



Teacher Practice and Student Outcomes in Arts-Integrated Learning Settings: A Review of Literature

Submitted to the
Wolf Trap Foundation for the Performing Arts
Early Childhood STEM Learning Through the Arts
Project

Rose Goff
Meredith Ludwig
American Institutes for Research

Teacher Practice and Student Outcomes in Arts-Integrated Learning Settings: A Review of Literature

Fully Funded by a \$1.15 million Grant From the U.S. Department of Education,
Arts in Education Model Development and Dissemination Grant Program

Submitted to the Wolf Trap Foundation for the Performing Arts
Early Childhood STEM Learning Through the Arts Project

February 22, 2013

**Rose Goff
Meredith Ludwig**



AMERICAN INSTITUTES FOR RESEARCH®

1000 Thomas Jefferson Street NW
Washington, DC 20007-3835
202-403-5000 • TTY 877-334-3499
www.air.org

Copyright © 2013 American Institutes for Research. All rights reserved.

The contents of this publication were developed under a grant from the U.S. Department of Education. However, those contents do not necessarily represent the policy of the U.S. Department of Education, and you should not assume endorsement by the federal government.

1206_02/13

Contents

| | Page |
|---|-------------|
| Executive Summary | 1 |
| I. Results of Constructs Review | 2 |
| II. Recommendations | 3 |
| III. Paper Organization..... | 3 |
| Chapter 1: Arts Integration Writ Large..... | 4 |
| Historical Context for Arts Integration | 4 |
| The Use of Teaching Artists | 6 |
| Moving Into the 21st Century | 7 |
| Assessment of Arts Knowledge | 9 |
| Chapter 2: Literature Review Process..... | 12 |
| Types of Constructs | 13 |
| The Focus of the Review: Teacher Practice and Student Learning Constructs | 13 |
| Process of Review..... | 14 |
| Chapter 3: Identifying Constructs in the Literature—Teacher Practice | 16 |
| Pedagogy..... | 17 |
| Measuring Changes in Pedagogy..... | 18 |
| Teachers’ and Teaching Artists’ Practice: Consistency With Arts Integration Program Goals | 20 |
| Changes in Teacher Perceptions and Attitudes..... | 21 |
| The Background of Teachers and Teaching Artists..... | 22 |
| The Role of Teaching Artists..... | 22 |
| The Depth and Type of Support Offered to Teachers by Teaching Artists | 22 |
| The Quality of the Relationship and Collaboration Between Classroom Teacher and Teaching Artist Partner | 23 |
| Time for Coaching, Planning, and Coordinating | 25 |
| Tools for Measuring Teacher Practice Outcomes..... | 25 |
| Chapter 4: Identifying Constructs in the Literature—Student Learning | 27 |
| Changes in Art-Content Mastery | 27 |
| Changes in Academic, Nonart Content Mastery..... | 28 |
| Changes in Social Emotional Learning and Attitude/Behavior | 29 |
| Changes in Other Student Attitudes/Behaviors | 31 |
| Changes in Process Abilities, Such as Creativity or Critical Thinking | 31 |

| | |
|--|------|
| Chapter 5: Findings, Implications, and Recommendations | 35 |
| Recommendation 1 | 36 |
| Recommendation 2 | 36 |
| Recommendation 3 | 37 |
| Recommendation 4 | 38 |
| Recommendation 5 | 39 |
| References..... | 40 |
| Appendix A: Descriptions of Large-Scale Arts-Integration Programs..... | A-1 |
| Appendix B: Tools for Measurement and Resources | B-1 |
| Tools for Measuring Teacher Practice Outcomes..... | B-1 |
| Tools for Measuring Student Social Emotional Outcomes..... | B-3 |
| Assessments That Measure Student Process Outcomes | B-4 |
| Discussion..... | B-10 |
| Other Helpful Resources..... | B-10 |

Executive Summary

The Wolf Trap Foundation for the Performing Arts is offering a research-based program of professional development (PD) that equips teachers to use *arts integration* strategies in their early childhood classrooms.¹ The program is the Early Childhood STEM² Learning Through the Arts project, funded by the U.S. Department of Education, a four-year Arts in Education Model Development and Dissemination (AEMDD) grant program. *Arts integration* refers to instruction that integrates content and skills from the arts with content and skills from other core subjects, toward increasing learning in both areas (Ruppert & Habel, 2011). For instance, a teacher might integrate mathematics and music by teaching number sense and rhythm together so that learning in one subject enhances learning in the other.

Wolf Trap’s PD program includes annual summer institutes as well as in-classroom coaching time. In the multiday summer institutes, teaching artists and teachers work in teams to develop standards-based performing arts and mathematics activities. During the coaching time, teachers and teaching artists work together in pairs, a research-based strategy often called the *artist residency model* (Burnaford, 2007). Twelve teaching artists from the performing arts fields of dance, music, and drama participate in the grant. American Institutes for Research (AIR) is conducting an evaluation of the program implementation and impact, focusing on changes in teacher practice as a result of the PD and improved student knowledge of mathematics.

Research indicates that arts integration has great potential for student learning in multiple disciplines (Burnaford, 2007). However, measuring the results of arts integrated instruction remains a challenge, and the literature indicates that more research is needed to address how to measure the effects of arts-integration efforts (Herpin, Quinn, & Li, 2012; Horowitz & Webb-Dempsey, 2002). As a component of our evaluation work, we conducted a review of key literature in 2011–12, exploring the measurement of teacher practice and student learning in arts-integrated settings. We focused the search on the following three key questions:

- What constructs (e.g., outcomes, features, characteristics) have other researchers measured when trying to capture the contributions of arts-integration efforts?
- What gaps persist in knowledge or tools for assessment?
- What are the implications for our own evaluation?

To answer these questions, we looked at a variety of materials: literature reviews, research compendiums, research syntheses, essay collections, books, program evaluations, impact studies, and metastudies.

¹ As of the 2012 allocation, the U.S. Department of Education Arts in Education Model Development and Dissemination Grant Program has awarded Wolf Trap Foundation \$876,504 in support of research and implementation of the Early Childhood STEM Learning Through the Arts project in collaboration with Fairfax County Public Schools (VA).

² STEM denotes science, technology, engineering, and mathematics; the Wolf Trap program we are evaluating focuses on mathematics.

In the literature review, our primary purpose was to identify constructs that other researchers have identified as important and measured when presenting the results of the arts-integrated approach for teacher practice and student learning.

Our secondary purpose was to produce information for teachers, program designers, and evaluators who are participating in arts-integration initiatives. We sought to present useful tools as well as the broader implications of our work for future research and evaluation studies. We were particularly interested in arts-integration efforts at the early elementary school level, in light of our work with the Wolf Trap Foundation. We also anticipated that our search would allow us to improve the specificity of constructs in our logic model and to refine the analysis approach for qualitative data collected by teaching artists.

This paper presents the results of our search. Following, we summarize the review findings.

I. Results of Constructs Review

Arts-integration-focused research and evaluation is concerned with the following four categories of constructs:

- District-, school-, or program-level constructs
- Professional development constructs
- Teacher practice constructs
- Student learning constructs

We focused on two of these categories, **teacher practice** and **student learning**, in light of our guiding questions. We found that in each of these categories, a wide variety of constructs have been measured in the literature.

For **teacher practice**, we organized constructs into two groups.

1. Constructs in the first group focus on characteristics of an individual classroom teacher or teaching artist. These characteristics include changes in **pedagogy**, changes in **attitudes**, **fidelity** to program, and **teacher background**.
2. Constructs in the second group focus on characteristics of collaboration between classroom teachers and teaching artists. These characteristics include the depth and type of **support** offered to teachers by teaching artists, the quality of the **relationship** and collaboration between classroom teacher and teaching-artist partner, the amount of **time** that classroom teachers and teaching artists have available to plan, the extent to which there is an **expectation** that this planning will take place, and the way teaching artists and other school staff members view the **role of teaching artists** within the school.

For **student learning**, we found that constructs measured in the literature can be grouped into one or more of five categories: changes in **art content** mastery; changes in **academic**, nonart content mastery; changes in **social emotional learning**; changes in **attitude/behavior**; and changes in “**process**” **abilities**, such as creativity or critical thinking. Some studies focus on

outcomes for specific subgroups of students, such as English language learners, underperforming students, economically disadvantaged students, or urban students.

II. Recommendations

The literature review led us to offer five recommendations. In brief, our recommendations include the following:

1. Program designers, evaluators, and researchers should consider the broad spectrum of constructs that can be measured when making decisions about designing, evaluating, or studying an arts-integration initiative.
2. Researchers should develop common definitions for each of the constructs in this spectrum, basing these definitions on theory and empirical work in the field.
3. A comprehensive and scientific review of the literature (studies and evaluations of arts integration) should be launched. Such a review will make it possible to determine the extent to which there is cumulative evidence of a link between arts integration and student outcomes.
4. Researchers should develop tools or instruments that are *not specific* to a particular arts integration program to assess changes in student outcomes after arts-integrated instruction—including changes in process abilities and changes in social emotional learning and attitude/behavior.
5. Researchers should develop a *non-program-specific* framework or rubric that would (1) pinpoint measurable aspects of quality arts-integrated instruction and (2) offer an overall measurement of the quality of a given interval of a teacher's arts-integrated instruction.

III. Paper Organization

Chapter 1 addresses arts integration writ large. Chapter 2 describes our review process. Chapter 3 presents constructs that other researchers have measured when studying **teacher practices** and arts integration. Chapter 4 presents constructs that researchers have measured when studying **student outcomes** in arts-integrated learning settings. Finally, Chapter 5 draws conclusions and proposes recommendations. Appendix A includes descriptions of multischool integration programs, and Appendix B includes descriptions of tools for measurement and resources.

Chapter 1: Arts Integration Writ Large

Historical Context for Arts Integration

Education in art was valued historically as a distinct, discipline-specific area of learning. Over time, it has become thought of as a contributor to learning across disciplines (Wakeford, 2004).

