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**SITE RESULTS FOR COLUMBUS MUSEUM OF ART,
PARTNER MUSEUM FOR THE:**

IMPACT STUDY

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



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

INTRODUCTION

In 2015, the National Art Education Association (NAEA) was awarded a National Leadership grant by the Institute of Museum and Library Services (IMLS) for its Museum Education Division to work in partnership with the Association of Art Museum Directors (AAMD) to study the impact of facilitated single-visit art museum programs (tour-based programs) on students in grades 4-6. RK&A designed and implemented this study with six museum partners across the country. The study focused on measuring the effects of facilitated single-visit art museum programs on five student capacities: creative thinking, critical thinking, sensorial and affective responses, human connections, and academic connections.

This document presents data for the Columbus Museum of Art (CMA) alongside aggregate results from the other five participating museum sites for reference. It focuses on the results of museum program observations and questionnaire and interview data from students in the Treatment A study group (those who received a museum program), as these results are the most salient for the museum. A complete presentation of results can be found in the study's three main reports—the Summary and Discussion, Technical Report, and Report Appendix.

HAVE QUESTIONS ABOUT THE STUDY?

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

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FINDINGS: PROGRAM OBSERVATIONS

RK&A collected 66 observations of the museum programs provided to Treatment A study groups; 14 were at CMA. Observations were both standardized and naturalistic. That is, observers took naturalistic notes during the program, writing down what facilitators said and did during the program and how students and teachers responded. The observer then completed a standardized observation guide, providing ratings for the extent to which facilitators supported students in the capacities and examples, as indicated in their notes, to explain their ratings.

The emphasis of the observation was on how the facilitator (a staff educator, docent, or student docent) led the program. In particular, observers looked for teaching behaviors used to support students in the five capacity areas: creative thinking, critical thinking, sensorial and affective responses, human connections, and academic connections.

Analysis is quantitative, using the observer ratings from the standardized observation guide among other variables. RK&A did not run inferential statistics to examine relationships among variables by museum (e.g., comparing one museum to another) because the sample size is too small to yield reliable results.

Note to the museum: please exercise caution in using this data to generalize how your programs compare to other museums given the small sample of program observations at CMA.

CONTEXT OF MUSEUM PROGRAMS

Programs observed at the CMA averaged 60 minutes. For all of the programs observed at the CMA, students viewed six or more works of art, and the ratio of students to facilitators was 10:1 or less. Programs at the CMA were rarely facilitated by staff.

DIFFERENCES IN CMA AND OTHER MUSEUMS

	Mean time in minutes	
	CMA (n = 14)	Other Museums (n = 52)
Program Length		
Length in minutes	60	74

	% of observations	
	CMA (n = 12)	Other Museums (n = 51)
Number of works of art viewed		
≤ 5 works of art	0	51
6 or more works of art	100	49

	% of observations	
	CMA (n = 14)	Other Museums (n = 52)
Facilitator type		
Staff	7	27
Other	93	73

	% of observations	
	CMA (n = 14)	Other Museums (n = 52)
Student: Facilitator Ratio		
10:1 or less	100	35
11:1 or more	0	65

BEST-PRACTICE TEACHING BEHAVIORS

Observers rated six best-practice teaching behaviors that program facilitators exhibited on a scale from 1 to 7, where 1 is “Not at all” and 7 is “Very much” to assess the frequency of teaching behaviors that are generally associated with best practices in art museum teaching. Overall, facilitators at the CMA frequently validated students (mean = 6.8) and asked open-ended questions (mean = 6.7) during museum programs. They less frequently checked for understanding or allowed program content to emerge organically or evolve from group dialogue during museum programs (mean = 5.4).

BEST PRACTICE TEACHING BEHAVIORS	Mean rating on scale:	
	1 = Not at all / 7 = Very much	
Teaching behaviors	CMA (n = 14)	Other Museums (n = 52)
The educator validates students. <i>Examples: Affirms students' responses; repeats students' responses aloud; encourages differing responses to works of art</i>	6.8	5.7
The educator asks open-ended questions. <i>Examples: Asks a variety of open-ended questions throughout program; probes deeper into student responses</i>	6.7	6.0
The educator is open and attentive. <i>Examples: Maintains eye contact and uses open body language; encourages and affirms students' responses; reads students' engagement and adjusts program activities accordingly</i>	6.4	5.1
The educator is enthusiastic. <i>Examples: Verbally expresses enthusiasm and excitement about art and students' responses; physically expresses enthusiasm (e.g., smiles, gestures)</i>	6.4	5.1
The educator checks for understanding/knowledge. <i>Examples: Checks for previous knowledge of terms and concepts; waits for students to respond; paraphrases and expands on responses</i>	5.4	4.9
The educator allows program content to emerge organically/evolve from group dialogue. <i>Examples: Allows students' interests to direct selection of the works of art discussed; allows students' questions to direct discussions around works of art</i>	5.4	4.4

TEACHING PRACTICES IN SUPPORT OF STUDENT CAPACITIES

While the study team believes there to be overlap among the capacities, for the purpose of the study, we have tried to isolate them and the teacher behaviors that support the capacities. The following pages present the total mean ratings for facilitators' teaching behaviors in support of the capacities on a scale from 1, "Weak," to 7, "Strong."

