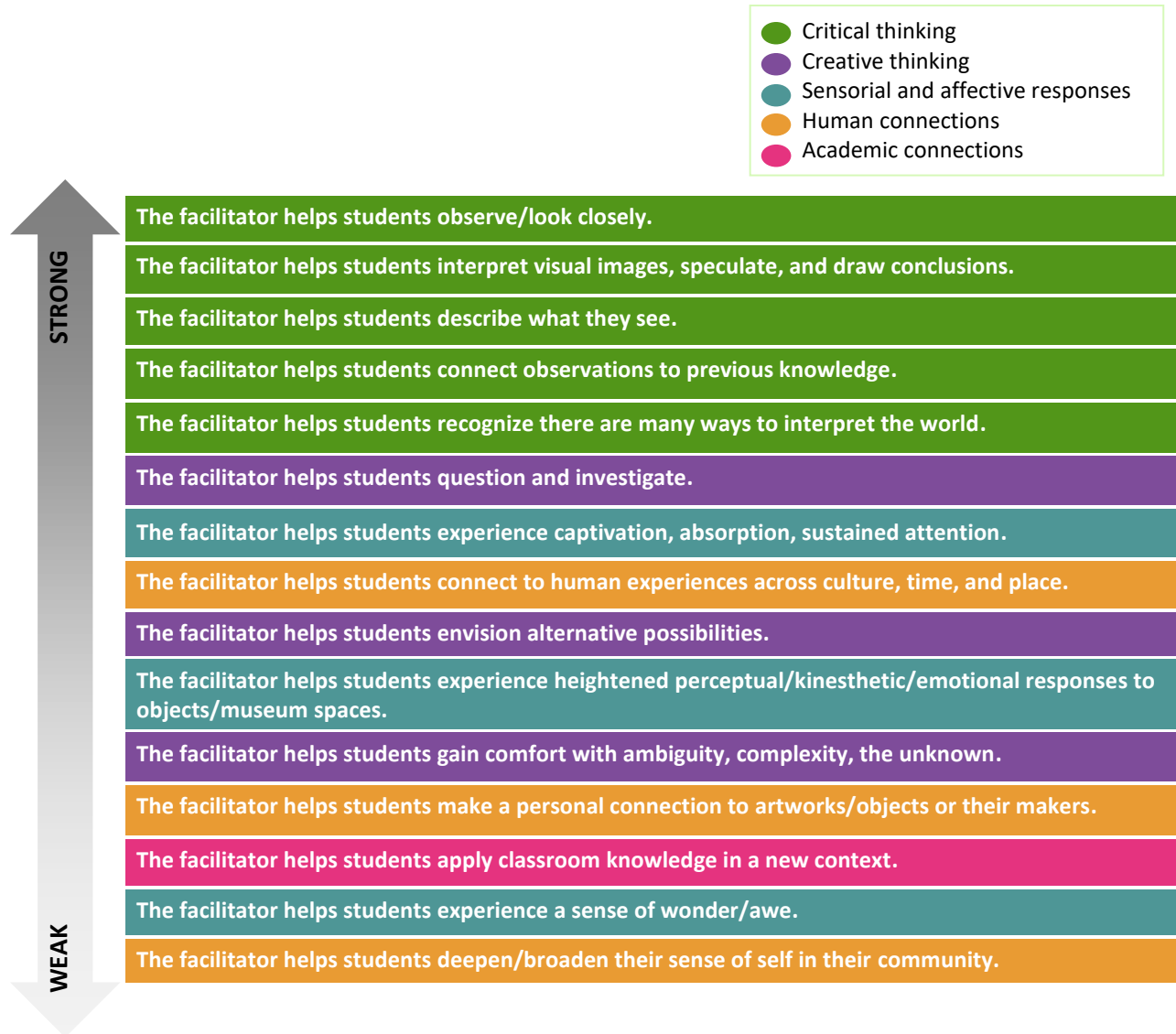
	Museum	Classroom
Mean length of program (in minutes)	73	56
Mean number of works of art viewed	7	5
Percent facilitated by docent	77%	49%
Typical student-to-facilitator ratio	10:1 or less	11:1 or more

---

Overall, we found that facilitators strongly emphasize teaching behaviors that support critical thinking. In particular, facilitators support students in observing and looking closely as well as in interpreting visual images, speculating, and drawing conclusions (the two highest-rated items as shown in the graph on the next page). Teaching in support of questioning and investigating, a measure linked to creative thinking, is also strongly emphasized.

