

*Kate Rawlinson has been the assistant director for Education and Public Programs at The Wolfsonian—Florida International University for the past seven years.*

*Susan Nelson Wood is an associate professor and coordinator of English education at Florida State University and director of the FSU Writing Project.*

*Mark Osterman is the education programs manager at The Wolfsonian—Florida International University.*

*Claudia Caro Sullivan is the education research manager at The Wolfsonian—Florida International University.*



## Measuring the Impact of Museum-School Programs: Findings and Implications for Practice



**Stephanie Downey, Jackie Delamatre, and Johanna Jones**

**Abstract** Most museum educators strive for their programs to have positive effects on students, but what impact do they really have? What factors, including museum-school programs, contribute to positive academic performance and critical thinking in particular? This article examines the Guggenheim Museum's artist-in-residence program, Learning Through Art (LTA), as a case study. Over three years, LTA worked with Randi Korn & Associates, Inc. to conduct a quasi-experimental research study examining the impact of the program on critical-thinking skills. Findings showed that LTA positively impacted five of the six identified skills for both looking at art and interpreting text. Drawing on the research findings and a critique of LTA, this article will identify characteristics of a museum-school program that contribute to increased critical-thinking skills specifically and student learning in general.

Most museum educators strive for their school programs to have positive effects on students, but what impact do they really have, and what practices help programs to ensure they will have a positive impact? In this age of standardized testing, museum educators feel the pressure of accountability and assessment. Museum educators believe that their programs have positive effects on student achievement, and ambitious educational aims are common among museum-school programs: increasing students' critical-thinking skills, scientific-thinking skills, communication skills, creativity, and problem-solving abilities.

Until recently, there have been few attempts to rigorously assess whether the goals mentioned above have been achieved. Conducting rigorous educational research is expensive, and funds for such studies typically are not

available to museums. While many small studies indicate that museum-school programs do have positive effects, most museum educators have only intuition or informal feedback to let them know if they have impacted student learning.<sup>1</sup> Without knowing for certain *whether* museum-school programs affect student achievement, it is even more difficult to know *how* museum-school programs affect student achievement.

This article attempts to demystify how museum programs might affect student achievement, and is grounded in the findings of a large-scale, rigorous evaluation of the Solomon R. Guggenheim Museum's Learning Through Art (LTA) program.<sup>2</sup> The three-year study, funded by the U.S. Department of Education's Arts in Education Model Development and Dissemination grant, demonstrates that LTA positively impacted students' critical-thinking skills in regard to looking at and deciphering art, and that these skills transferred to students' ability to interpret text. Drawing on the research findings and a critique of LTA, the authors will consider what characteristics of a museum-school program contribute to increased critical-thinking skills specifically and student learning in general.

## BACKGROUND OF LEARNING THROUGH ART

Over its thirty-seven-year history, the Guggenheim's artist-in-residence program, LTA, has provided art experiences for thousands of students in New York City public elementary schools. The LTA program consists of year-long residencies in which an artist visits a public elementary school twenty times over the course of the school year, working with three classes of students for ninety minutes each on every visit. The residencies are curriculum-based, and artists and teachers collaborate to develop and implement projects that consider the interests, needs, and abilities of students. Participating students also visit the Guggenheim three times during the school year.

The program engages students in both looking at art and hands-on art projects. By making art, students explore important ideas and questions related to the curriculum. Process-oriented explorations of art materials and techniques provide them with the tools to express their ideas visually. Students look at and interpret professional or student art in each session; these conversations are led using guided inquiry. Inquiry uses open-ended questions such as "What do you notice about this painting?" and "What can you guess about the scene in this painting?" to train students in becoming critical viewers and thinkers.<sup>3</sup>

## LEARNING THROUGH ART RESEARCH SUMMARY

While LTA had received positive feedback from stakeholders, it was not until 2003, with the U.S. Department of Education's grant, that the Guggenheim had the opportunity to study the impact of the program on students. The Museum partnered with Randi Korn and Associates, Inc. (RK&A) to examine the effect LTA had on students' academic performance. The study was designed to examine students' ability to describe and interpret art, as well as their ability to transfer these skills to written text.

RK&A employed a quasi-experimental research design, as the Guggenheim Museum purposely selected four schools to participate in the study. Treatment schools—those receiving the LTA program—were schools with which the Guggenheim had long-established relationships but were large enough to provide sufficient teachers and students who had not yet experienced the program. The study established other parameters to limit the variability and strengthen the reliability of the research, including using standardized questionnaires, rubric-scored student interviews, and rubric-scored observations.<sup>4</sup> The focus on quantitative data enabled RK&A to collect responses from many individuals and statistically analyze the data in a variety of ways.