OBSERVATION AND DESCRIPTION TEACHING BEHAVIORS

Observers noted two teaching behaviors that support observation and description. Facilitators at the CMA received strong ratings for "facilitator helps students to observe/look closely" (mean = 6.4) and "facilitator helps students describe what they see" (mean = 6.1).

OBSERVATION AND DESCRIPTION	Mean rating on scale: 1 = Weak / 7 = Strong	
	CMA (n = 14)	Other Museums (n = 52)
Teaching behaviors		
Facilitator helps students to observe/look closely. <i>Examples: Provides 20+ seconds for observing; suggests strategies for close-looking</i>	6.4	5.8
Facilitator helps students describe what they see. <i>Examples: Probes students to describe specific details; suggests types of details to observe; demonstrates description for students</i>	6.1	5.4

CREATIVE THINKING TEACHING BEHAVIORS

Observers noted three teaching behaviors that support creative thinking. Facilitators at the CMA received moderate ratings on creative thinking teaching behaviors. The strongest teaching behavior was “facilitator helps students to question and wonder” (mean = 4.9).

CREATIVE THINKING	Mean rating on scale: 1 = Weak / 7 = Strong	
	CMA (n = 14)	Other Museums (n = 52)
Teaching behaviors		
Facilitator helps students to question and wonder. <i>Examples: Encourages asking questions and wondering about the work of art; models questioning and investigating</i>	4.9	4.6
Facilitator helps students envision alternative possibilities (different ways of seeing/responding). <i>Examples: Uses strategies, activities, or questions to help students envision alternative scenarios, such as imagining what might happen before or after the story in a work of art</i>	4.6	4.1
Facilitator helps students gain comfort with ambiguity, complexity, the unknown. <i>Examples: Models comfort with ambiguity; acknowledges that works of art can be strange or confusing.</i>	3.9	3.9

CRITICAL THINKING TEACHING BEHAVIORS

Observers noted three teaching behaviors that support critical thinking. The strongest behavior observed was “facilitator helps students interpret visual images, speculate, and draw conclusions” (mean = 6.1). The weakest teaching behavior to support critical thinking was: “facilitator helps students connect observations to previous knowledge” (mean = 4.3).

CRITICAL THINKING Teaching behaviors	Mean rating on scale: 1 = Weak / 7 = Strong	
	CMA (n = 14)	Other Museums (n = 52)
Facilitator helps students interpret visual images, speculate, and draw conclusions. <i>Examples: Asks questions that encourage interpretation of works of art; demonstrates interpretation for students</i>	6.1	5.7
Facilitator helps students recognize there are many ways to interpret the world. <i>Examples: Reminds students that there is not one way to interpret art; asks questions to elicit and suggest multiple perspectives</i>	5.1	4.7
Facilitator helps students connect observations to previous knowledge. <i>Examples: Asks questions to encourage connections to prior knowledge/observations; helps students compare works of art they had already seen</i>	4.3	4.9

SENSORIAL & AFFECTIVE RESPONSES TEACHING BEHAVIORS

Observers noted three teaching behaviors that support sensorial and affective responses. The strongest behavior observed at the CMA was “facilitator helps students experience a heightened perceptual, kinesthetic, or emotional response to objects/museum spaces” (mean = 5.7), and the weakest behavior observed was “facilitator helps students experience a sense of wonder/awe (“redirection from the self toward everything else”)” (mean = 4.3).

SENSORIAL & AFFECTIVE RESPONSES	Mean rating on scale: 1 = Weak / 7 = Strong	
	CMA (n = 14)	Other Museums (n = 52)
Teaching behaviors		
Facilitator helps students experience a heightened perceptual, kinesthetic, or emotional response to objects/museum spaces. <i>Examples: Uses physical activities, such as posing and acting, or prompting emotional and sensory responses</i>	5.7	4.4
Facilitator helps students experience captivation, absorption, sustained attention. <i>Examples: Allows time for close looking; provides activities to prolong engagement with a work of art</i>	4.9	4.7
Facilitator helps students experience a sense of wonder/awe (“redirection from the self toward everything else”). <i>Examples: Selects awe-inspiring works of art (e.g., very large works of art, works of art created from many different objects); tells stories about works of art</i>	4.3	3.2

HUMAN CONNECTIONS

Observers noted three teaching behaviors that support human connections. The strongest behavior observed at the CMA was “facilitator helps students connect with human experiences across culture, time, and place” (mean = 5.4), and the weakest behavior observed was “facilitator helps students deepen/broaden their sense of self in their community” (mean = 3.8).