---

**TEACHING PRACTICES EMPHASIZED: ORDERED FROM GREATEST TO LEAST EMPHASIZED**

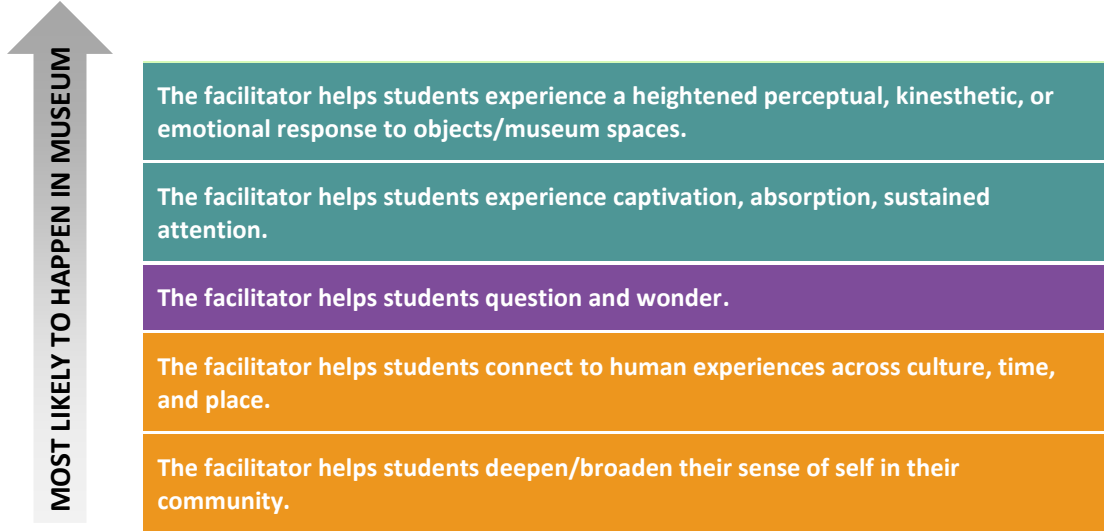


Overall teaching behaviors in the museum were similar to those observed in the classroom. However, a few differences emerged: teaching behaviors in support of creative thinking, sensorial and affective responses, and human connections were strongest in museum settings versus classroom settings. As shown below, two types of teaching behaviors related to sensorial and affective responses were much stronger in the museum than in the classroom.

**DIFFERENCES IN MUSEUM AND CLASSROOM TEACHING**

- Critical thinking
- Creative thinking
- Sensorial and affective responses
- Human connections
- Academic connections

Statistically, teaching behaviors more likely to happen in the museum (vs. classroom):



## STUDENT IMPACT FINDINGS

This section focuses on reporting the impact of a facilitated single-visit art museum program on students in grades 4-6 as understood through student interviews and questionnaires. Ultimately, we found that a facilitated single-visit program in an art museum affects students in four ways:

**QUESTIONING:** Students ask more complex questions about works of art

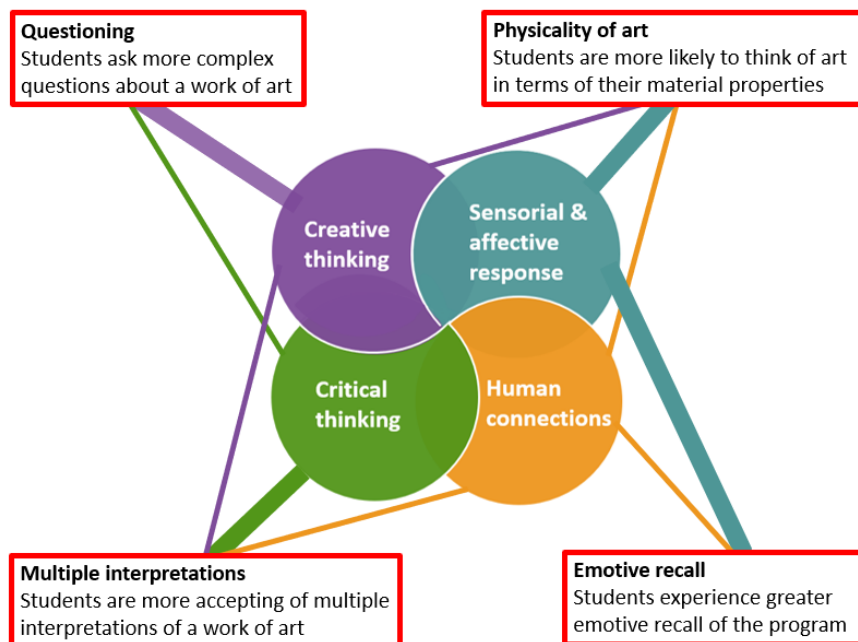
**MULTIPLE INTERPRETATIONS:** Students are more accepting of multiple interpretations of a work of art

**PHYSICALITY OF ART:** Students are more likely to think about art in terms of its material properties

**EMOTIVE RECALL:** Students experience greater emotive recall of the program

A close examination of the benefits for students who experienced a museum program reveals the complexity inherent in their relationship to the capacities, as depicted in the illustration below and described in detail on the following pages.

### IMPACT OF FACILITATED SINGLE-VISIT MUSEUM PROGRAMS ON STUDENTS



## QUESTIONING

Results show that students who participate in a facilitated single-visit program in an art museum ask more complex questions about works of art than students who do not. On a 4-point rubric that measures students' ability to ask questions about a work of art during interviews, students who had a museum program (Treatment A) scored higher than students who did not have a museum program (Control). The measure emphasizes the complexity of the queries and not just the quantity of queries. For instance, a student who scores high in questioning will ask questions that explore why something is the way it is; the questions also connect to an interpretation or hypothesis the student has about a work of art or artist. By comparison, students who score low on this measure may not ask any questions or the questions are limited to who, what, where, or when questions. See the figure on the next page.