Burnafor (2007) offers a summary of the history of arts-integrated curricula. Her review explains that in the early 20th century, the organization of subjects as discrete, nonintegrated entities was pervasive but was beginning to be challenged by academics such as John Dewey and his colleague William Kilpatrick. Kilpatrick's concept of a "project method" is considered a precursor to today's conception of integration. Kilpatrick discussed the concept in his 1918 article, *The Project Method*, which describes an approach to learning in which the interests of children would be the themes of study (Burnafor, 2007). Dewey responded to this concept in 1931 in a speech at Harvard University. He argued that neither of the two ways of organizing curriculum—by project (Kilpatrick's conception) or by subject (the common conception)—would clear up confusion on the subject of how to organize curricula. Dewey proposed that, instead, subjects should be reorganized so that "the interdependence of knowledge and the relationship between knowledge and human purpose would be made clear" (Kliebard, 2004). There should be, he argued, a study of the "interrelations of subjects with one another" to determine how they might together enrich intellectual studies (Kliebard, 2004). In parallel with this thinking, the National Council of Teachers of English (NCTE) issued a report titled *A Correlated Curricula* (1936), which described a "democratic education that combined subject-specific learning with interdisciplinary and integrated options for learning at the secondary level," an orientation that is consistent with current practices in arts integration (Burnafor, 2007, p. 2).

Historian Michael Wakeford's account, *A Short Look at a Long Past* (2004), traces the evolution of justifications for arts education in the American education system, where arts education also includes arts integration. He cites various 20th-century thinkers' justifications for the importance of arts education, such as the following:

- The fact that arts learning fosters competencies that are useful in a variety of contexts, such as creativity, risk taking, and seeing multiple solutions
- The value of practical and skill-based learning
- The idea that arts-rich curricula contribute to a student's self-identification as a learner, facilitating the process of learning itself

Such justifications for arts learning have been adopted over time as political rationales for supporting arts education (Wakeford, 2004). For instance, in the 19th century, Horace Mann, the education reformer and U.S. legislator, drew on the thinking of Heinrich Pestalozzi in supporting the inclusion of drawing in curriculum, suggesting that it improves students' perception, appreciation for beauty, and capacity for moral uplift (Efland, 1990, as cited in Wakeford, 2004).

In the mid-20th century, *problem-based learning* and *inquiry learning* were conceived, according to Burnafor (2007). These strategies are based on the concept that the questions

students ask to solve a problem embody an approach to learning that is multidisciplinary and relevant to the real world, an idea that continues to be applied in arts-integrated practices today (Burnaford, 2007). In the 1960s, the general term *curriculum integration*³ began to be used, especially in middle schools (Beane, 1997, as cited in Burnaford, 2007). More recently, advocates such as Beane (1997) have argued that schools should move away from the subject-centered curriculum structure and adopt a full integration model. Beane (1997) explains that people solve problems using whatever knowledge is needed, not the knowledge of just one specific discipline (Burnaford, 2007).

At a certain point, the development of these ideas would intersect with a policy focus on low-performing schools. By the 1980s, reformers had established that many urban school systems were failing to meet the needs of students. A large percentage of children were not mastering reading and basic mathematics skills (Seidel, Tishman, Winner, Hetland, & Palmer, 2009). Providing support for these students became the priority for school reform, and the role of the arts in the K–12 curriculum competed with funding exigencies. The *Qualities of Quality* (Seidel et al., 2009) report notes that the infrastructure for in-school arts learning in the United States has been weakened in the past century, according to some arts-in-education experts, with a singular focus on additional instruction time for core subjects of reading and mathematics. Most schools do not have full-time arts teachers for all arts disciplines, and many schools lack even one arts specialist (Seidel et al., 2009, p. 52).

Art was included as a core subject in the 2001 No Child Left Behind (NCLB) Act; however, in the opinion of many observers, the law did not strengthen arts education (Seidel et al., 2009). It instead continued to put pressure on districts to focus on meeting standards in reading and mathematics, and many districts reduced or eliminated arts offerings (Seidel et al., 2009, p. 6). Private foundations have been able to help fill the need for funding in the arts, mitigating the lack of federal support: The Annenberg Foundation, the Kenan Institute for the Arts, and the Wallace Foundation are three of many examples (Rabkin & Redmond, 2004). The Wallace Foundation has funded both districtwide efforts and studies of community capacity regarding arts support (Bodilly, Augustine, & Zakaras, 2008).

To address the needs of struggling schools, many districts across the country have implemented reform efforts, such as comprehensive school reform models. Despite the trend of diminishing arts opportunities, a few reform efforts included arts integration as an approach to reform. The multistate A+ Schools program, for instance, is considered a “whole school reform model” in itself, with the vision of creating enhanced learning opportunities for students by using arts-integrated instruction. It is discussed thoroughly in *Creating and Sustaining Arts-Based School Reform: The A+ Program* (Noblit, Corbett, Wilson, & McKinney, 2009), which explores how the incorporation of the arts into the identity of a school can be a key to its resilience in reform. Other arts-integration programs have been components of school reform efforts, although not considered “whole school reform models” themselves. Such arts-integration programs have also

³ Beane (1997) defines *curriculum integration* as a curriculum design that is concerned with enhancing the possibilities for personal and social integration through the organization of curriculum, based on significant problems and issues and without regard for subject-area boundaries.

been successful in schools that are not low performing. Other examples of multischool arts-integration programs include Chicago Arts Partnerships in Education (CAPE), Arts for Academic Achievement (AAA), the Transforming Education Through the Arts Challenge (TETAC), Arts in the Basic Curriculum (ABC), the Center for Arts Education (CAE), and the Guggenheim Museum’s Learning Through Arts Program (LTA). In general, large scale, arts-integration programs include implementation at the elementary level (Seidel et al., 2009; Burnaford, 2007).

The Visual Thinking Strategies (VTS) curriculum, a unique curriculum and teaching method that focuses on using art to develop critical thinking and visual literacy skills, is also being implemented on a large scale at more than a hundred schools (VTS, 2012d).

Teaching that integrates arts strategies, processes, or modes of learning also can be found in classrooms or schools that are not involved in an arts-integration program. This situation is especially true in early childhood classrooms, where integrated subjects are common (Cross, Woods, & Schweingruber, 2009). Research has shown that the arts experience of young children can play a key role in their cognitive, motor, language, and social-emotional development (Taskforce on Children’s Learning and the Arts: Birth to Age Eight & Goldhawk, 1998). Further, it is considered developmentally appropriate practice for teachers of young children to use curricula that integrate learning both “*within* and *across*” the domains—physical, social, emotional, cognitive—and the disciplines—including art and music, language, literacy, mathematics, social studies, science, physical education, and health (National Association for the Education of Young Children, 2009).

The Use of Teaching Artists

Many arts-integration programs have adopted a model in which teaching artists are used (Booth, 2003; Burnaford, 2007; Freeman, Seashore, & Werner, 2003; Horowitz, 2004; Ingram, 2007; Waldorf, 2004). In his article in *Teaching Artist Journal*, Eric Booth (2003) defines a *teaching artist* as “a practicing professional artist with the complementary skills and sensibilities of an educator, who engages people in learning experiences in, through and about the arts” (p. 11). The term *teaching artist* was coined in the 1970s by June Dunbar to avoid using the term *resource professional* (Booth, 2003).

In arts-integrated settings, teaching artists work as partners with regular classroom teachers. These classroom teacher–teaching artist teams plan together and then integrate arts content with academic content in the classroom. Teaching artists also may work in schools in nonintegration models, in performance, as artists-in-residence, and as guest instructors (Burnaford, 2007).

Teaching artists have described the position of teaching artist as a practice and not a profession, although some teaching artists believe that it may grow into a position with professional status (Booth, 2003, p. 5). Though the practice of teaching artists is currently most often something without formally recognized certification, organizations around the country have begun a trend of offering arts-integration specific coursework and credentials. For instance, the new Arts Integration Specialist Program (AISP), offered through Alameda County, California, “provides K–12 teachers and teaching artists in public schools the insight, understanding, and skills” needed to provide effective arts and arts-integrated instruction. Requirements for coursework

needed within a three-year period are listed online (Alliance for Arts Learning Leadership, 2011, para. 1). The Wolf Trap Foundation offers a formal program of professional development (PD) for teaching artists and in its Arts in Education Model Development and Dissemination (AEMDD) grant provides the PD to teaching artists and classroom teachers (Wolf Trap Foundation, n.d.).

Teaching artists bring their own expertise into the classroom, where they also may encounter a less familiar focus on academic benchmarks and standards as they work with academic classroom teachers to improve student learning (Burnaford, 2007). The amount of support that teaching artists give to classroom teachers varies across schools and districts, ranging from cases where artists are the primary classroom teachers to cases where teaching artists provide assistance to classroom teachers to cases where classroom teachers and teaching artists work together as coteachers to integrate disciplines (Freeman et al., 2003; Horowitz, 2004). A recent study has reported that the day-to-day coaching that teaching artists offer to classroom teachers, compared with other forms of professional development (such as summer training), is a particularly effective way for classroom teachers to learn to integrate art into the classroom (Saraneiro & Goldberg, 2011). Also recently, Rabkin, Reynolds, Hedberg, and Shelby (2011) conducted a large-scale, three-year investigation of the “world and work” of teaching artists; their report synthesizes information from 3,550 surveys, 211 interviews, and site visits on both the East Coast and the West Coast of the United States.