RK&A selected four demographically similar low-income New York City public schools to participate in the study. Within the control schools, 12 third-grade classes were randomly assigned to participate in the study as a control group. Within the test schools, 24 third-grade classes were randomly assigned to participate as a treatment group.

To define and measure the acquisition of critical-thinking skills, LTA staff worked with an advisory team and RK&A to develop a rubric. Based on LTA staff's past experience with the program and the expertise of the advisors—including academics, school personnel, and school administrators—the team defined six critical-thinking skills in the context of the program. The six key skills are: (1) thorough description; (2) extended focus; (3) hypothesizing; (4) evidential reasoning; (5) building schema; and (6) multiple interpretations (see Table 1). Each skill was defined along a continuum from beginning, to developing, to accomplished.

Students were asked in one-on-one interviews to talk about a work of art and a brief excerpt from a young-adult novel. The interviews were audio recorded and transcribed, and then scored using the LTA critical thinking rubric. Data were collected from one set of third-graders in 2004–05 and a



Figure 1: Third-grade student at Public School 148 in Queens, New York, creating a plaster monument as part of the Guggenheim Museum's Learning Through Art program. Photo by Enid Alvarez.

second set of third-graders in 2005–06. A total of 565 students completed interviews.

Results of statistical analyses were impressive.<sup>5</sup> RK&A found that treatment group students scored higher than control group students on five of the six literacy characteristics for their responses to the work of art and the text, thus demonstrating transfer of knowledge (see Table 1). Additionally, when RK&A examined fourteen variables that potentially impact student learning, including students' attitudes and demographic characteristics, the researchers found that only two—word count and participation in LTA—predict higher scores for both responses to the work of art and the text. RK&A was not surprised by the fact that students who used more words during the interview scored higher on the literacy skills than those who used fewer words. What is noteworthy is that once the statistical analysis controlled for word count, the only other variable that impacted students' scores was participation in LTA. None of the other large-scale museum-school program evaluations RK&A has conducted have demonstrated such a strong

correlation between a program and student learning.<sup>6</sup> The study demonstrates that students who participated in LTA were able to better articulate their thoughts and express more sophisticated responses to both a work of art and text than students who did not participate in LTA. More importantly, students who participated in LTA were able to apply skills learned in an art context to a language arts context and become better readers.

### PROGRAM FACTORS THAT CONTRIBUTE TO INCREASED CRITICAL-THINKING SKILLS

When the Guggenheim and RK&A began this study, the authors and others on the research team were unsure whether we would find evidence of knowledge transfer.<sup>7</sup> The findings surprised us and, in the wake of this research, we were left wondering what implications findings might have for other museum-school programs.

The strong impact of LTA on students prompted the authors to examine the program itself so as to identify the program components that contributed to increased critical-thinking skills in students. We believe that there are three aspects of LTA that contributed to the positive research findings: (1) program management; (2) teaching strategies; and (3) program structure.

#### Program Management

An important component of any education program is the overall management of the program. But too often program management functions in survival mode because programs are understaffed, underfinanced, and mired in the day-to-day details of operations. Yet, in the context of high-stakes educational goals, museum-school programs more than ever need a solid management system that includes time for planning, assessment, oversight, and professional development.

**Planning:** A key component of the success of the research study was that LTA had concrete, measurable outcomes. Guggenheim staff, with the assistance of RK&A, spent two years developing and refining a program rubric. During that time, Museum staff agreed upon stated goals, and carefully considered what success might look like in a classroom where this program was being presented. Rather than relying on a textbook definition of inquiry or creativity, for example, or on another program's approach, Guggenheim staff

**Table 1: Differences in Students' Critical-thinking skills: Learning Through Art Program Research Findings, 2004-2006**

Critical-thinking skills	Artwork	Text
<b>Extended Focus:</b> Student adds details after the initial description and asks questions linked to description and/or interpretation.	*	*
<b>Hypothesizing:</b> Student proposes a specific explanation to give meaning to or to explain what is happening in the artwork/text.	*	*
<b>Multiple Interpretations:</b> Student revises or adds to his/her explanation in such a way as to generate new ideas or themes. Student uses words that reveal his/her awareness of subjectivity such as, "I think," "possibly," "One way to think of it is."	*	*
<b>Evidential Reasoning:</b> Student supports his/her explanation by providing relevant evidence directly from the artwork/text.	*	*
<b>Schema-Building:</b> Student makes strong connections between his/her explanation and prior knowledge and/or personal experience. The connections are logical and specific.	*	
<b>Thorough Description:</b> Students' description is specific to the artwork/text, description directly references aspects of the artwork/texts, and the description evokes a complete, clear mental picture of the artwork/story to the listener.		*