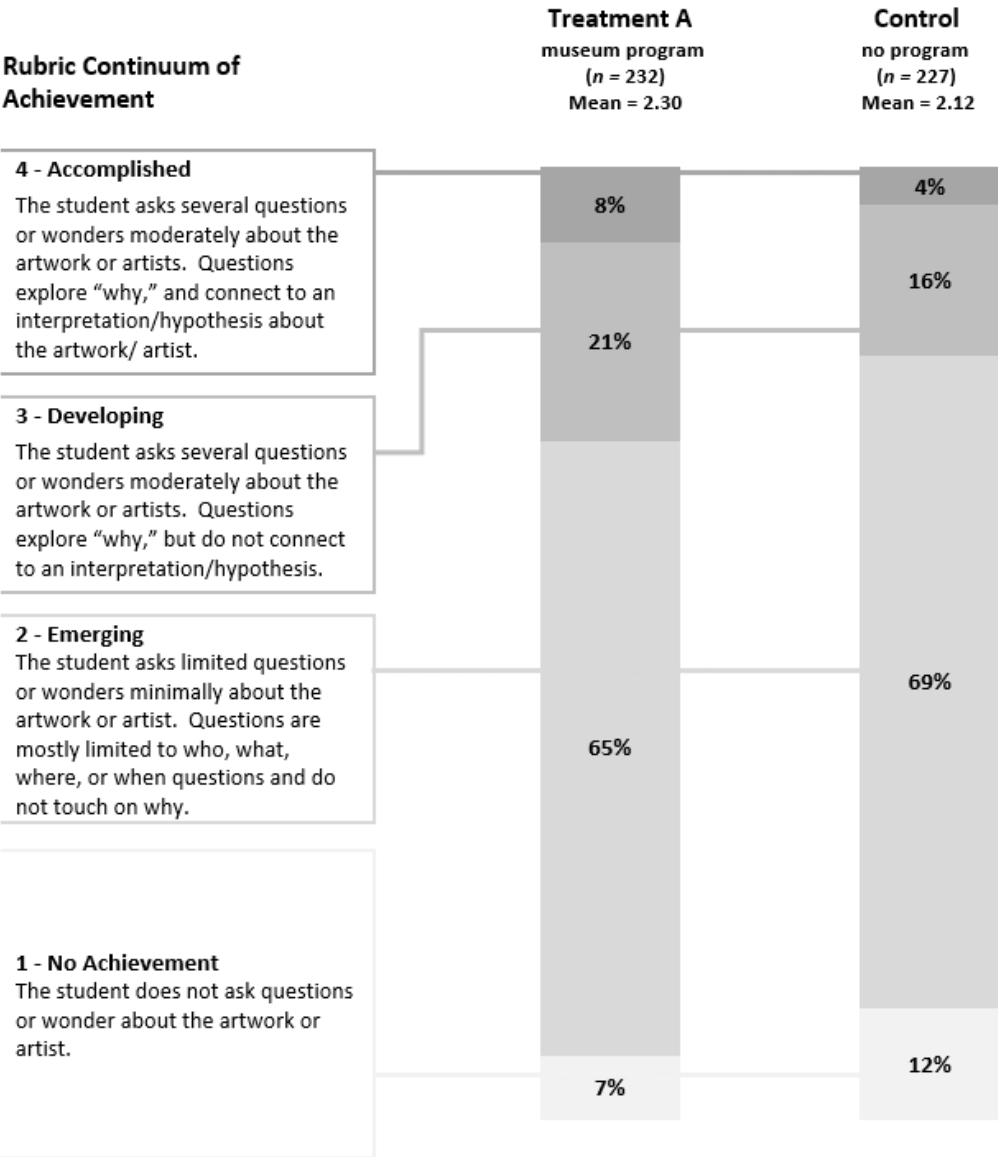
The fact that students are more likely to ask rich questions about an artwork after experiencing a museum program is notable. Questioning demonstrates an openness and curiosity—characteristics inherent in creative thinking. Questioning also applies to critical thinking, as asking questions is an important stage in formulating an interpretation. Often, questions are the source of knowledge and an indicator of true curiosity and interest. According to Socrates, true teaching and learning happens only through questions, and the significance of questioning to learning has continued to be recognized over time. See the excerpt from one student interview below, that illustrates the creative and critical thinking in students' questioning:

“I wonder what all the characters are thinking in their head and what they actually are doing. Is this guy doing a happy song or a sad song? Is this guy trying to surprise him or something? And is this guy actually flying or is he just jumping really high? And is this guy a ghost, invisible, or just outlined?”

Program observations, reported in the previous section, give us insights into the experience students had in the program and help explain how students' capacity for questioning was supported. Observations indicate that students spent a relatively long time with works of art (about 10 minutes per work) allowing time for close looking and the percolation of questions and curiosities. We also know the student-to-facilitator ratio was low (about 10:1), presumably allowing children the space to actively participate. We also know that the pedagogy employed most often by facilitators encouraged critical and creative thinking, both of which are important to questioning. For instance, facilitators frequently supported students in observing closely, formulating interpretations, connecting to previous knowledge, and asking questions.