Moving Into the 21st Century

Although research has pointed to a continued decline of the presence of art in schools in recent years (Rabkin & Hedberg, 2011), arts-integration models continue to be developed and improved (Scripp, 2007), and there are promising signs that arts-integration efforts may receive some federal attention in the future, particularly in support for research (National Endowment for the Arts, 2011; President’s Committee on the Arts and Humanities [PCAH], 2011). A renewed interest in the arts as an essential part of the K–12 curriculum, with the goal being the development of the whole child, comes at a time when there has been a national conversation about whether and to what extent the arts have been marginalized in or deleted from local school districts in the push to meet NCLB standards (PCAH, 2011; Rabkin & Hedberg, 2011). In a recent contribution to the literature, Rabkin and Hedberg (2011) examined trend data from the Survey of Public Participation in the Arts (SPPA) and found that the data suggest a decline in school-based arts education offerings, particularly since 2001–02 (Hedberg, 2011, pp. 14–15). Some researchers also contend that access to educational arts offerings is not equitable (PCAH, 2011; Seidel et al., 2009). It is common, according to their reports, to find that children in economically affluent communities have access to quality education in the arts, but children living in more impoverished areas rarely have such opportunities (PCAH, 2011; Seidel et al., 2009, p. 6).

Yet, there has been new recognition of the value of arts integration by federal lawmakers. In May 2011, PCAH issued a research report on reinvesting in arts education. The report includes a review of research on arts education outcomes, as well as evidence pointing to the “crisis” of America’s education system. It also includes a discussion of factors that contribute to a timely opportunity to step up the national effort to bring more arts into public schools. According to the report, factors that contribute to this opportunity include new allies interested in developing

students' creativity and problem-solving skills; increased interest in the potential of arts integration as a way to bring arts to more young people; a developing community of teaching artists; and a critical mass of successful arts approaches and models, which includes arts integration models (PCAH, 2011, p. 37).

PCAH recommended the following activities:

1. Building collaboration among different arts-education approaches, between federal and state agencies and arts educators
2. Developing the field of arts integration by strengthening teacher preparation and PD, targeting available arts funding, and setting up communities of practice to share ideas
3. Expanding in-school opportunities for teaching artists, who represent an underused and underdeveloped resource in increasing the quality of arts education
4. Using federal and state policies to reinforce the place of arts in K–12 education, and employing the arts to increase the rigor of curriculum, strengthen teacher quality, and improve low-performing schools
5. Widening the focus of the evidence on arts education (PCAH, 2011, pp. vii–viii, pp. 48–53); specifically, PCAH argues that there is a need for the following:
 - Credible evidence about the relationship between arts education and creativity
 - Methods of measuring students' creativity that can be used in local school districts
 - More solid information about the impact of arts education on increasing student engagement in school and persistence in learning
 - Tools for teachers and administrators to support improvement in arts programs and track related outcomes, including arts learning assessments (PCAH, 2011, p. 53)

The report notes that proficiency in arts competencies is difficult to measure and that test developers are designing “a new generation of assessment tools,”⁴ with support from the federal government (PCAH, 2011, p. 54). A recent report by WestEd (Herpin, Quinn, & Li, 2012), sponsored by the National Endowment for the Arts, reviews the state of assessment for the arts through conversations with expert consultants; a review⁵ of arts assessment literature; and a nationwide survey of policymakers, researchers, and practitioners. Echoing the PCAH report, it finds that there is a lack of publicly available research and technical reports and a lack of publicly available high-quality assessment tools, informational documents, and how-to resources related to K–12 student learning in the arts (Herpin, Quinn, & Li, 2012, p. iv).

Also recently, the U.S. Department of Education and the White House Domestic Policy Council have contributed to the creation of the President's Committee's Turnaround Arts Initiative, a “public-private partnership designed to help transform some of the nation's lowest performing

⁴ The report does not offer details on who these test developers are or what the “new generation of assessment tools” will include.

⁵ The literature review included a rating process to ensure that only relevant and high-quality materials were analyzed.

schools through comprehensive and integrated arts education,” which was developed from the recommendations from the PCAH report (PCAH, 2012).

In the current debates about federal budget cuts, the government has continued to allocate a relatively modest amount of funding to existing grants from AEMDD, the program that supports the Wolf Trap initiative. This program, offered through the Office of Innovation and Improvement, is intended to “further the development of models that effectively strengthen and integrate arts in elementary and middle school core academic curriculum” (U.S. Department of Education, 2011b). Since the inception of the program, 146 grants have been awarded, and 33 new AEMDD grants were awarded in 2010 (U.S. Department of Education, 2011a). The funding typically includes support for three school years of program implementation as well as evaluation.

The Wolf Trap Foundation for the Performing Arts is among a cohort of recipients, which includes the School District of the City of Pontiac in Michigan, the Philadelphia Arts in Education Partnership, the Tennessee Art Commission, and the Solomon R. Guggenheim Museum Foundation, among others (Randi Korn & Associates, Inc., 2005, 2007, 2010; U.S. Department of Education, 2011a).

AEMDD makes reports available that include summaries of individual grantees’ programs and evaluations (U.S. Department of Education, n.d). For instance, the Tucson (Arizona) Unified School District received a 2001 grant to collaborate with local arts organizations to implement a project called Opening Minds Through the Arts [OMA] (U.S. Department of Education, n.d.). OMA is a model of arts-infused programming that integrates art disciplines of music, dance, and drama into the curriculum. From 2001 to 2004, the program was implemented at three underperforming K–5 schools that serve a socioeconomically disadvantaged population. WestEd conducted a three-year study to assess the effectiveness of OMA and found that OMA enhanced teacher effectiveness, strengthened the arts as a core instructional area, and improved student achievement (U.S. Department of Education, n.d.).

Assessment of Arts Knowledge

In this paper, we are concerned with tools to assess the results of *arts-integration programs or approaches*, which seems to be a challenge for researchers and is considered a gap in the literature (Horowitz & Webb-Dempsey, 2002; PCAH, 2011). It seems there has been a greater amount of work done focusing on how to assess *arts knowledge*—that is, student knowledge *in* the arts, *about* arts content, and *in* art-specific skills. This subsection offers a brief background on assessment designed to measure *arts knowledge*.

Policymakers consider standards on learning in the arts and subsequent assessment of those standards to be the means to quality and accountability in arts education (Consortium of National Arts Education Associations, 1994, cited in Seidel et al., 2009). However, assessing student knowledge in arts-related content or skills has not historically been a priority for standardized testing in the United States. Many discussions of arts-knowledge assessment see arts education as not suited to standardized testing. The arts are seen as personalized and process oriented, and standards and assessment are seen as uniform and product oriented (Seidel et al., 2009). Assessment of arts knowledge also is not generally a priority of large-scale arts-integration programs, so arts knowledge was not a focus of the “student outcomes” portion of these programs. These evaluations instead focused on nonarts, academic outcomes (such as scores on

mathematics and verbal standardized tests), as well as outcomes such as creativity and critical thinking (Catterall & Waldorf, 1999; Ingram & Seashore, 2003).

The best known and most broad-based arts initiatives with implications for assessment in the United States are the National Arts Standards, the National Assessment of Educational Progress (NAEP) Arts Assessment, the International Baccalaureate (IB) Diploma Program, and the Advanced Placement (AP) arts program. The National Arts Standards were established in 1994 with the passing of the Goals 2000: Educate America Act. This law identified the arts as a part of required learning, and the National Arts Standards focus on cumulative, sequential learning in the arts. The National Arts Standards recommend that 15 percent of total instruction time in elementary and middle school be spent on the arts and that the arts be a requirement, rather than an elective, in high schools (Seidel et al., 2009). The National Arts Standards also are intended to serve as a foundation for assessment of student learning; they outline content areas, specifying what students should know and be able to do in each grade level in the arts. These standards are not binding for any American public schools although they have informed some state standards in the arts (Seidel et al., 2009).

The NAEP Arts Assessment was developed to test what American students know in the arts. It was first administered in 1997 to 6,480 students in 268 schools, at which time it was the first national assessment of arts education in 20 years (National Center for Education Statistics [NCES], 2011). The assessment includes paper-and-pencil tasks, as well as performance tasks, to determine students' abilities to create original art, perform or recreate existing art, and respond to the arts. In 2008, NCES administered the NAEP Arts Assessment to a nationally representative sample of 7,900 eighth graders from public and private schools in music and visual arts (NCES, 2011). NCES reported that it did not assess students in dance and theatre because of budget constraints and the small percentage of students with dance and theatre programs (NCES, 2011).

The NAEP Arts Assessment is currently the only nationally administrated arts assessment designed to present a representative picture about what U.S. students know in the arts. States with state-level arts assessment requirements include Delaware, Hawaii, Kentucky, New Hampshire, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, and Washington (Arts Education Partnership, 2012). States that do not have state-level arts assessment requirements but administer standardized tests in the arts in some manner include Arkansas, Colorado, Florida, Oregon, South Carolina, West Virginia, and Wisconsin (Arts Education Partnership, 2012). Recently, test designers have begun to develop state-level arts assessments that are aligned to content standards and approved for use for educator effectiveness evaluation (Colorado Department of Education, n.d.).

The IB program and The College Board's AP program are two large-scale programs that include rigorous courses and assessment in the arts for individual high school students that elect to take part (Seidel et al., 2009). The IB program includes courses in visual arts, film, theater, and music (International Baccalaureate Diploma Program, 2011). The AP program includes two courses in the visual arts and one in music (The College Board, 2012). External examiners conduct the assessment in the IB program, focusing on products such as portfolios created over time or research journals documenting artistic processes. AP assessments include a portfolio assessment for the Studio Art AP course, a paper-and-pencil assessment (that includes some listening

questions, as well as “sight singing”) for the AP Music Theory course, and a paper-and-pencil assessment that includes examination of images for the AP Art History course. Both programs strive for high interrater reliability among scorers (The College Board, 2012; International Baccalaureate Program, 2011; Seidel et al., 2009).