HUMAN CONNECTIONS	Mean rating on scale: 1 = Weak / 7 = Strong	
	CMA (n = 14)	Other Museums (n = 52)
Teaching behaviors		
Facilitator helps students connect to human experiences across culture, time, and place. <i>Examples: Makes comparisons between contemporary and past experiences; invites students to imagine themselves as part of another culture, time or place</i>	5.4	4.4
Facilitator helps students to make a personal connection to artworks/objects or their makers. <i>Examples: Asks questions intended to relate to students' personal experiences and interests to the work of art</i>	4.9	3.2
Facilitator helps students deepen/broaden their sense of self in their community (e.g., school, city). <i>Examples: Uses activities, asks questions, or provides information intended to connect works of art to the community</i>	3.8	2.5

ACADEMIC CONNECTIONS

Observers noted one teaching behavior that supports academic connections, “facilitator helps students to apply classroom knowledge (vocabulary, concepts, etc.) in a new context.” On average, this behavior was moderately strong at the CMA (mean = 4.1).

ACADEMIC CONNECTIONS	Mean rating on scale: 1 = Weak / 7 = Strong	
	CMA (n = 14)	Other Museums (n = 52)
Teaching behaviors		
Facilitator helps students to apply classroom knowledge (vocabulary, concepts, etc.) in a new context. <i>Examples: Asks students what they have already learned about a specific topic or person; makes explicit connections to what students are learning in school</i>	4.1	3.5

FINDINGS: STUDENT QUESTIONNAIRES

RK&A administered questionnaires to explore students' perceptions of and attitudes toward works of art. This document presents results from the post-intervention questionnaire for Treatment A groups (i.e., after Treatment A groups had completed their museum visit). Post-intervention questionnaires were administered to all students after they experienced the program. Questionnaires were administered to an entire classroom of students all at once, with students completing the questionnaire as the data collector read each question aloud. A total of 105 post-questionnaires were completed by students in Treatment A study groups for the CMA.

RK&A used two types of statistical analyses to examine relationships between the results at the CMA and other participating museums:

- ◆ **Cross-tabulations** show the joint frequency distribution of the variables, and the chi-square statistic (χ^2) tests the significance of the relationship.
- ◆ **Analysis of variance (ANOVA)** was performed and the F-statistic was used to test the significance of the difference in means.

Statistically Significant Relationship or Difference

A 0.01 level of significance (p) was employed to preclude findings of little practical significance.¹ Statistical relationships indicate the differences in the results among two or more groups are not by chance. For example, in the case of this data set, statistical relationships indicate areas that museum programs at the CMA and other participating museums differ but not by chance.

We caution the museum in generalizing about how their programs compare to other museums from this data, since this document does not include a regression analysis to explore whether other variables (beyond the museum site variable) may have affected the results.

¹ When the level of significance is set to $p = 0.01$, any finding that exists at a probability (p -value) ≤ 0.01 is “significant.” When a finding (such as a relationship between two variables) has a p -value of 0.01, there is a 99 percent probability that the finding exists; that is, in 99 out of 100 cases, the finding is correct. Conversely, there is a 1 percent probability that the finding would not exist; in other words, in 1 out of 100 cases, the finding appears by chance.

POST-INTERVENTION QUESTIONNAIRE FINDINGS

Below are the mean results for each statement from students who attended a museum program at the CMA versus those who attended a museum program at another participating museum. Statements are shown in the order they appeared on the questionnaire.

Statistical Relationships

ANOVAs reveal that the mean ratings differ by museum on one statement. Students who attended a program at the CMA were more likely than students who attended a program at another museum to agree with the statement:

- ◆ “Talking about works of art can help me understand things I learn in school”

MEAN RATINGS FOR POST-QUESTIONNAIRE STATEMENTS ON 4-POINT SCALE Scale 1 = Strongly disagree / 4 = Strongly agree

Statements	CMA (n = 105)	Other Museums (n = 614)
A. I feel amazed when I look at works of art	3.28	3.18
B. Works of art should not be confusing	2.60	2.47
C. Things I have learned in school can help me understand works of art	3.06	2.93
D. Works of art have clues to help me understand what they mean	3.17	3.05
E. Works of art can help me understand what life was like in another time or place	3.14	3.26
F. Works of art are not related to my school work	2.34	2.33
G. I can learn about my classmates by listening to them talk about a work of art	2.51	2.46
H. All people should understand a work of art in the same way	1.69	1.64
I. Works of art help me imagine what life is like for someone else	3.00	3.10
J. When I look at works of art I use what I already know to understand it	3.13	3.06
K. I feel strong emotions when I look at works of art	2.38	2.50
L. When I look at works of art I feel bored	1.89	1.89
M. Looking at works of art can give me new ideas	3.30	3.28
N. Works of art that are complicated make me curious	3.05	3.09
O. Works of art can help me see something familiar in a new way	2.90	2.94
P. To understand what a work of art is about it is better to have someone tell me	2.59	2.42
Q. Looking at works of art can help me be a better student	2.43	2.36
R. Works of art can help me understand myself better	2.44	2.39
S. I can lose track of time when looking at works of art	2.59	2.55
T. Talking about works of art can help me understand things I learn in school	3.00	2.60