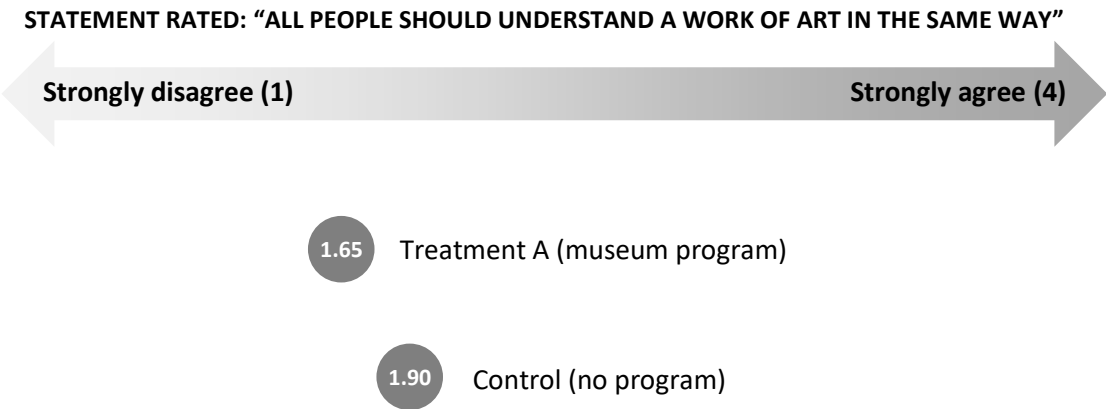
STUDENTS WHO RECEIVED A MUSEUM PROGRAM ARE MORE ABLE TO QUESTION



MULTIPLE INTERPRETATIONS

Results show that students who participate in a facilitated single-visit program in an art museum are more accepting of multiple interpretations. For this study, we defined multiple interpretations as when students recognize there is more than one way to understand or interpret a work of art. On surveys, students who experienced a museum program (Treatment A) were more likely to disagree with the statement “All people should understand a work of art in the same way” than students who did not experience a museum program (Control). This shows that students who experienced a facilitated single-visit program recognize that art can be interpreted in different ways by different people.

STUDENTS WHO RECEIVED A MUSEUM PROGRAM ARE MORE LIKELY TO DISAGREE THAT “ALL PEOPLE SHOULD UNDERSTAND A WORK OF ART IN THE SAME WAY”



Recognizing multiple interpretations is an indicator of critical thinking because doing so is part of the interpretative process, as defined by Willingham (2007). Critical thinking involves “deducing and inferring conclusions from available facts” (p. 8) and calls for “demanding that claims be backed by evidence,” *as well as “seeing both sides of an issue [and] being open to new evidence that disconfirms your ideas”* (p. 8). Multiple interpretations also overlaps with creative thinking and human connections. For example, knowing there may be more than one side of an issue could be considered a first step towards imagining possibilities, which is thought to be a sign of creative thinking. And, accepting another’s interpretation demonstrates some degree of human connections and it supports the definition of empathy as defined by the RAND Corporation, whereby empathy is when individuals are drawn into the experiences of “people vastly different from themselves” through art (McCarthy et al., 2004, p. xvi), making them more receptive to others.

The finding that students who experience a facilitated single-visit museum program are more likely to think that different people understand artworks differently is compelling, as it demonstrates an open-mindedness towards others’ ideas. A study of facilitated single-visit field trips to Crystal Bridges Museum of American Art showed similar benefits when aggregating students’ responses to four statements into one tolerance measure (Greene, Kisida, & Bowen, 2014). Those four statements are: 1) People who disagree with my point of view bother me; 2) Artists whose work is critical of America should not be allowed to have their work shown in art museums; 3) I appreciate hearing views different from my own; and 4) I think people can have different opinions about the same thing.

What might account for this result? As with questioning, it seems providing students with time and space to look at and talk about works of art in a group, combined with skilled facilitators, helped students realize that different people can have different ideas about the same work of art. Observations show again that pedagogical tactics employed most often by facilitators supported critical thinking and, specifically, helping students recognize that having multiple interpretations is positive. For instance, facilitators would tell students there are no right or wrong answers or would model openness to different interpretations when accepting students’ responses.