Assessment of arts knowledge also is not usually done in early childhood years (Wright, 1994). Our review indicated that many educators do not even consider assessing young children’s arts knowledge, and some educators may avoid it because of the costs, because they do not believe that the results are useful, or because the assessment does not seem compatible with the child-centered, process-oriented philosophy that is typical in early education (Wright, 1994). Still, other educators believe that assessment in the arts is important for young children (e.g., National Association for the Education of Young Children & National Association of Early Childhood Specialists in State Departments of Education, 2009; Wright, 1994).

Chapter 2: Literature Review Process

We focused our 2011–12 review of arts-integration literature on the following three key questions:

- What constructs (e.g., outcomes, features, characteristics) have other researchers measured when trying to capture the contributions of arts-integration efforts?
- What gaps in knowledge or tools persist?
- What are the implications for our own evaluation?

We conducted our search with the Wolf Trap evaluation in mind, anticipating that the results of our search would allow us to improve the specificity of constructs in our logic model and to refine the analysis approach for qualitative data collected by teaching artists.

To answer the three questions, we looked at a variety of types of materials: literature reviews, research compendiums, research syntheses, essay collections, books, program evaluations, impact studies, and metastudies, though we did not attempt to be exhaustive. This section summarizes our approach and points out some key resources we used to compile this review. A list of useful tools and resources can be found in Appendix B.

The reader should also note that we did not review this literature for methodological rigor to limit the number of papers we could include in the review. This is because our focus was not on the impacts of arts-integration—which would have necessitated such an assessment of how well suited studies’ designs were to evaluating outcomes—but rather on what constructs have been measured and what gaps remain.

Although major reviews (Herpin, Quinn, & Li, 2012; Horowitz & Webb-Dempsey, 2002; Winner & Cooper, 2000) suggest that the body of studies focusing on the impact of the arts on student learning indeed has a variety of limitations for measuring impacts (e.g., limited ability to quantify arts learning and/or quality arts programming, low-quality assessment tools, small study samples, a prevalence of correlational studies, and few randomized controlled trials)—and we echo these concerns about the arts-integration⁶ literature base—we feel there is value for our purposes in presenting the measures and measurement tools upon which some of these studies are based. In addition, where it enriches the discussion of what constructs to measure, we do describe the outcomes cited by these studies. However, in these cases, AIR is neither endorsing nor calling into question other researchers’ findings.

⁶ Horowitz and Webb-Dempsey (2002) and Herpin, Quinn, and Li (2012) review studies about the arts generally. The topic of this paper, arts integration, falls under this umbrella but has a narrower focus.

Types of Constructs

As we initially explored the literature, we saw that researchers have measured a variety of constructs when examining arts-integration efforts. We have grouped this literature into four categories of constructs:

- District-, school-, or program-level constructs
- Arts integration-focused professional development constructs
- Teacher practice constructs
- Student learning constructs

District-level constructs include districtwide factors, such as local artistic resources or district assessment policy; *school-level constructs* include whole-school factors, such as whole-school culture or safety; *program-level constructs* refer to program factors, such as program satisfaction or program staff coverage. District-, school-, and program-level constructs have been examined in evaluation studies that chart the success of several recent multischool programs, such as AAA, CAPE, A+, and LTA, which have improved public classroom environments and, in some cases, have helped to turn around schools.

PD features such as fidelity, content, teacher, and student goals of institutes and coaching also have been studied (Garet, Porter, Desimone, Birman, & Yoon, 2001). When the PD is focused on arts integration, the literature finds that, in general, creating teacher–artist teams enriches students’ classroom experiences (Burnaford, 2007).

Evaluations that examine how PD-supported *teacher practice* facilitates learning in arts-integrated curricula focus on components of good pedagogy as well as the collaborative relationship between teaching artists and classroom teachers (Catterall & Waldorf, 1999; Ingram & Seashore, 2003; Randi Korn & Associates, 2005, 2007, 2010).

We have grouped the studies of *student learning* outcomes into the following five categories of constructs to measure: changes in art content mastery; changes in academic, nonart, content mastery; improvements in attitudes or behavior; social emotional outcomes; and changes in “process” abilities, such as creativity or critical thinking (Horowitz & Webb-Dempsey, 2002; Rabkin & Redmond, 2004). Some studies focus on outcomes for specific subgroups of students, such as English language learners, underperforming students, economically disadvantaged students, or urban students.

The Focus of the Review: Teacher Practice and Student Learning Constructs

The literature on arts integration notes that more research is needed to understand how to measure student-level outcomes after arts integration efforts (Horowitz & Webb-Dempsey, 2002; PCAH, 2011). Research on student achievement demonstrates that teachers are an important influence on student outcomes (Goe & Stickler, 2008), and isolating the factors in teacher practice that make a difference for students continues to be a priority and a challenge for researchers. In our review of arts-integration literature, we focused on what constructs researchers have measured in two categories: *teacher practice* and *student learning*.

In our review, we did limit the scope, choosing not to undertake further study on the features of PD that lead to teacher knowledge and practice because these features have been well studied (Garet et al., 2001; Garet et al., 2008). We similarly did not focus on district-, school-, or program-level outcomes, which also are well studied (e.g., Rabkin & Redmond, 2004).

Process of Review

We began this review by looking at the most recent and comprehensive literature reviews, research compendiums, and research compilations relevant to arts integration. Burnaford's (2007) literature review, AEP's research compendium *Critical Links: Learning in the Arts and Student Academic and Social Development* (Deasy, 2002), and Fiske's (1999) compilation of research, *Champions of Change*, are key resources.

As background for examining arts integration, we also reviewed some resources on arts education more generally. Seidel and colleagues' (2009) *Qualities of Quality* report is a helpful resource for what good arts education (in general) should look like. The PCAH recent report, *Reinvesting in Arts Education*, puts arts integration in the context of current national priorities and offers a review focused around "ways to expand arts opportunities for underserved schools" (PCAH, 2011, p. 9). There also is a body of literature that looks at student outcomes after arts exposure (rather than arts integration), including Winner and Hetland's (2000) metastudy on how arts instruction affects nonarts cognition processes such as spatial temporal reasoning. The National Endowment for the Arts (2011) report is the most recent compilation of evidence-based studies and programs that have identified cognitive, social, and behavioral outcomes from arts interventions.

We then focused on the A+, AAA, CAPE, and LTA arts-integration programs, as well as the VTS curriculum (which has been used as part of many arts-integration programs). We chose these initiatives because they have been studied and evaluated frequently and because they include programming for elementary students. To get the big picture on these efforts, we looked at essays and syntheses that examine the evaluations and studies of one or more of these programs. Key materials include essays collected in *Putting Arts in the Picture: Reframing Education in the 21st Century* (Rabkin & Redmond, 2004), Horowitz (2002), and Horowitz and Webb-Dempsey in *Critical Links* (2002).

From there, we looked at recent program evaluations and research studies on each of these individual programs in order to identify constructs that other researchers have measured, as well as tools for measurement. The key research materials we reviewed include the following:

- **A+:** Nelson's *Executive Summary of Seven Policy Reports* (2001), Baker and Seaman's (2002) review of the program evaluation summary in *Critical Links* (Deasy, 2002), and Thomas and Arnold's (2011) study
- **AAA:** Ingram and Seashore's (2003) evaluation, Ingram and Riedel's (2003) study, and Ingram and Meath's (2007) follow-up; Wahlstrom's (2003) study, Ingram's (2007) report on long-term artists' perspectives, and Freeman and colleagues' (2003) report

- **CAPE:** Catterall and Waldorf’s (1999) summary evaluation in *Champions of Change*, Scripp’s (2007) study of Developing Early Literacy Through the Arts (DELTA), Waldorf’s (2004) report on teaching artists, Burnaford’s (2006) report on trends in evidence, and *Critical Links*’ (2002) review of Catterall and Waldorf (1999)
- **LTA:** Randi Korn and Associates’ (2005) study of LTA, *Teaching Literacy Through the Arts (TLTA)*; Randi Korn and Associates’ (2007) executive summary of 2004–05 and 2005–06 *Teaching Literacy Through the Arts (TLTA)* studies; and Randi Korn and Associates’ (2010) study of LTA, *The Art of Problem Solving (APS)*
- **VTS:** *Project Zero* researchers Tishman, MacGillivray, and Palmer’s (1999) investigation⁷ of VTC⁸ implementation; Housen’s (2002) study of VTS implementation in Byron, Minnesota; Curva and Associates’ (2005b) evaluation report on the *Artful Citizenship Project*; and the VTS’s Summaries of Selected Research document (2011)

In addition to these five programs, we also looked at individual research studies (e.g., Catterall, 1998; Saraneiro & Goldberg, 2011), including studies that focus on early childhood (e.g., Erdoğan & Baran, 2009; Goodman, 1990). Treffinger, Young, Selby, and Shepardson’s (2002) *Assessing Creativity: A Guide for Educators* is a helpful guide and includes a thorough review of creativity definitions and assessments.

In Appendix B, we describe a number of assessments and other tools created to measure teacher or student characteristics or outcomes. This description includes six studies that have used locally developed assessments designed to measure process abilities (such as creativity) to examine the link between arts-integration instruction and students’ process abilities (Curva & Associates, 2005b; Housen, 2002; Randi Korn & Associates, 2005, 2007, 2010; Scripp, 2007; Tishman, MacGillivray, & Palmer, 1999).

⁷ The report notes that Project Zero staff believed that a full-scale evaluation would be premature and calls the endeavor an “investigation” (Tishman et al., 1999, p. 1).

⁸ The name of Visual Thinking Curriculum (VTC) changed and it is now referred to as the Visual Thinking Strategies (VTS) Curriculum.

Chapter 3: Identifying Constructs in the Literature— Teacher Practice

The Wolf Trap intervention combines a summer institute in teaching practices (e.g., instructional strategies, including intentional questions and formative assessment) with coaching for classroom teachers, conducted by teaching artists. The summer institute is designed according to the research-based principles of high-quality PD: duration, form, collective participation, focus on content, active learning, and coherence (Garet et al., 2001). The additional coaching and modeling by teaching artists is similar to what we know as *classroom coaching*, which has been well studied in educational literature (Garet et al., 2008; Taylor, 2007). There also is a substantial body of literature examining the role of the teaching artist, who functions in many ways as a coach (Booth, 2003; Ingram, 2007; Waldorf, 2004).