FINDINGS: STUDENT INTERVIEWS

RK&A conducted standardized, open-ended interviews to assess the effect of museum programs on students in the five aforementioned capacity areas. This document presents results from the post-intervention interviews with students in Treatment A groups (i.e., after Treatment A groups had completed their museum visit). Students were asked a set of questions while looking at a printed reproduction of *The Red Rooster* by Marc Chagall on standard 8.5 by 11-inch paper. Students were also asked to recall their museum program experience 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 additional probing questions. RK&A conducted 235 one-on-one post-interviews with students in Treatment A groups; 46 were with students who visited the CMA. Responses were rubric-scored and analyzed quantitatively.

THE RED ROOSTER BY MARC CHAGALL, FROM CINCINNATI ART MUSEUM



Interviews were scored on an analytical tool that includes four-level rubrics, where the lowest level is “1 - Below Beginning” and the highest level is “4 – Accomplished.” Rubrics include:

- ◆ Imagines or envisions possibilities (creative thinking)
- ◆ Questions and wonders (creative thinking)
- ◆ Uses evidential reasoning (critical thinking)
- ◆ Recalls experience with emotion (sensorial and affective responses)
- ◆ Connects with lived experience (human connections)
- ◆ Interprets artist’s feelings or thoughts (human connections)
- ◆ Connects program experience to learning in schools (academic connections)

Researchers scored the interviews by reading the transcripts and listening to the audio recording. One researcher scored all interviews, and a second researcher scored one-quarter of the interviews for inter-rater comparison.

RK&A used two statistical analyses to examine relationships between scores and museums:

- ◆ **Cross-tabulations** show the joint frequency distribution of variables, and the chi-square statistic (X^2) tests the significance of the relationship.
- ◆ **Analysis of variance (ANOVA)** was performed and the F-statistic was used to test the significance of the difference in means.

Statistically Significant Relationship or Difference

Using a 0.01 level of significance (p) to preclude findings of little practical significance, no statistically significant relationships emerged from inferential statistics.²

Again, please exercise caution in using this data to generalize how your programs compare to other museums given the small data sets.

² When the level of significance is set to $p = 0.01$, any finding that exists at a probability (p -value) ≤ 0.01 is “significant.” When a finding (such as a relationship between two variables) has a p -value of 0.01, there is a 99 percent probability that the finding exists; that is, in 99 out of 100 cases, the finding is correct. Conversely, there is a 1 percent probability that the finding would not exist; in other words, in 1 out of 100 cases, the finding appears by chance.

IMPRESSIONS OF ART

Prior to asking students about the Chagall work of art, students were asked a few background questions about their impressions of and interest in art. When asked what comes to mind when they think about art, students gave a variety of responses. They were coded into the categories shown below. Columns do not total 100 percent because responses may have been applied to more than one category or did not align with any of the categories.

Overall, students primarily talked about art in relation to materials and mediums or thought about art as involving creativity and imagination.