## PHYSICALITY OF ART

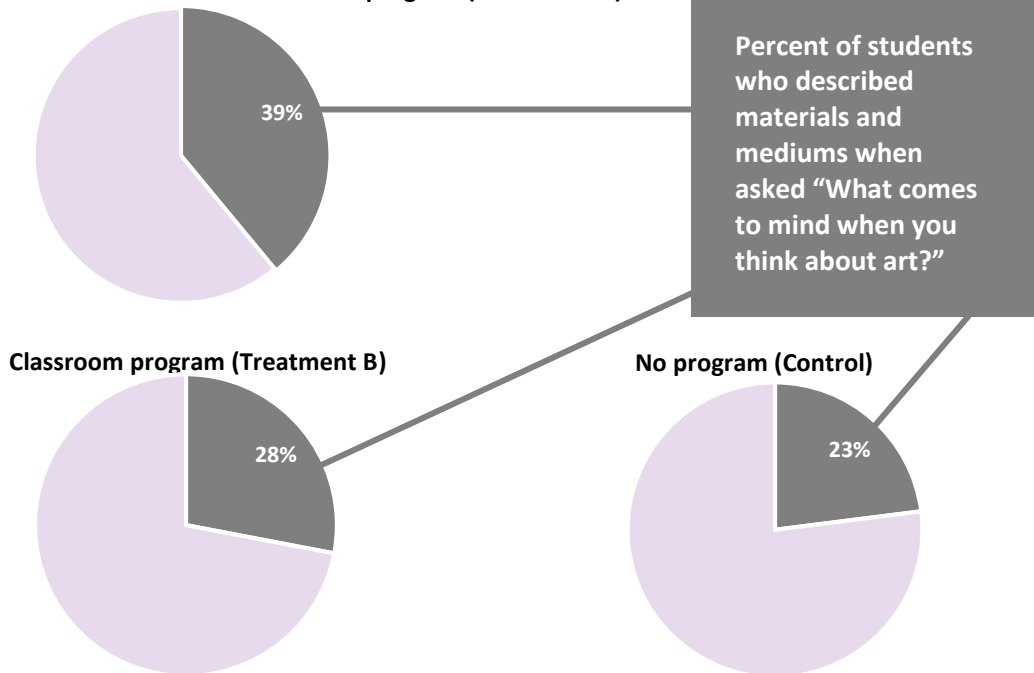
Results show that students who participate in a facilitated single-visit program in an art museum are more likely to think of art in terms of its physicality. Notably, this finding emerged organically from the interview data and was unanticipated. When the finding emerged, we defined it as students' thinking about art in terms of its physical and material properties.

We found from interviews that students who experienced a museum program (Treatment A) were more likely than students who experienced a classroom program (Treatment B) *and* students who had no program (Control) to talk about art in terms of the different materials and mediums from which works of art can be made (see the graph below).<sup>7</sup> These responses were generated from an open-ended question that asked, "What comes to mind when you think about art?" For context, other things that came to mind for students when they think about art is that it requires imagination, is pretty, and is made by artists—responses provided in similar frequency across study groups.

---

### STUDENTS WHO RECEIVED A MUSEUM PROGRAM ARE MORE INCLINED TO CONSIDER MATERIALS AND MEDIUMS WHEN PROMPTED TO THINK ABOUT ART

Students who received a museum program (Treatment A)



---

<sup>7</sup> There is no statistical relationship between Treatment B and Control.

We hypothesize that thinking about art in terms of its physical properties relates closely to sensorial and affective responses, as well as human connections and creative thinking. We did not look for specific teaching behaviors in program observations that may explain this result but speculate that experiencing the physicality of an original work of art (even through sight) may trigger a sensorial response whereby the student “feels” the art even though they may not have touched it. Hooper-Greenhill (2000) explains:

The exchange between object and viewer is more than a cognitive one. The encounter between an active agent and an object has two sides to it; the interpretive framework brought to bear by the individual subject, which is both personal and social, and the physical character of the artifact. The material properties and the physical presence of the artifact demand embodied responses, which may be intuitive and immediate. Responses to objects are culturally shaped, according to previous knowledge and experience, but the initial reaction may be tacit and sensory rather than an articulated verbal level. (p. 112)

We also relate this result to creative thinking and human connections in that thinking of art in terms of physical properties may lead to curiosity about the creator of the art and materials used. This echoes a small study of teens by Olga Hubbard (2015) showing that direct engagement with objects also seemed to trigger students’ sense of touch; in turn, this seemed to prompt speculation among students about the artists’ choices and creative process—reflections which were not at all evident among those who viewed reproductions.