\* Indicates area of critical thinking in which students who participated in LTA scored higher than students who did not participate in LTA.

and RK&A developed a program rubric that defined successful teaching and learning according to LTA program goals. When the Guggenheim received the U.S. Department of Education grant, staff formed an advisory committee of academics, school personnel, and school system administrators to define critical-thinking skills in observable, measurable terms and to refine the LTA program rubric to measure those skills.

While most museum-school programs do not have the luxury of time or funding to spend a year refining a program and its outcomes, integrating planning and goal-setting into the operation of a program on a smaller scale can be immensely useful. Even one day of gathering staff and stakeholders can start a conversation about what a good program is and help develop a vision beyond the day-to-day concerns. Most importantly, programs need to

define clear goals and objectives, and think critically about how they can realistically achieve them. As obvious as it may seem, it is essential to put all this in writing (such as a rubric) and refer back to it often. And, as time-consuming as it may be, each unique program requires its own unique assessment tool; tests and evaluation instruments that are not based on your own program goals—such as statewide standardized tests or evaluation tools borrowed from other programs—will often not measure what you are doing best.

**Assessment:** Aligned with developing goals and objectives is continual reflection and assessment. LTA staff members regularly meet with teaching artists to give performance feedback based on the rubric. In addition, staff meets annually to reflect on the program's progress toward reaching its goals and make changes and improvements accordingly.

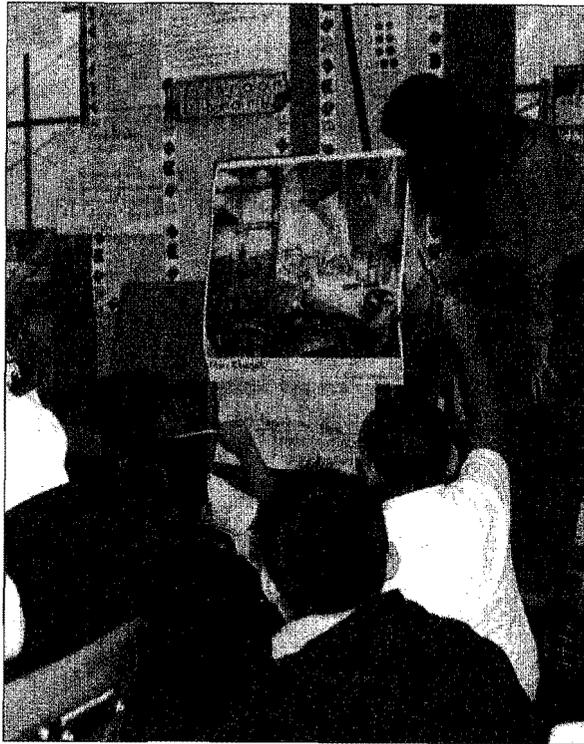
In the hectic day-to-day running of a museum-school program it is easy to overlook or forget program goals and objectives. However, constant assessment helps program staff be proactive rather than simply respond to daily crises. Additionally, regular assessment is key to maintaining relationships with program stakeholder outside of the museum such as funders, school districts, teachers, and parents.

**Program Oversight:** Successfully implementing a program relies on oversight not only to provide close monitoring and support, but also for relationship building and development of trust. Because oversight functions take considerable staff time, the Guggenheim limits the number of schools it works with by having multiple residencies in one school. This way, the Museum and the school develop a strong relationship. One staff person is assigned to each school, and staff members conduct two to three observations of each residency at their schools. As a result the program can respond to the unique needs of each school, manage everyone's expectations, and give support to teaching artists.

Every museum-school program must work within its limits; however, at the core of this oversight is communication and support. Open communication among program staff, school staff, and the people responsible for implementing the program—such as teaching artists, docents, or museum educators—is essential to being able to achieve ambitious program goals.

**Professional Development:** Training those who are responsible for implementing a program, whether they are docents, volunteers, educators, or

Figure 2: Sonya Radovich, third-grade teacher at Public School 148 in Queens, New York, leading an inquiry with her students. Sonya was one of six teachers trained in inquiry through the "Teaching Literacy Through Art" project. Photo by Jackie Delamatre.



artists, according to how the program staff has defined its goals and objectives, is essential to reaching these goals. The Guggenheim provides several training sessions a year for teaching artists, including two to four full days of training each fall, as well as a day devoted to collaborative planning between teaching artists and classroom teachers. This professional development (combined with low staff turnover and frequent feedback) ensures that teaching artists are correctly implementing the methods the program promotes, an important consideration for any program implemented by volunteers or part-time staff.