IMPRESSIONS OF ART

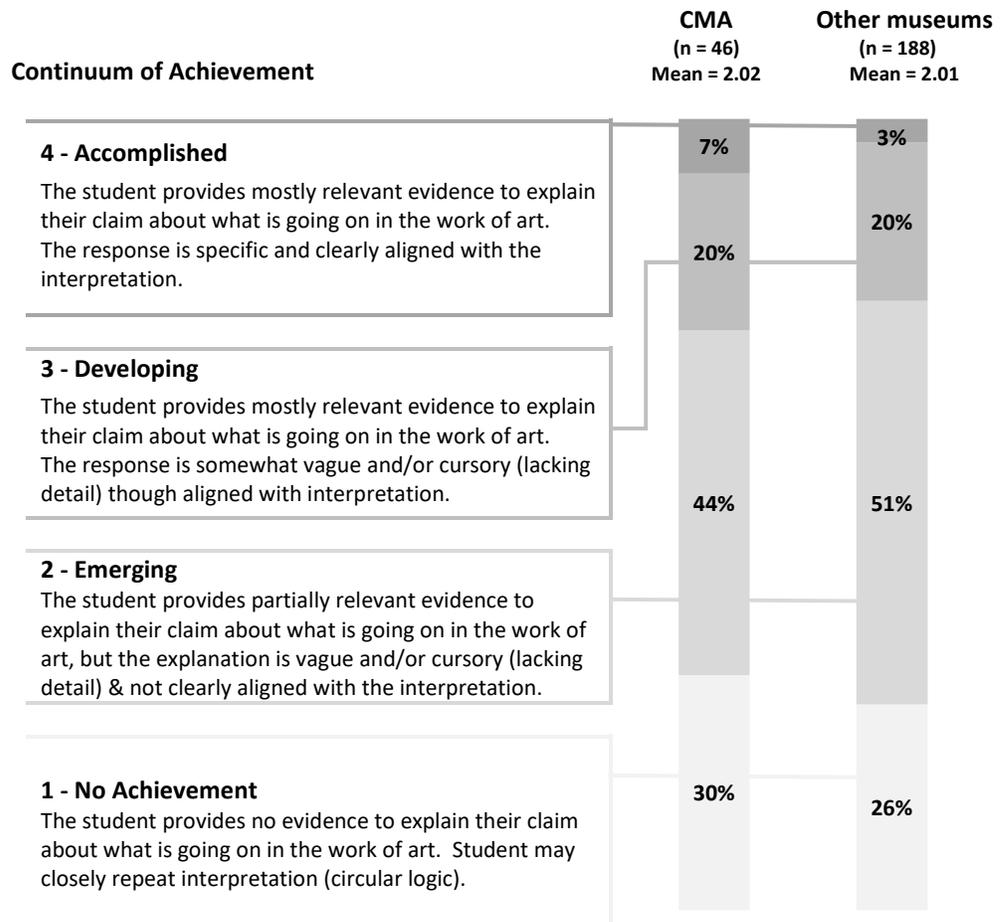
Top-of-mind thoughts about art	% of responses by museum	
	CMA (n = 46)	Other museums (n = 189)
Art can be made with different materials/in different mediums	39	39
Art involves creativity and imagination	20	13
Art evokes an emotion	11	22
I like art (in general)	7	5
Art looks beautiful	4	8
Art is something artists/others make	4	10
Art is something I make	4	5
Art involves craftsmanship or skill	4	5
I don't know/no impression	2	1
Art does not need to be beautiful	0	1

STUDENT CAPACITY RUBRIC MEASURES

USES EVIDENTIAL REASONING

Evidential reasoning, which relates to critical thinking, was measured based on students' responses to the question: "What do you think is going on in this painting?" after being asked to observe and describe the work art. The rubric focuses on alignment and quality of evidence in support of interpretations, not the length of responses (as described in the rubric below). The figure below shows the mean scores by museum and the frequency of responses for each rubric.

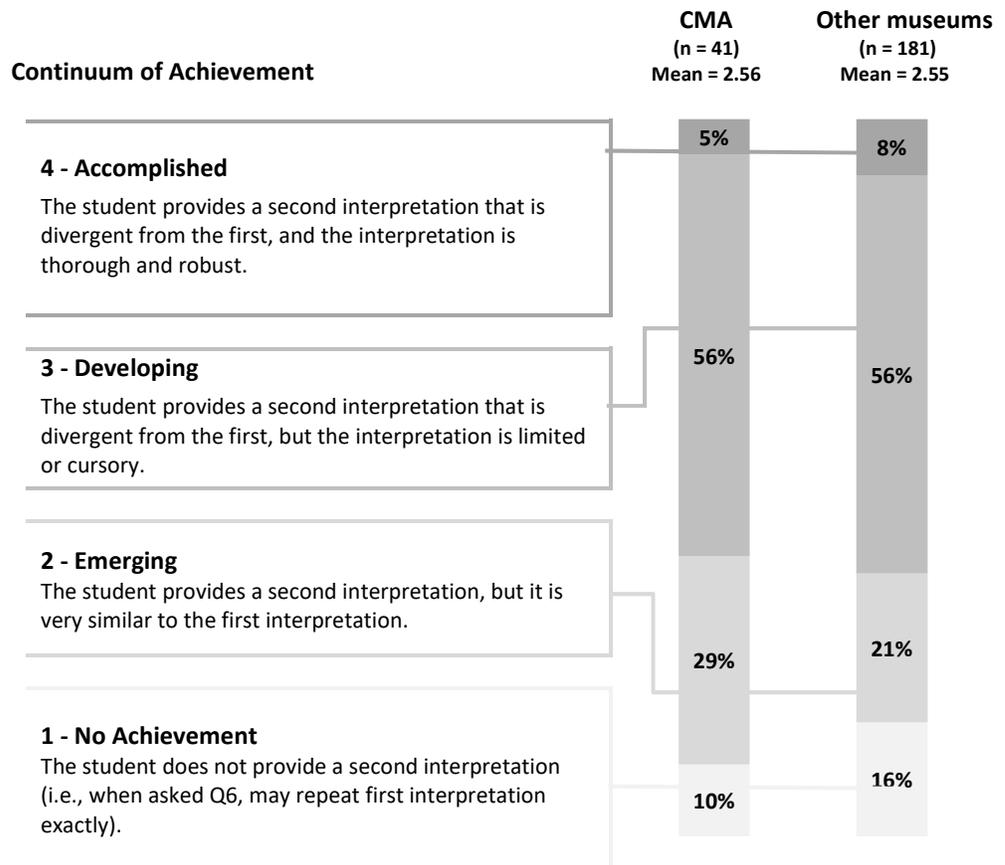
USES EVIDENTIAL REASONING



IMAGINES OR ENVISIONS POSSIBILITIES

Students' ability to imagine or envision possibilities, which relates to creative thinking, was measured based on whether students could generate two different interpretations of what might be happening in the work of art upon being prompted to do so. Emphasis was on the divergence of the second interpretation from the first interpretation and not on how verbose the response was. The figure below shows the mean scores by museum and the frequency of responses for each rubric.