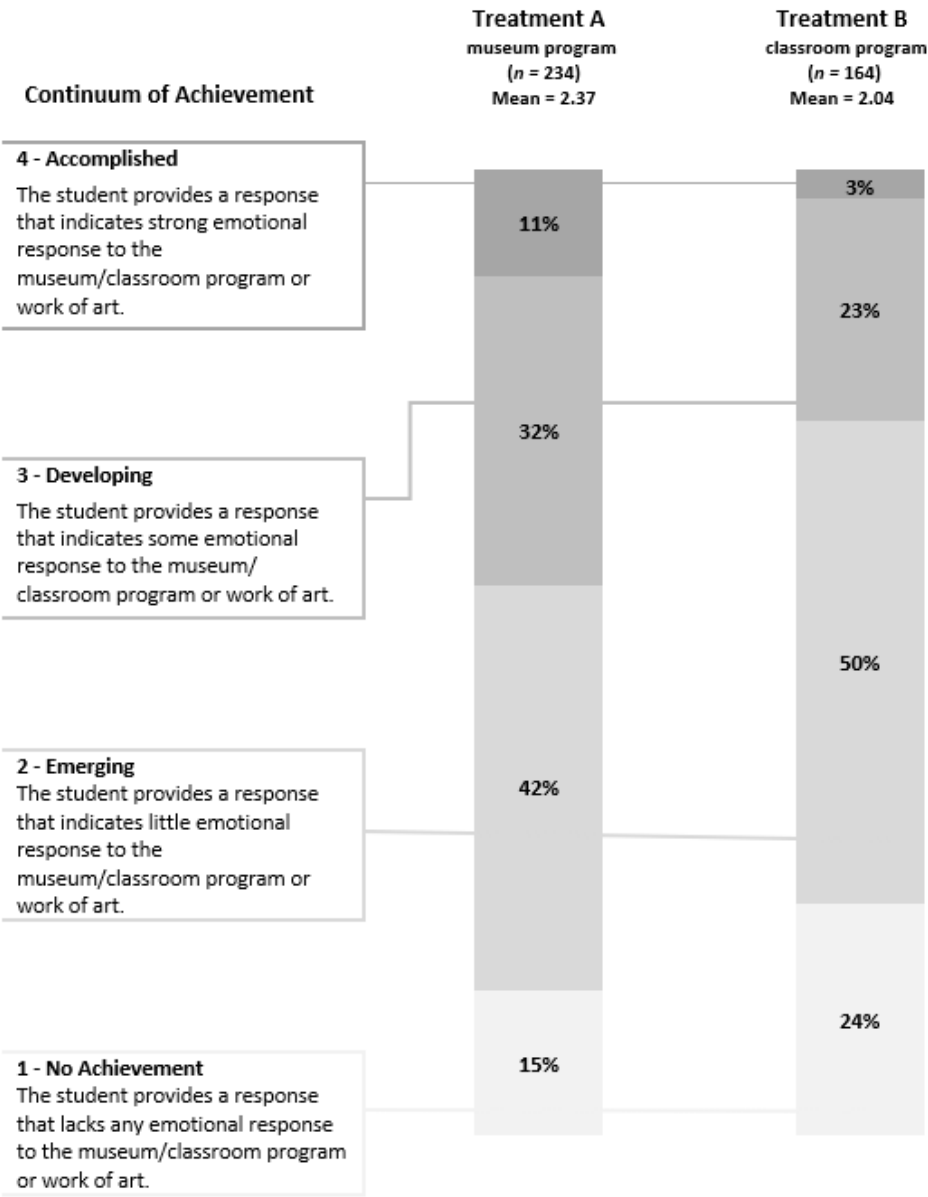
## EMOTIVE RECALL

Results show that students who experienced a facilitated single-visit program in an art museum are more likely than students who experienced a program in the classroom to recall their visit in more detail and with greater emotion. We defined emotive recall as a student's recollection of the museum/classroom visit or work of art indicating a strong emotional response as demonstrated through degree of detail and description, naming emotions, robustness of response, and rapidness/excitability expressed in the voice.

Emotive recall was measured by students' responses to two questions about their program experience (treatment groups only). The first question, "What part of the visit stands out as the most memorable?" was intentionally open-ended to allow students to name any stand-out aspects of the experience (e.g., the elevators, bus ride, etc.). A second question focused on the works of art: "I'd like you to think back and recall one work of art. Can you describe that work of art?" Scoring did not privilege general experiences over art-focused experiences. Notably, students who experienced a program in the museum (Treatment A) scored higher on this measure than students who experienced a program in the classroom (Treatment B), meaning their responses were more emotional (see the graph on the next page).

We believe emotive recall is an indicator of sensorial and affective responses. The relationship between emotion and the sensorial response aligns with the claims of professor of neuroscience Jamie Ward (2014)—that multi-sensory experiences, such as museum experiences, activate different neural systems that can result in richer memories. Also, Freedberg and Gallese (2007) describe emotional responses that viewers can have in front of an artwork as rooted in the work of mirror neurons, which allow people to replicate others' actions in the brain. Certainly, we saw that the students who had a museum program recalled their experience more emotionally and vividly than students who participated in a classroom program—the variables being the museum and original works of art.

STUDENTS WHO EXPERIENCED A MUSEUM PROGRAM ARE MORE LIKELY TO RESPOND EMOTIVELY





Emotive recall is also related to human connections and empathy. In art and aesthetic education, the relationship between art and empathy has received considerable attention. For example, from a philosophical perspective, John Dewey (1980) argued that experiences with art can heighten viewers' senses and make them more awake to the world and themselves. Like Dewey, philosopher Maxine Greene (1995, 2001) addressed the self-awareness that art experiences can nurture. Similarly, she argued that encounters with works of art can lift the veil of routine and convention, awakening people to themselves and the world around them. And yet another aspect of "connections with oneself" is found in Csikszentmihalyi and Robinson's (1990) study, which described art encounters as means for participants to question or consider themselves, their development, and/or their relationship to the world.