In this chapter, we review research that addresses what teachers learn from PD that focuses on arts-integration teaching strategies, seeking to identify the constructs that other researchers have measured. Tools that we found to be helpful for the measurement of these constructs are included in Appendix B.

The literature we reviewed indicates that constructs important to measure can be divided into the following two types:

1. Constructs that capture how teachers' or teaching artists' practice is affected by arts-integration PD and constructs that capture how their attitudes may be changed.⁹ These constructs include the following:
 - Changes in **pedagogy**, or strategies of instruction
 - The extent to which teachers' practice is **consistent with program goals and strategies**
 - Changes in teacher **perceptions** and **attitudes**
 - The **background** of classroom teachers and teaching artists, including the importance of an integration teacher's experience in the "other" discipline
2. Constructs that capture elements of classroom teachers' collaboration with teaching artists. These constructs include the following:
 - The depth and type of **support** offered to teachers by teaching artists
 - The quality of the **relationship** and collaboration between classroom teacher and teaching artist partner
 - The amount of **time** that classroom teachers and teaching artists have available during or outside the school day to plan and coordinate and the extent to which there is an **expectation** that this planning will take place

⁹ Note that a teacher's changed attitudes may then also change the teacher's practice.

- How teaching artists and other school staff view the **role of teaching artists** within the school

We begin our discussion with pedagogy. As background, we first offer a working definition of pedagogy, note principles of effective pedagogy in early childhood, and describe measurement of pedagogy in early childhood classrooms. We then present examples of what researchers have found about how arts-integration initiatives influence pedagogy.

Pedagogy

Many research and evaluation studies that measure the outcomes of arts integration consider changes in teacher *pedagogy*, or strategies of teaching. For a broad working definition of *pedagogy*, we refer to the *Five Standards for Effective Teaching: How to Succeed With All Learners, Grades K–8*, in which Dalton (2007) defines *pedagogy* as the “system of principles and methods that support and facilitate effective teaching,” and as a term that is implied in the use of the term *instruction* (p. 4). Components of pedagogy include teacher-student interaction, classroom organization, social arrangements of students, activity design, schedule, setting and context, and management, in addition to the delivery of the content itself (Dalton, 2007).

The literature that discusses instructional strategies that are key for teaching young children in particular builds on similar components, which underlie the design of prekindergarten and kindergarten programs and lessons (National Association for the Education of Young Children, 2009) and have been integral to the Wolf Trap intervention. *Eager to Learn: Educating Our Preschoolers* (2000) reviews this literature, synthesizing research that has implications for early childhood pedagogy and summarizing principles of effective pedagogy for young children (Bowman, Donovan, & Burns, 2000). These principles include the ideas that (1) cognitive, social-emotional, and physical development are mutually supportive areas requiring active attention in early childhood, and (2) responsive interpersonal relationships nurture children’s emerging abilities. With regard to curricula, the report explains that although no particular curriculum can be identified as “best,” the research suggests lessons that are applicable to a spectrum of different pedagogical approaches. These lessons include the following:

- Children who have a broad base of experience in **domain-specific knowledge** (e.g., in mathematics or an area of science) move more rapidly in acquiring more complex skills.
- More **extensive language development**—such as a rich vocabulary and listening comprehension—is related to early literacy learning.
- Children are better prepared for school when early childhood programs expose them to a **variety of classroom structures, thought processes, and discourse patterns** (i.e., children experience different kinds of discourse patterns; mental strategies such as categorizing, memorizing, reasoning, and metacognition; and a mix of whole-class, small-group, and one-on-one teacher-student interactions).
- Teaching and learning will be most effective if they **engage and build on children’s existing understandings**.
- Key concepts involved in each domain of preschool learning (e.g., representational systems in early literacy, the concept of quantity in mathematics, causation in the

physical world) must go hand-in-hand with **information and skill acquisition** (e.g., identifying numbers and letters and acquiring information about the natural world).

- Metacognitive skill development allows children to solve problems more effectively. Curricula that encourage children to **reflect, predict, question, and hypothesize** set children on the course of engaged, effective learning (Bowman et al., 2000, pp. 307–308).

Although not listed as a finding or implication in the Bowman et al. (2000) report, the role of play in the structure of learning environments, curriculum, and pedagogy for young learners has been well studied. Much research has focused on attributes of the playing process, such as social interaction, symbolic representation (literacy), role rehearsals, fantasy, enactments, and motor/perceptual coordination (Bowman et al., 2000, pp. 216–217).

Measuring Changes in Pedagogy

To measure changes in pedagogy (or changes in instructors' *strategies of teaching*), approaches typically include classroom observation, teacher reports (e.g., surveys, logs, and interviews), principal evaluations of teacher performance, student evaluations of teacher performance, analysis of classroom artifacts, examination of teacher-developed portfolios, and value-added models (Little, Goe, & Bell, 2009).

In evaluations and studies that focus on early childhood classrooms, one instrument that is being used more and more often to assess the quality of teacher-student interactions is the Classroom Assessment Scoring System, or CLASS (Pianta, La Paro, & Hamre, 2008). CLASS has been adopted as an assessment tool by every Head Start classroom in the United States (Kendziora, Weissberg, Ji, & Dusenbury, 2011) and has been used as a part of many studies (e.g., Mashburn et al., 2008). It is a rubric that includes three domains (emotional support, classroom management, and instructional support) and 10 dimensions (positive climate, negative climate, teacher sensitivity, regard for student perspectives, behavior management, productivity, instructional learning formats, concept development, quality of feedback, language modeling). These dimensions reflect extensive research on teacher-student interactions in the classroom (Pianta et al., 2008).

In the literature that aims to measure teacher outcomes after arts-integration efforts, researchers have used interviews, surveys, and classroom observations to collect data on teaching strategies. We include examples of tools used to collect data on teaching strategies in Appendix B. This literature suggests that arts-integration programs and related PD can have an effect on the use of teaching strategies by teachers and teaching artists (Catterall & Waldorf, 1999; Ingram & Seashore, 2003; Nelson, 2001; Randi Korn & Associates, 2005, 2010; Scripp, 2007). The literature is focused primarily on primary and secondary grades and not specifically on prekindergarten and kindergarten. (Although the early childhood literature is substantial in itself, there are few published evaluations or research studies focused on instructional strategies for arts integration in early childhood.) Following are the findings from the literature we reviewed, aligned with Dalton's (2007) categories.

Teacher-Student Interaction

- Ingram and Seashore (2003) reported that teachers became more **child-focused**. For instance, teachers became more comfortable acting as facilitators of student learning, rather than solely as knowledge dispensers, as a result of AAA. The arts integration enabled students to work at their own pace, explore concepts, and make personally meaningful connections (Ingram & Seashore, 2003).
- Randi Korn and Associates (2005) reported that teaching artists incorporated **active listening**.
- Wahlstrom (2003) reported that in AAA arts-integrated classrooms, teachers were observed to examine subject matter with students **as though teachers and students were equal partners in discussion and problem solving**. In these situations, “positive student self-esteem was visibly evident” when students were working as partners with teachers (Wahlstrom, 2003, p. ii).
- Randi Korn and Associates (2010) reported that teaching artists **referred to students as “artists.”**

Social Arrangements of Students

- Mason, Steedly, and Thormann (2008) reported that arts integration helps teachers **facilitate involvement** of special-needs students
- Reif and Grant (2010) reported that it helps **culturally diverse** students in their interactions with other students and in general.

Setting and Context

- Some AAA teachers used their **classroom space** differently during arts instruction, which led to using these alternative room arrangements during nonarts lessons as well (Wahlstrom, 2003).

Activity Design

- After arts lessons made frequent use of “**warm-up**” sessions, AAA teachers reported interest in having more “warm-up” for other lessons (Wahlstrom, 2003).
- Randi Korn and Associates (2005) reported that teaching artists incorporated art-making **demonstrations**.

Delivery of Content

- Nelson (2001) reported that teachers improved their ability to **integrate art and academic content to a high degree**.
- Wahlstrom (2003) reported that, compared with previous lessons, AAA lessons included **greater emphasis on idea formulation, planning, flow of thought, and completeness of product**.
- Wahlstrom (2003) also reported that PD helped teachers use an expanded toolkit of strategies, including greater use of **critique**, more frequent encouragement of **risk taking**, and greater use of **revision and improvement**.

- Teachers reported that LTA made them more **reflective** teachers (Randi Korn & Associates, 2010).
- Ingram and Seashore (2003) reported that teachers expanded their roles in efforts to **redefine their own curricula** and improve student learning.
- CAPE classroom teachers reported increases in their ability to teach **within arts disciplines** (Scripp, 2007).

Although the constructs were examined in primary and secondary classrooms, we believe that they also are useful constructs to measure in early childhood settings. These settings may include early childhood classrooms taking part in formal arts-integration programs, as well as early childhood classrooms generally. As mentioned earlier, it is common for early childhood classrooms to integrate the performing or visual arts into classroom lessons to some degree, outside the context of formal arts-integration initiatives such as AAA and A+ (Cross, Woods, & Schweingruber, 2009).

Teachers’ and Teaching Artists’ Practice: Consistency With Arts Integration Program Goals

Although *the extent to which teachers’ and teaching artists’ practices were consistent with program goals* could be considered part of “pedagogy,” we think of this construct as different, reflecting coherence or alignment with program goals. Research indicates that this construct is important, suggesting that program goals should be aligned with standards, emphasized in PD, consistent with teacher goals, and consistent with teacher practice in the classroom (Catterall & Waldorf, 1999; Garet et al., 2001; Ingram & Meath, 2007; Ingram & Seashore, 2003; Nelson, 2001; Rabkin & Redmond, 2004; Randi Korn & Associates, 2005, 2010; Scripp, 2007). Examples are the following.