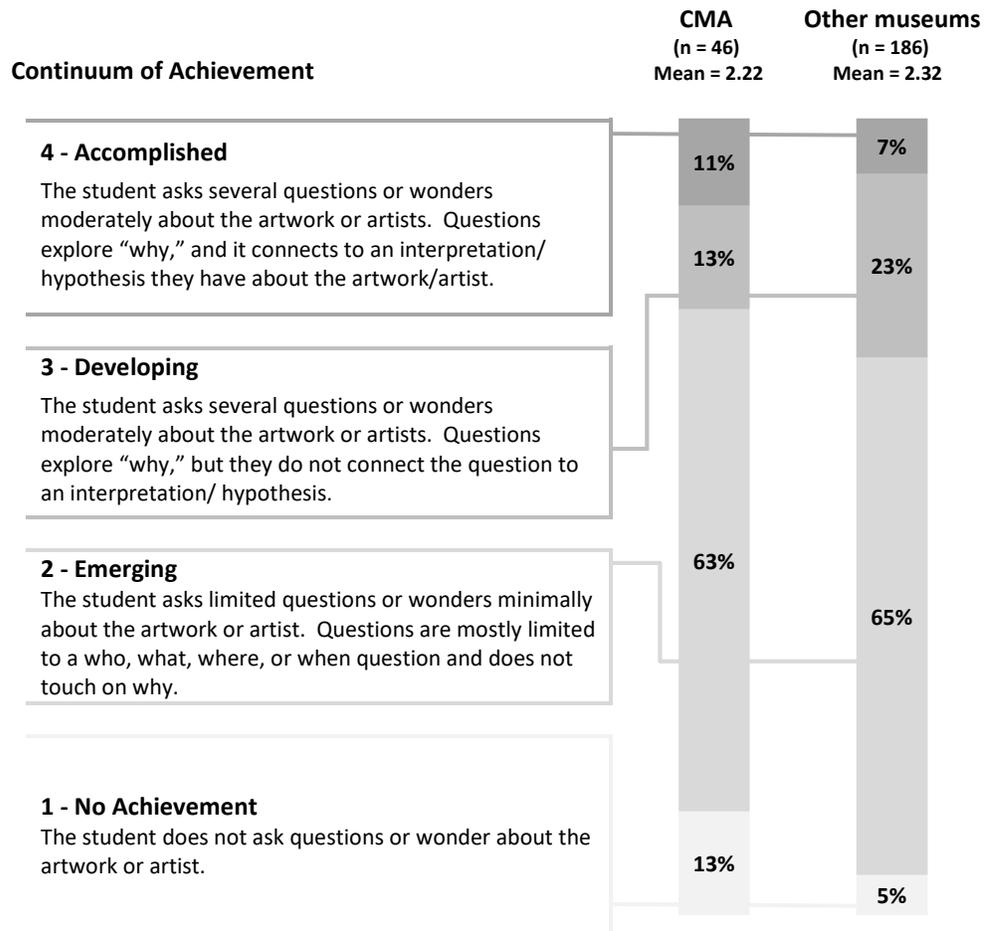
IMAGINES/ENVISIONS POSSIBILITIES



QUESTIONS AND WONDERS

Students' ability to question and wonder, which relates to creative thinking, was measured based on students' responses to the question: "What do you wonder about as you look at this painting?" This measure emphasizes the complexity of the queries (asks a "why" question) and not only the quantity of queries (see the rubric below). The figure below shows the mean scores by museum and the frequency of responses for each rubric.