There is also an important connection between emotional responses and cognition. Zisch, Gage, and Spiers (2014) explain how the human brain represents and remembers space, elucidating how we construct a mental image of architecture in order to help us navigate and create memories. Brieber, Nadal, Leder, and Rosenberg (2014) find that viewing art in a museum is more stimulating, positive, engaging, and enjoyable than viewing images of art on a computer screen in the laboratory; recall is also higher, with spatial layout cues assisting retrieval. They conclude that encountering works of art in the museum enhances cognitive and affective processes and assists in encoding long-term memory (Brieber et al., 2014). Finally, Immordino-Yang and Damasio (2007) propose that developing and acknowledging students' emotional capacities may help students form the ability to apply accompanying cognitive skills and intellectual knowledge to future situations.

We agree with the RAND Corporation's assessment that there is a need for additional research into affective responses "beyond the quantifiable" (McCarthy et al., 2004). Such research could begin to further clarify different types of responses—as well as the stimuli that promote these responses. In addition, such research might also illuminate how emotion works in concert with other results of our study, such as those involving questioning.

## IMPLICATIONS

While we will continue to work with the art museum educators, leaders, and policy makers to unravel the full significance of the results, we believe these findings have numerous implications.

1

**Art museums should advocate for facilitated single-visit programs using the specific benefits measured in this study.**

Again, we found that a facilitated single-visit program in an art museum affects students in grades 4-6 in four ways:

### **QUESTIONING**

Students ask more complex questions about works of art

### **MULTIPLE INTERPRETATIONS**

Students are more accepting of multiple interpretations of a work of art

### **PHYSICALITY OF ART**

Students are more likely to think about art in terms of its material properties

### **EMOTIVE RECALL**

Students experience greater emotive recall of the program

2

**Art museums should be cautious about making broad claims beyond the specific benefits defined above when advocating for facilitated single-visit programs.**

While the benefits above support larger capacities, such as creative and critical thinking, we caution art museums against making broad claims that facilitated single-visit programs can improve creative and critical thinking.

3

**Study results support the need for additional qualitative research into understanding sensorial and affective responses.**

This study shows that students who experienced a museum program had a greater capacity in the sensorial experience than students who received a school program. More research is needed to clarify the differences and their implications.

## REFERENCES

- Adams, M., Foutz, S., Luke, J., & Stein, J. (2007). *Thinking about art: Isabella Stewart Gardner museum school partnership program year 3 research results*. Annapolis, MD: Institute for Learning Innovation.
- Arnheim, R. (1969). *Visual thinking*. Berkeley, CA: University of California Press.
- Batey, Mark. (2012). The measurement of creativity: From definitional consensus to the introduction of a new heuristic framework. *Creativity Research Journal*, 24(1), 55–65.
- Bowen, D.H., Greene, J.P., & Kisida, B. (2014). Learning to think critically: A visual experiment. *Educational Researcher*, 43(1), 37-44.
- Brieber, D., Nadal, M., Leder, H., & Rosenberg, R. (2014). Art in time and space: Context modulates the relation between art experience and viewing time. *PLoS ONE*, 9(6), e99019. doi: 10.1371/journal.pone.0099019
- Burnham, R., & Kai-Kee, E. (2011). *Teaching in the art museum: Interpretation as experience*. Los Angeles, CA: J. Paul Getty Trust.
- Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York, NY: Harper Perennial.
- Csikszentmihalyi, M., & Robinson, R. E. (1990). *The art of seeing: An interpretation of the aesthetic encounter*. Malibu, CA: The J. Paul Getty Trust.
- Curva and Associates (2005). *Artful citizen project: Three-year project report*. Miami Beach, FL.: The Wolfsonian.
- Damasio, A. (2005). *Descartes' error*. New York, NY: Penguin Putnam.
- Dewey, J. (1980/1934). *Art as experience*. New York, NY: Perigee Books.
- Falk, J.H., & Dierking, L. (1992). *The museum experience*. Walnut Creek, CA: Left Coast Press.
- Foley, C. M. (2014). Why creativity? Articulating and championing a museum's social mission. *Journal of Museum Education*, 39(2), 139-151.
- Forrester, J. (2008). Thinking creatively; thinking critically. *Asian Social Science*, 4(5), 100-105.
- Freedberg, D. & Gallese, V. (2007). Motion, emotion and empathy in aesthetic experience. *Trends in Cognitive Science*, 11(5), 197-203.
- Gardner, H. (2007). *Five Minds for the Future*. Boston, MA: Harvard Business School Press.