Learning Through Art (LTA)

The LTA evaluations identify LTA program strategies and examine the extent to which they are implemented (Randi Korn & Associates, 2005, 2010). For instance, in 2005, observers looked at whether teaching artists exhibited program inquiry strategies, including asking open-ended questions (such as those that elicit multiple answers), encouraging students to be thorough, soliciting multiple responses using wait-time and follow-up questions, asking students to back up interpretation with evidence from artwork, and asking students focused questions on a chosen theme (Randi Korn & Associates, 2005, p. 134). In 2010, observers looked at whether teaching artists employed four specific teaching strategies believed to cultivate students’ problem-solving abilities: acknowledging multiple approaches and individual solutions; questioning assumptions and following one’s curiosity; thinking intentionally and making deliberate choices; and seeing mistakes, problems, and challenges as solutions (p. 56). Further, evaluators looked at four ways in which teaching artists may convey these strategies: (1) recognizing, (2) challenging, (3) modeling, and (4) showing examples (Randi Korn & Associates, 2010, p. 56, and in Appendix B of the report).

Chicago Arts Partnerships in Education (CAPE)

The DELTA study of CAPE schools identified and defined six key criteria for building “teaching for transfer strategies” into arts-integrated lessons, including big ideas, parallel literacy process, multiple symbol systems, multiple representations, multiple intelligences, and multiple cognitive processes (Scripp, 2007). These strategies were then used as part of a rubric that allows scorers to rate the extent to which a given lesson includes “teaching for transfer” (Scripp, 2007).

In the Imagine Project’s 1998–99 evaluation of CAPE, observers investigated the extent to which creative thinking, decision making, and “seeing things in one’s mind’s eye” were promoted in lessons, according to Catterall and Waldorf’s summary evaluation (1999).

A+ Schools Program

A+ teachers reported an increase in their use of all the A+ programs’ key instructional strategies during a four-year period, including lessons that tapped multiple intelligences and interdisciplinary thematic units, hands-on instruction, interdisciplinary instruction, and integration of arts activities with core academic content (Nelson, 2001).

Changes in Teacher Perceptions and Attitudes

Emerging from the literature, another construct measured is teachers’ perceptions and attitudes, which have changed after PD and during the course of an arts-integration initiative. For instance, arts integration in some cases is reported to have changed teachers’ perception of their students’ capacities (Ingram & Seashore, 2003; Wahlstrom, 2003). Wahlstrom (2003) noted:

Teachers were continually amazed at what they discovered or learned about the children in their classrooms, particularly as high-energy kids positively channeled that energy into a physical demonstration of what they were learning. Teachers began to develop a larger view of the capacity for leadership among their pupils. For instance, we saw a third grader who popped out of his seat literally about every 30 seconds, giving his input and tending to everybody else’s business around him but his own. In the arts-infused lesson, where continuity of a story line and the use of props were the tasks of the day, he was put “in charge” of the script and the readying of props for each scene. He was brilliant in keeping the story in mind, and in gently reminding his peers of when they entered and what they needed as a prop.... Afterward, the teacher said, “Today I have seen [child’s name] in a whole new light.” (Wahlstrom, 2003, p. 8, as cited in Ingram & Seashore, 2003, pp. 7–8)

Researchers have also found that teachers’ attitudes about teaching changed during the course of arts integration. For instance, when researchers compared teachers’ survey responses before and after the CAPE intervention, they reported that teachers in CAPE’s DELTA program became increasingly willing to take risks and try new approaches to teaching (Scripp, 2007, p. 110). An earlier CAPE program evaluation indicated the importance of this characteristic, suggesting that it takes “adventuresome” and “risk-taking” teachers to have a quality arts-integration program because integration involves changes in the way teachers are used to teaching and may take teachers out of their comfort zones (Catterall & Waldorf, 1999).

The Background of Teachers and Teaching Artists

As in education research generally, arts-integration research and evaluations often examine the background of teachers and teaching artists in terms of *years of experience* and *level of education attained* for clues about variation in implementation and outcomes. In the context of integrating arts and academic disciplines, it is also worth noting the relative importance of a teachers' background in the area he or she is less familiar with (i.e., art for classroom teachers, pedagogy or curriculum for teaching artists).

Although prior arts experience can be helpful in such settings, researchers have reported that prior experience in an art form is relatively unimportant for classroom teachers' success in arts integration (Horowitz, 2004; Ingram & Seashore, 2003; Nelson, 2001; Randi Korn & Associates, 2005; Scripp, 2007). For instance, CAPE teachers reported that factors more likely than "prior art experience" to predict success in arts integration teaching included "degree of interest," "enthusiasm" and "flexible incorporation of arts into teaching academic subjects" (Scripp, 2007).

With respect to teaching artists, some researchers report that it is helpful if teaching artists are informed about the developmental growth of children, noting that having such experience would boost the teaching artist's likelihood of success (Catterall & Waldorf, 1999).

The Role of Teaching Artists

Another construct measured in the literature is the role of the new teaching artists within a school (Booth, 2003; Ingram, 2007; Rabkin & Redmond, 2004; Scripp, 2007; Waldorf, 2004). In some schools, experienced teaching artists have worked across disciplines as staff leaders and managers (Rabkin & Redmond, 2007). In others, teaching artists have assisted informally, by facilitating participation of teachers and encouraging teachers to be motivated (Ingram, 2007). In other schools, teaching artists were vulnerable to a feeling of isolation in schools until they got to know teachers well (Scripp, 2007). In some schools, artists also worked with school arts specialists, although this situation was less common. In these cases, the in-school arts specialists were often interested in their projects, but some had no time to engage in them. Some artists occasionally found the art specialists "aloof and distant, as though challenged by the presence of the professional artist" (Waldorf, 2004). In general, the artists Waldorf (2004) talked to who had had contact with arts specialists believed that when teaching artists and arts specialists worked together, both parties gained from the interaction.

The Depth and Type of Support Offered to Teachers by Teaching Artists

The literature suggests that the depth and type of support offered to teachers by teaching artists is a key characteristic that distinguishes between different types of integration programs. Freeman et al. (2003) offer a useful framework of five different "implementation models" of arts integration programs in which the teaching artist is an essential component.

1. The **residency model** "involves the school or teacher bringing in one or more artists for a period of time to engage students in the resident artist's program. The purpose is usually to give students a wider range of arts experiences than the school staff can provide. The experiences do not directly support the curricular goals of other nonarts disciplines."

2. The **elaborated residency model** “is fundamentally an arts experience, but this residency is intentionally tied to developing nonarts skills identified by the teachers. The artist is the primary teacher, and it is his or her program, but the teacher is available to assist with carrying out the experience.”
3. The **capacity-building model** “prepares teachers to use an art form in their own teaching. The artist’s role is to instruct teachers, and the teacher participates with the intention of learning the process and products of the art form. Teachers may work alone, directly with the artists, or with colleagues to identify ways to infuse the art form’s skills and concepts with nonarts disciplines.”
4. The **coteaching model** “involves teacher–artist pairs integrating concepts from the arts and nonarts disciplines that reinforce each other. At different points, students’ experiences may focus more on the art form or on the nonarts subject, although at other times the arts and nonarts instruction appear seamless. The teacher and artist create lessons that guide the artist during sessions that focus on the arts and clarify what the teacher will do when the artist is not present.”
5. The **concepts across the curriculum model** involves “three or more people who select a unit of study in which the disciplines have common concepts. Though teachers and artists plan together, each discipline instructs students separately, using the common concepts. The projects that fit this model involved arts and nonarts teachers employed in the school selecting an art form that would further reinforce the concepts in the unit of study” (p. ii).

Implementation of arts-integrated programming varies across this spectrum of teaching artist involvement (Freeman et al., 2003). For instance, Freeman et al. (2003) consider the experience of North City K–8 to fall into the capacity-building model. At North City, a single visual artist offered three lessons to each classroom teacher and also gave two whole-staff workshops (Freeman et al., 2003).

The Quality of the Relationship and Collaboration Between Classroom Teacher and Teaching Artist Partner

The literature indicates that a key construct to measure is the quality of the collaborative relationship established between the teacher and teaching artists: nearly all of the evaluations we reviewed emphasized the importance of this relationship, which is reported to influence teachers’ classroom instruction (Catterall & Waldorf, 1999; Ingram & Seashore, 2003; Randi Korn & Associates, 2005, 2007, 2010; Scripp, 2007).

The relationship between a teaching artist and a classroom teacher is different from the relationships that classroom teachers may have with other classroom teachers (Rabkin & Redmond, 2004). Teaching artists and classroom teachers may have different backgrounds, and both parties could be integrating a relatively unfamiliar discipline into their everyday work with students (Catterall & Waldorf, 1999). Teaching artists are also usually guests to the school and are seen differently from teachers who work at the school more permanently (Scripp, 2007).

In addition, prior to the intervention, teachers may or may not have spent much time coordinating with one another. In many schools, collaboration, curriculum development, and

interdisciplinary work are not standard practices (Rabkin & Redmond, 2004). In these cases, teacher may be thought of as “solo acts,” with some periodic check-in with teachers and administration. To make the collaborative partner relationship successful, teachers and teaching artists may need to work to bridge a “culture gap” that exists, due to the widely differing backgrounds of the partners (Rabkin & Redmond, 2004).

Nearly all of the evaluations we reviewed gathered data about the quality of the collaborative relationship or the support that artists offer teachers (Catterall & Waldorf, 1999; Horowitz, 2004; Ingram, 2007; Ingram & Seashore, 2003; Randi Korn & Associates, 2005, 2007, 2010; Scripp, 2007; Waldorf, 2004). For instance, to measure teacher collaboration, Randi Korn and Associates used the TLTA literacy rubric to address how effective the collaboration was between the classroom teacher and the teaching artist during the artist’s lessons (Randi Korn & Associates, 2005). The DELTA Final Artist–Classroom Teacher Interview protocol probed for examples of the support received, as well as for examples of support needed but not always present (Scripp, 2007, Appendix E).