### Teaching Strategies

A second crucial element to a successful museum-school program is the teaching strategies it utilizes. With the goal of enhancing students' critical-thinking skills, LTA, like many museum-school programs, employs two main approaches to teaching: inquiry and hands-on art-making.

**Inquiry:** LTA uses a form of inquiry that is theme-based, rather than being entirely open-ended. In LTA, teachers give information about each work of art to be discussed, and this information is essential to facilitating students' understanding. When, for instance, a student looks at *Paris through the Window* by Marc Chagall during a visit to the Guggenheim or in the classroom, she is first encouraged to spend time noticing details—the blue two-faced man in the corner, the cat with the human face on the windowsill, and the upside-down train beyond the windowpanes. Then she is asked what she can guess about this place, to which she might respond that the place is part real and part fantastical, or that it is in Paris, or that it is a place where strange things happen. And she is always asked to back up her interpretations with evidence. At this point, the teacher will tell the students something about the painting to deepen their insights, such as that Chagall had recently moved to Paris from his hometown in Russia to live the life of an artist. This information is followed with a question that allows students to synthesize new ideas with their initial observations and interpretations. Through inquiry with art, LTA strives to teach students, first, how they can analyze artwork in order to understand media and themes that they will use in their own art-making; and, second, how to apply critical-thinking skills to both art and text.

The connection between using inquiry with art and critical-thinking skills is also supported by previous research. A study by Shari Tishman, Dorothy MacGillivray, and Patricia Palmer demonstrated that critical-thinking skills gained through interpreting works of art can transfer to deciphering scientific images, in this case fossilized footprints.<sup>8</sup> Students in this study who had experienced inquiry-based art lessons were more likely than control students to use evidence to support their interpretations of the fossil, less likely to use circular reasoning (giving evidence that repeats the interpretation), and more likely to be aware of the subjectivity or conditional nature of their interpretation. Furthermore, more recent research at the Isabella Stewart Gardner Museum has found that students gained critical-thinking skills in their multi-visit program.<sup>9</sup>

**Art-Making:** The bulk of any ninety-minute LTA session is dedicated to creating art. Projects are long-term, often taking as long as twenty weeks to complete. During these projects, students explore the qualities and possibilities of materials, and use these materials to respond to an inquiry-based prompt that relates to their curriculum—for example, "What are animals'?"



Figure 3: Students discussing James Rosenquist's *President Elect* (1960–1961/1964) on a tour of the Guggenheim Museum. Photo by Chi Chi Ubiña, courtesy of the Solomon R. Guggenheim Museum.

lives like, and how are they similar to and different from ours?" or "How do writers and artists affect, change, or impact the world we live in?" Reflection is incorporated throughout the project, so that students are always challenged to observe and interpret their own work and that of their classmates, and to make changes that further the ideas and intent of the artist. Students are asked to think critically about their ideas and their artistic choices, as well as about material related to their curriculum.

There are undoubtedly many models for bringing critical thinking into the art-making process. It is important to consider how art making can teach these skills, and then frame the program so that students are learning to think critically throughout all activities.

### Program Structure

The third and final aspect that we would like to discuss is the structure of a program. Opportunities for successive, prolonged, and uninterrupted engagement are essential for creating an environment conducive to developing

higher order thinking skills. As noted in *Champions of Change*, a critical factor of successful arts programs is time.<sup>10</sup> A skill such as critical thinking is not learned in a day, or even a week. It is a skill that requires a great deal of practice.

**Multiple Visits:** Traditionally museums have served school audiences through a range of single-visit tours, in part because of admission metrics that favor serving the maximum number of students possible. Providing multiple-visit programs decreases the number of students a museum can serve, and as museums begin offering these kinds of programs, staff (and funders) will need to change their criteria for success from counting the number of program attendees to measuring the quality of the experience and the effect on students. Findings from our study and others, including those at the Isabella Stewart Gardner Museum and at the Wolfsonian Museum discussed in this *Journal of Museum Education* issue, clearly demonstrate the strong impact multiple-visit programs can have on students.