- Greene, J.P., Kisida, B., & Bowen, D.H. (2014). The educational value of field trips. *Education Next*, 14(1), 78-86.
- Greene, M. (1995). *Releasing the imagination: Essays on education, the arts, and social change*. San Francisco: Jossey Bass.
- Greene, M. (2001). *Variations on a blue guitar*. New York, NY: Teachers College Press.
- Hein, G. (1998). *Learning in the Museum*. New York, NY: Routledge.
- Hooper-Greenhill, E. (2000). *Museums and the interpretation of visual culture*. New York, NY: Routledge.
- Housen, A.C. (2002). Aesthetic thought, critical thinking and transfer. *Art and Learning Research*, 18(1), 99-132.
- Hubard, O. (2015). *Art museum education: Facilitating gallery experiences*. New York, NY: Palgrave MacMillan.
- Immordino-Yang, M. H. (2008). The smoke around mirror neurons: Goals as sociocultural and emotional organizers of perception and action in learning. *Mind, Brain, and Education*, 2(2), 67-73.
- Immordino-Yang, M. H. & Damasio, A. (2007). We feel, therefore we learn: The relevance of affective and social neuroscience to education. *Mind, Brain and Education*, 1(1), 3-10.
- Kiefer, M., & Barsalou, L.W. (2013). Grounding the human conceptual system in perception, action, and internal states. In W. Prinz, M. Beisert, & A. Herwig (Eds.), *Action science: Foundations of an emerging discipline* (pp. 381-407). Cambridge, MA: MIT Press.
- Kisida, B., Bowen, D.H., & Greene, J.P. (2016). Measuring critical thinking: Results from an art museum field trip experiment. *Journal of Research and Educational Effectiveness*, 9(S1), 171-187.
- Lakoff, G. & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to Western thought*. New York, NY: Basic Books.
- Mayer, M. M. (2007). Scintillating conversations. In P. Villeneuve (Ed.) *Periphery to center: Art museum education in the 21<sup>st</sup> century* (pp. 188-193). Reston, VA: National Art Education Association.
- Mayer, M. M. (2014). I cannot tell a lie. In J.B. Acuff & L. Evans (Eds.) *Multiculturalism in art museums today* (pp. 299-316). London, England: Rowman & Littlefield.
- McCarthy, K. F., Ondaatje, E.H., Zakaras, L. & Brooks, A. (2004). *Gifts of the muse: Reframing the debate about the benefits of the arts*. Santa Monica, CA: RAND Research in the Arts.

- RK&A (2010). *The art of problem solving*. Unpublished report. New York, NY: The Solomon R. Guggenheim Museum.
- RK&A (2014). *Program evaluation: Pages program*. Unpublished report. Columbus, OH: Wexner Center for the Arts.
- RK&A (2015). *Summary of results: Survey of single-visit K-12 art museum programs*. Unpublished report. Reston, VA: National Art Education Association.
- Terrassa, J., Hubard, O., Holtrop, E., & Higgins-Linder, M. (2016). *Impact of art museum programs on students: Literature review*. Alexandria, VA: National Art Education Association.
- Tishman, S. (2003). *Investigating the educational impact and potential of the Museum of Modern Art's visual thinking curriculum*. Cambridge, MA: Harvard University.
- Ward, J. (2014). Multisensory memories: How richer experiences facilitate remembering. In N. Levent & A. Pascual-Leone (Eds.), *The multisensory museum: Cross-disciplinary perspectives on touch, sound, smell, memory, and space* (pp. 273-284). Lanham, MD: Rowman & Littlefield.
- Willingham, D.T. (2007). Critical thinking: Why is it so hard to teach? *American Educator*, 31, 8-19.
- Yob, I.M. (1998). Cognitive emotions and emotional cognitions in the arts. *Journal of Aesthetic Education*, 32(2), 28-40.
- Zisch, F., Gage, S. & Spiers, H. (2014). Navigating the museum. In N. Levent & A. Pascual-Leone (Eds.), *The multisensory museum: Cross-disciplinary perspectives on touch, sound, smell, memory, and space* (pp. 215-237). Lanham, MD: Rowman & Littlefield.

## NOTE TO READERS

This study generated an immense amount of data. RK&A has prepared three separate report documents to help different readers find the study information they seek and make sense of the results.

### SUMMARY & DISCUSSION

The Summary and Discussion, this document, highlights and interprets key findings from the study and discusses their implications for the field. We recommend reading this document for a top-level understanding of the study. Methodological details are abbreviated.

### TECHNICAL REPORT

The Technical Report contains, from our perspective, all the necessary context for readers to interpret the findings. We describe the study's intentions and research design and report findings by methodology to help readers understand the results at a granular level (as opposed to the top-level approach of the summary report). Please note that, while we aim for this technical report to be comprehensive, we have relegated certain methodological or analytical details to the report appendix.

### REPORT APPENDIX

This document includes study instruments (e.g., questionnaires, interview guides, etc.) and other supplemental information for those interested in interpreting or asking their own questions of the data.

For interested readers: two other publications instrumental to planning this study are: 1) Literature review prepared by several NAEA contributors; and 2) State-of-the-field survey of art museums conducted by RK&A.

### HAVE QUESTIONS ABOUT THE STUDY?

For questions about the research design and study results, please contact:

**Stephanie Downey**, Director, RK&A – [downey@rka-learnwithus.com](mailto:downey@rka-learnwithus.com)

**Amanda Krantz**, Managing Director, RK&A – [krantz@rka-learnwithus.com](mailto:krantz@rka-learnwithus.com)

For questions about dissemination of the results or other queries, please contact:

**Emily Holtrop**, NAEA/AAMD Impact Study Project Director & Director of Learning & Interpretation, Cincinnati Art Museum – [emily.holtrop@cincyart.org](mailto:emily.holtrop@cincyart.org)

**Meghan Pennisi**, NAEA/AAMD Impact Study Project Manager – [mpennisi@arteducators.org](mailto:mpennisi@arteducators.org)