The evaluations found that artists and teachers had different views of the strengths and challenges of the relationship. Some artists described exceptional and dynamic partnerships with teachers (Ingram, 2007). For instance, Ingram (2007) quotes one veteran artist’s description of a particularly successful partnership:

In however many—20 years, I’ve done this, I think it was probably the first time that that’s ever worked that way. And that’s a credit to [teacher], who does have a dance background. It’s very comfortable and she’s interested in doing more and more of it. So this was really definitely a partnership. And it might be the best art education partnership I’ve ever been a part of. (p. 3)

Other teaching artists described their relationship with classroom teachers as one of the greatest challenges of their work (Randi Korn & Associates, 2010). Some felt isolated at first (Scripp, 2007), and others believed that they could be more effective with better support from administrators and better relationships with teachers (Horowitz, 2004). Still other teaching artists described gaining tremendous respect for the work of classroom teachers, although also noticing that teachers were typically overburdened with work (Waldorf, 2004). These teaching artists generally believed that if teachers showed little active effort in arts’ efforts or seemed unwilling to get deeply involved with planning the units, it was because they were already overwhelmed with other instructional duties (Waldorf, 2004).

Most classroom teachers generally enjoyed and appreciated having the support of artists in the classroom (Randi Korn & Associates, 2005), and many noted “extensive buy-in” (Catterall & Waldorf, 1999). However, teachers need to prepare to relinquish control of the classroom at times, which is not easy for all teachers. Researchers agree that it is helpful for teachers (and teaching artists) to be “open-minded,” “flexible,” and “willing to take risks” in their work in this new partnership situation (Catterall & Waldorf, 1999; Scripp, 2007). Researchers also agree that partnerships are most successful when teacher and teaching artists have mutual respect for the subject of the other, and when partners are willing to be students of one another (Catterall & Waldorf, 1999; Horowitz, 2004).

Time for Coaching, Planning, and Coordinating

Another key construct measured is the *time* that is available for classroom teachers and teaching artists to plan, coordinate, and support one another. Researchers agree that the sustained, day-to-day teacher–teaching artist partner coaching is integral to the PD component of arts-integration programs. Studies report that the duration and intensity of teacher coaching matters, and that teacher learning increases when there are greater levels of coaching from artists (Ingram, 2007; Ingram & Meath, 2007; Ingram & Seashore, 2003; Saraneiro & Goldberg, 2011). A variety of studies also report that it is important for time to be built into teachers’ schedules to plan and coordinate, which may require making changes to already full schedules (Horowitz, 2004; Nelson, 2001; Scripp, 2007). For instance, A + program evaluators report that during the course of implementing A+, scheduling changes gave teachers the opportunity to work together (Nelson, 2001). A lack of planning time can hinder the work of the teacher–teaching artist partners, and respondents in several studies noted a lack of “sufficient time to plan” as a challenge (Horowitz, 2004; Nelson, 2001). As one AAA teacher put it, “planning time is big” (Ingram, 2007). Another teacher noted the importance of funding because AAA was able to pay for both artists and teachers to do this planning. The artist said the number one thing the artist liked about the AAA model was as follows:

The paid amount of planning time with a teacher. There’s no other organization that I know of that allows six hours of planning time paid to the teacher, and that’s gold because they have no time. They’re under unbelievable pressure and stress. So when you can say, “Yeah, it’s six hours of planning time, but that’s a paid thing” that’s huge. (Ingram, 2007, p. 9)

It also is important that administration and staff are on the same page about the planning needed for arts integration. In addition to time to coordinate, it is also critical that there be the *expectation* that this coordination take place (Ingram, 2007). In the absence of this expectation, for instance, one AAA teaching artist described frustration when not all teachers were present for a planning meeting (Ingram, 2007, p. 6).

The findings about the relative importance of coaching are supported by a recent experimental study conducted by Saraneiro and Goldberg (2011). The researchers compared the effectiveness of arts-integration teachers who received different treatments of PD. Some teachers participated in a summer institute and received coaching, some participated in a summer institute but received no coaching, and a control group received no PD. Saraneiro and Goldberg reported significant disparities in the progress made by the coached teachers and by the institute-only teachers. The coached teachers made greater gains in confidence than the institute-only teachers during the year of the study. Institute-only teachers self-reported that they were able to make progress toward changing their practice but that the progress was small in comparison to the coached teachers.

Tools for Measuring Teacher Practice Outcomes

As a part of the studies we reviewed, researchers used tools to collect data about teachers and teaching artists; these tools included interview protocols, surveys and questionnaires, and

observation forms. In Appendix B, we briefly describe several of these tools, as examples. These tools include the following:

1. CLASS (2008)—a research-based observation instrument used extensively today to assess classroom quality in preschool through 12th-grade classrooms. It focuses on teacher–student interactions in three domains: emotional support, classroom management, and instructional supports (Pianta et al., 2008).
2. Randi Korn and Associates’ Classroom Observation Form (2005)—a form developed for use in a study of the TLTA arts-integration program. It aims to capture the extent to which teachers exhibit 18 behaviors important to the TLTA arts-integration program, as well as several whole-class behaviors.
3. Randi Korn and Associates’ (2010) Teacher Observation Constructs—includes 12 behaviors (e.g., teachers refer to students as artists, teachers provide feedback to individual students as needed). As a part of the 2010 study, researchers observed whether teaching artists did or did not employ all 12 behaviors.
4. The DELTA Artists–Classroom Teacher Interview Protocol (2007)—includes a segment in which interviewees are asked to speak about the impact of the DELTA arts-integration program on their own personal teaching practices (Scripp, 2007).

In line with these instruments, AIR has developed a form (Wolf Trap Observation Form, forthcoming) to document the extent to which teachers integrate arts and mathematics content in their lessons. This tool, together with others developed by AEMDD grantees, is likely to be made available to the grantees through the program website after the data collection has been completed.

Chapter 4: Identifying Constructs in the Literature—Student Learning

As part of the Wolf Trap evaluation, AIR will be examining student outcomes, during the implementation of the intervention and at the end of the project, by looking at student results on the Early Math Diagnostic Assessment (EMDA).

There is a substantial body of literature that has examined how student learning may change as a result of or in association with the changes in pedagogy, organization, or curriculum implemented through arts-integration interventions. We have grouped these student-learning changes into the following five main categories to measure:

- Changes in **art-content mastery**
- Changes in **academic, nonart content** mastery
- Changes in **attitudes or behavior**
- Changes in **social emotional learning** and **attitude/behavior**
- Changes in **process abilities**, such as creativity or critical thinking

Next, we turn to what researchers who have either measured these constructs or indicated their importance have found. As explained in Chapter 2, we describe study outcomes to enrich the discussion about what constructs to measure and what gaps remain in the field; readers are reminded that AIR is neither endorsing nor calling into question other researchers' findings.

Tools that are helpful for measurement of student outcomes can be found in Appendix B.

Changes in Art-Content Mastery

Assessment in arts knowledge—or student knowledge *in* the arts, *about* arts content, and *in* art-specific skills—is not commonly conducted in early childhood years, and this testing has not generally been a priority of large-scale arts integration programs (Wright, 1994). In addition, we found that measuring arts knowledge was not a part of the “student outcomes” portion of evaluations of any of the large-scale arts-integration programs we chose to focus on in this paper. These evaluations instead focused on nonarts academic outcomes, such as scores on mathematics and verbal standardized tests, as well as process outcomes such as creativity and critical thinking.

Yet, there have been arts-integration programs that have assessed students in their arts knowledge, and Horowitz (2004) summarizes the findings of some of these assessments (p. 25). For instance, Transforming Education Through the Arts Challenge (TETAC) evaluators developed a visual arts assessment, based loosely on the NAEP arts assessment. Researchers reported that third- to fifth-grade students learned visual arts skills at a faster rate in those schools that had most successfully implemented the Comprehensive Arts Education (CAE) model (Horowitz, 2004). Arts Basic for Children (ABC) evaluators field-tested assessments in music and visual arts, and results provided “some indication” that the ABC arts-immersed curriculum supports higher achievement in the arts

(Horowitz, 2004, p. 25). There is also literature that looks at assessment of young children in the arts in general, outside of arts integration (Wright, 1994).

Changes in Academic, Nonart Content Mastery

Researchers have investigated the link between large-scale arts-integration programs and mathematics and English language arts (ELA) standardized test scores (Catterall & Waldorf, 1999; Ingram & Meath, 2007; Ingram & Reidel, 2003; Thomas & Arnold, 2001). There also have been smaller studies that have examined the link between learning outcomes and arts integration in early childhood classrooms specifically, including those reviewed in Deasy's *Critical Links* compendium (e.g., Catterall & Wilson, 2002a, 2002b; Erdoğan & Baran, 2009). However, researchers agree that the ability of standardized reading and mathematics tests to capture all learning outcomes from arts-integrated education is limited (Rabkin & Redmond, 2004; Scripp, 2007). The tests are not *designed* to measure process abilities such as critical thinking and creativity, which are addressed by arts integration.

Nevertheless, many researchers agree that there is value in exploring the relationship of arts-integrated treatment and academic test scores. For example, Ingram and Reidel (2003) reported finding a positive and significant link between AAA arts-integrated programming during the school day and standardized test scores. Similarly, Catterall and Waldorf (1999) report that children in CAPE arts-integrated elementary schools perform better on tests than those in comparison schools (Catterall & Waldorf, 1999; Deasy, 2002). Thomas and Arnold (2011) examined the link between data on the North Carolina end-of-grade tests in reading comprehension and in mathematics, and report that the data analysis demonstrated no statistically significant difference in the academic performance of students attending A+ schools. The authors note that survey results suggest that the largest potential impact of A+ schools may be in their influence on student interest in school and creative expression.