**Length of Session:** Implementing a program across time through multiple sessions is important, but equally essential is providing adequate time in each session for in-depth teaching and learning. Each LTA weekly session is a ninety-minute block. This leaves significant time for inquiry as well as art exploration in each lesson. In the public school classroom it is very unusual to have the leisure of studying one subject for such a long block of time. For museums developing long-term programs, it is worth including time specifications into the agreements with schools.

### CONCLUSION

There are undoubtedly other variables that impact student achievement, and each museum-school program exists within its own unique circumstances, making one size fits all impossible. Further, it would be foolhardy to try to prioritize the three variables discussed in this article. It is really the combination of all three that is necessary. For example, multiple-visit programs that do not have strong program oversight and cultivate solid relationships with participating schools will face myriad obstacles, including disruptions in schedules, limited access to students, and resistant classroom teachers or parents. Similarly, even programs that employ highly-trained educators who use inquiry methods can only have limited impact if they work with a

classroom of students just once or twice. And, of course, a program is likely to wander off track if it lacks clearly defined goals and objectives as well as built-in time for reflecting on them. For LTA, the combination of all the factors resulted in a strong program that had a real, measurable impact on student achievement. We encourage other museums to reflect on their school programs from an organization perspective and to study their programs' effect on students. We posit that with attention to the variables discussed in this article it is possible for many museum-school programs to have similar impact.

## Notes

1. Susan Witmer, Jessica Luke, and Marianna Adams, "Exploring the Potential of Museum Multiple-Visit Programs," *Art Education* 53, no. 5 (2000): 46-52; Randi Korn & Associates, Inc., "Bridging Communities Program Evaluation" (unpublished report, National Museum of Women in the Arts, Washington, DC, 2004); Randi Korn & Associates, Inc., "Thinking Through Art Program Evaluation" (unpublished report, Rubin Museum, New York, 2005).
2. Randi Korn & Associates, Inc., "Teaching Literacy Through Art Final Report: Synthesis of 2004-05 and 2005-06 Studies" (unpublished report, Solomon R. Guggenheim Museum, New York, 2007).
3. For more information on inquiry techniques used by LTA, as well as sample art projects, visit <http://www.learningthroughart.org>.
4. See the methodology section of "Teaching Literacy Through Art Final Report: Synthesis of 2004-05 and 2005-06 Studies" for a detailed description of the parameters.
5. RK&A employed analysis of variance, analysis of covariance, and stepwise multiple regression. All differences between treatment and control groups reported in this article are statistically significant at the  $p < 0.05$  level.
6. Randi Korn & Associates, Inc., "Dinosaurs and More School Tour Evaluation: Findings from Questionnaires, Interviews, and Observations" (unpublished report, Yale University, Peabody Museum of Natural History, New Haven, CT, 2004), "Artists' Choices School Tour Evaluation" (unpublished report, National Gallery of Art, Washington, DC, 2002), and "United States Holocaust Memorial Museum Evaluation of School Programs" (unpublished report, United States Holocaust Memorial Museum, Washington, DC, 1999).
7. The other research team members were Sharon Vatsky and Rebecca Shulman Herz of the Solomon R. Guggenheim Museum, Randi Korn of Randi Korn & Associates, Inc., and Margaret Menninger, an independent statistical consultant.
8. Shari Tishman, Dorothy MacGillivray, and Patricia Palmer, "Investigating the Educational Impact and Potential of The Museum of Modern Art's Visual Thinking Curriculum: Final Report" (unpublished report, Harvard Project Zero, Boston, 1999).
9. Marianna Adams and others, "Thinking Through Art: Isabella Stewart Gardner Museum School Partnership Program, Year 3 Research Results" (research report, Isabella Stewart Gardner Museum, Boston, 2007).
10. Edward B. Fiske, ed., *Champions of Change: The Impact of the Arts on Learning* (Washington, DC: Arts Education Partnership, 1999).

*Stephanie Downey, the managing director of Randi Korn & Associate's New York office, specializes in qualitative research and has worked with the Guggenheim Museum to evaluate Learning Through Art and develop the program rubric. She has also developed rubrics for education programs of numerous other museums.*

*Jackie Delamatre is the former program coordinator for Learning Through Art where she was hired to coordinate the three-year research study, Teaching Literacy Through Art. She is currently a freelancer educator and writer for the Guggenheim Museum, the Museum of Modern Art, and the International Center of Photography in New York City.*

*Johanna Jones, the managing director of Randi Korn & Associate's California office, specializes in quantitative research and has worked with the Guggenheim Museum, the National Gallery of Art, and numerous other informal learning institutions to study the impact of museum programs.*