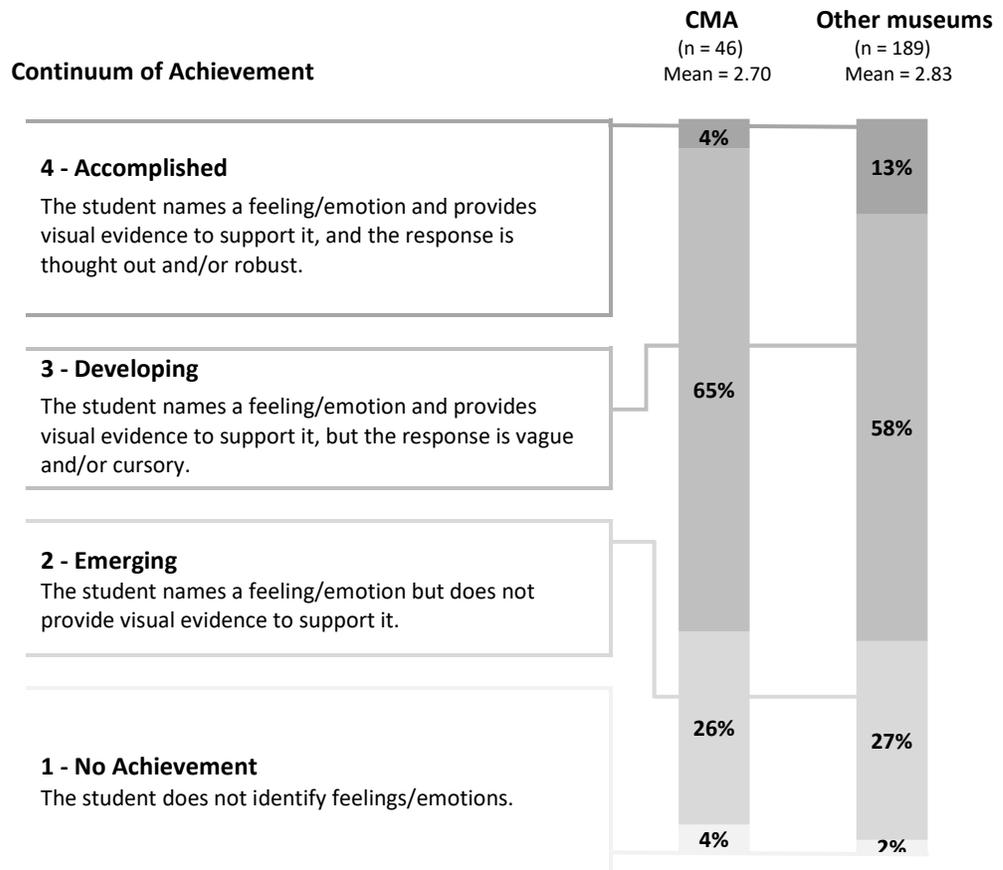
QUESTIONS AND WONDERS



CONNECTS WITH LIVED EXPERIENCE

Students' ability to connect with the lived experience, which is related to the human connection capacity, was measured based on students' responses to two questions. The first question broadly asked students to think about feelings to determine if lived experience came to mind: "What feelings come to your mind when you look at it? What makes you say that?" The second question asked students to place themselves in the position of a figure in the work of art: "Imagine you are [point to blue man]. What do you think that figure is feeling?" The figure below shows the mean scores by museum and the frequency of responses for each rubric.

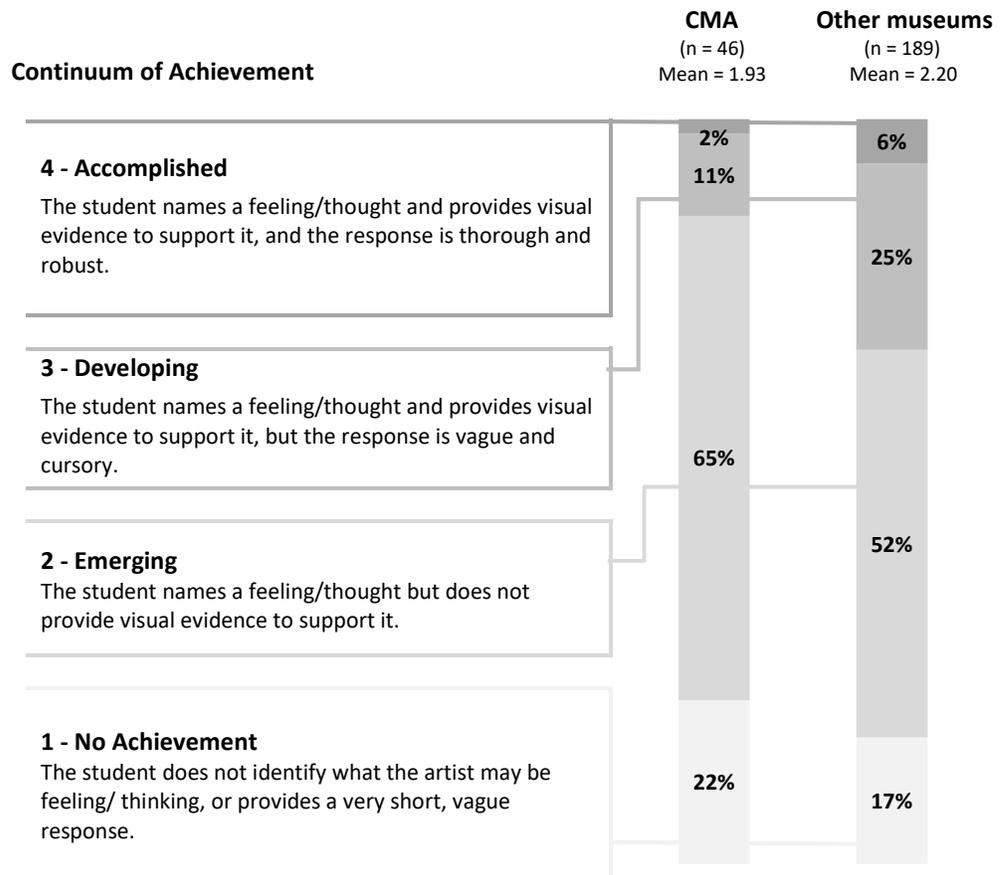
CONNECTS WITH LIVED EXPERIENCE



INTERPRETS ARTIST'S FEELINGS/THOUGHTS

Students' ability to interpret an artist's feelings or thoughts, related to the human connections capacity, was measured based on students' responses to the question: "What could you guess the artist was thinking about or feeling when painting this?" This measure emphasized connecting with the artist in some way and also explaining that connection with evidence from the work of art. The figure below shows the mean scores by museum and the frequency of responses for each rubric.

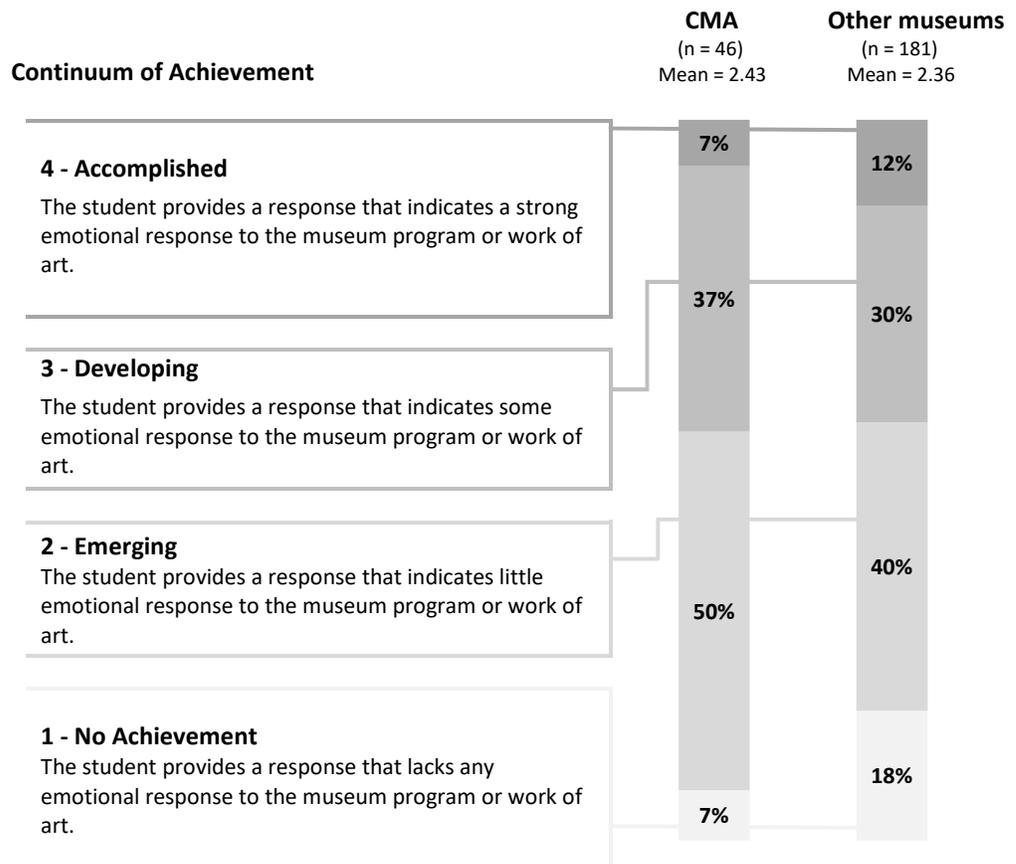
INTERPRETS ARTIST'S FEELINGS/THOUGHTS



RECALLS EXPERIENCE WITH EMOTION

Sensorial and affective responses was measured based on treatment students' responses to two questions about their program experience. The first question ("What part of the visit stands out as the most memorable?") was open-ended to allow students to name any stand-out aspects of the program (e.g., the bus ride). 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?" Scorers did not privilege general experiences versus experiences with works of art. Note that the scorer relied more heavily on the audio than transcripts for scoring to gauge emotion (e.g., rapidness of response, tone of voice, etc.). The figure below shows the mean scores by museum and the frequency of responses for each rubric.

RECALLS EXPERIENCE WITH EMOTION



CONNECTS PROGRAM EXPERIENCE TO LEARNING IN SCHOOL

Academic connections was measured based on treatment students' responses to the question: "Can you tell me in what way your visit to the museum related to what you are learning in school?" The type of connection was not explored in analysis—only the thoroughness with which the connection was described. The figure below shows the mean scores by museum and the frequency of responses for each rubric.

CONNECTS PROGRAM TO SCHOOL LEARNING