The impact of arts integration may not be the same for all learners. Some researchers have reported the impact of arts to be significant for students with the greatest need, and sometimes more significant for those students, as compared with the general student population (Catterall, 1998; Ingram & Riedel, 2003). Ingram and Reidel (2003) report that in some cases, the relationship between arts integrated programming and student achievement was strongest for students of low socioeconomic status (those in the free or reduced-price lunch program) and/or English language learners.

Smaller scale studies also have tested the link between arts-integrated programming and student learning outcomes, in early childhood classrooms specifically. Burnaford's 2007 literature review includes summaries of discrete small-scale studies of arts-integration programming, and the AEP's *Critical Links* compendium reviews such studies. Each of these reports sorts studies by art area, including dance, drama, music, visual arts, and multiarts. For example, studies that have examined early education in drama in particular have reported links to academic literacy skills such as word-writing fluency and story-telling abilities (Goodman, 1990; Pellegrini, 1984). As another example, Erdoğan and Baran (2009) reported a link between drama-infused math instruction for 6-year-olds in Turkey and achievement scores on the Test of Early Mathematics Ability mathematics test.

Changes in Social Emotional Learning and Attitude/Behavior

Social emotional learning is a complex term that includes both attitudes and behaviors. Some of these attitudes and behaviors have been the focus of study in arts-integration settings. The Collaborative for Academic, Social, and Emotional Learning (CASEL, 2007) defines *social emotional learning* (SEL) as a process for developing fundamental skills for life effectiveness, including skills needed to handle oneself, one's relationships, and one's work, effectively and ethically. CASEL (2011) divides social emotional learning into five core competencies: self-awareness (recognizing one's emotions and values as well as one's strengths and limitations); self-management (managing emotions and behaviors to achieve one's goals); social awareness (showing understanding and empathy for others); relationship skills; and responsible decision making.

There is a developing literature that addresses the measurement of social emotional outcomes in early childhood in particular. Methods include behavior rating scales, student self-reports, third-party observational measures, and performance-based assessments (Kendziora et al., 2011). Researchers already have developed several compendia of early childhood measurement tools, including social emotional learning assessments. Kendziora, Ji, and Denham (2010) compiled a list of these compendia, which is included in Appendix B. In addition, Kendziora et al. (2010) developed a “consumer reports” for social emotional learning assessments, including teacher rating scales and student self-reports.

In this subsection, we present what researchers have measured from the literature, where arts integration is associated with social emotional outcomes for students. In our review of the arts-integration literature, we found that researchers also measured some other student attitudes—students' feelings about school, students' feelings about art, and students' general motivation—which seem to go beyond the SEL set of attitudes and behaviors. We include these indications here as well.

Research has found that in early childhood, making art generally builds children's self-esteem by giving them opportunities to creatively express what they are thinking and feeling (Sautter, 1994). The literature on arts-integrated programming also has suggested that changes in students' self-awareness can occur after arts-integration programming in elementary and high schools (Azzam, Grodzicki, Richards, & Szanyi, 2009; Catterall & Waldorf, 1999; Curva & Associates, 2005; Dallas Arts Partners, 2004; Horowitz, 2004).

For instance, some CAPE schools reported that the general quality of their assemblies increased with the implementation of the program because children were more confident and comfortable with performing, public speaking, and taking risks (Catterall & Waldorf, 1999). Horowitz (2004) similarly reported, in his own research as an evaluator for the New York City arts-integration partnership program site, that students gained self-confidence as they found they could achieve or perform new and challenging tasks. Dallas Arts Partners (2004) observed “focus” students during class and reported that students “frequently see themselves as agents” (i.e., as having a sense of personal agency) in the Arts Partners arts-integration context; during the observations, students described themselves as “wanting to,” “choosing,” “deciding,” and “mindful” in talking about their ideas (Dallas Arts Partners, 2004, p. 10).

Azzam et al. (2009) and Curva and Associates (2005) administered surveys as part of evaluations to measure students' social emotional change. Azzam et al. (2009) administered an arts confidence survey and reported that students in the Math in a Basket program appeared to have more confidence in their abilities to create and appreciate art when compared with control students. The authors noted that the difference was slight but statistically significant (Azzam et al., 2009). Curva and Associates (2005) developed a psychosocial survey to include in their analysis of the VTS-infused Artful Citizenship program, intended to measure art self-concept, art enjoyment, academic self-concept, and school and civic responsibility. Although the survey's psychosocial scales were found to be "not trustworthy" (p. 3), the endeavor represents an interesting attempt to capture students' social emotional change in a way that is quantitative and potentially useful for other programs (details of this survey are included in Appendix B).

Catterall (1998) also has reported linking involvement in the arts in general (not specifically as part of arts integration) to greater student self-confidence, measured by high school students' reports in a national survey.

The literature also notes changes in students' social behavior and self-management after arts-integration interventions (Azzam et al., 2009; Dallas Arts Partners, 2004; Ingram & Seashore, 2003; Nelson, 2001). For instance, Ingram and Seashore (2003) reported that major areas of change after the AAA intervention included the following:

- Improved communication in groups
- The emergence of unlikely leaders
- Blending of special needs children into their peer group
- Improved student teamwork to accomplish a goal

As another example, Dallas Arts Partners (2004) report that observation data indicate that students engage more frequently in collaborative learning behaviors (e.g., student questions the teacher, questions his or her peers, asks for help, observes another's work or activity) during Dallas Arts Partners arts-integration lessons, compared with typical lessons. Similarly, Curva and Associates (2005) reported that the Artful Citizenship Project's VTS-infused curriculum promoted good citizenship skills, cooperation, and respect and tolerance for the views of others. Azzam et al. (2009) reported that teachers in treatment schools rated their students' prosocial skills and ability to control their emotions higher than teachers in the control schools.

In a 2001 case study of AAA implementation in a high school, Freeman and Louis (cited in Ingram & Seashore, 2003) reported that arts-integrated instruction could improve how students relate to each other and reduce the social and academic isolation that some students feel.

Researchers also have reported that arts-integrated interventions improve behavior and attendance (Nelson, 2001). For instance, in the case of A+, the principal specifically credited the program for attendance gains.

Changes in Other Student Attitudes/Behaviors

Researchers have measured changes in students' motivation, as well as changes in students' feelings toward school and art. Studies generally report that teachers see students' motivation and enthusiasm increase because of arts integration (Azzam et al., 2009; Catterall & Waldorf, 1999; Curva & Associates, 2005; Horowitz, 2004; Nelson, 2001). Randi Korn and Associates (2010) reported that student attitudes about school became less positive as the year progressed, and that attitudes about art remained about the same; additionally, control and treatment students' ideas about the qualities of a good artist improved during the year, and control and treatment students reported more favorable art-work practices at posttest rather than pretest. Evaluators of Math in a Basket, an arts-integration initiative in California, used the Children's Academic Intrinsic Motivation Inventory (CAIMI)¹⁰ to measure treatment students' intrinsic motivation in mathematics, reading, science, and social studies, and their general intrinsic motivation, compared to control students (Azzam et al., 2009). They reported that students in the Math in a Basket program were more intrinsically motivated in math, reading, and science than were control school students; however, control school students and treatment students did not differ on their motivation for social studies or on their overall academic motivation (Azzam et al., 2009, p. 15).

Changes in Process Abilities, Such as Creativity or Critical Thinking

A major focus of the literature on arts integration is how initiatives may affect changes in student process abilities, such as creativity or creative thinking (Seidel et al., 2009). For our purposes, "process ability" broadly refers to any learning ability that can be improved, and it does not refer to the accumulation of content knowledge or a student's innate level of intelligence. There is a separate literature on how process abilities such as creativity and intelligence develop in young children in particular (for more information, see Runco, 2006).

There are a number of ways that researchers have categorized and defined process abilities, including them as aspects of "creativity" or "intelligence," and there is a large literature devoted to defining both of these terms. In *Assessing Creativity: A Guide for Educators*, Treffinger et al. (2002) review literature about creativity and divide the concept of creativity into the following four categories of process abilities:

1. **Generating ideas**, including divergent thinking, metaphorical thinking, elaboration, and flexibility
2. **Demonstrating the openness and courage to explore ideas**, including curiosity, self-confidence, fantasy and imagination, intuition, and adaptability
3. **Listening to one's "inner voice,"** including awareness of self, awareness of creativeness, persistence, self-direction, concentration, energy, and work ethic
4. **Digging deeper into ideas**, including critical thinking, analyzing, evaluating, seeing relationships, and preferring complexity (p. viii-ix).

¹⁰ The CAIMI is an instrument published by Psychological Assessment Resources.

Process abilities also fall into the categories of “intelligences.” Famously, Howard Gardner (1983) defined a theory of seven¹¹ intelligences. They are linguistic, logical-mathematical, musical, spatial, bodily kinesthetic, interpersonal, and intrapersonal (Brualdi, 1996).

The extent to which arts integration initiatives include teaching process abilities as a component of their program—together with the way in which they define these process abilities—may influence how teachers instruct, what students learn, and how evaluators measure results. For instance, the LTA program defined *problem solving*¹² as well as six characteristics¹³ of problem solving, including *imagining, experimentation, flexibility, resource recognition, connection of ends and aims, and self-reflection* (Randi Korn & Associates, 2010). Then, Randi Korn and Associates (2010) examined the extent to which teachers used relevant strategies, as well as the extent to which students exhibited problem-solving abilities in a Design-A-Chair activity.

There are several arts-integration programs, including A+ and AAA, which cite Gardner’s theory of intelligences as a framework for their work.

Interestingly, VTS cofounder Abigail Housen has sorted process abilities that students exhibit when viewing art into developmental stages,¹⁴ building on Michael Parsons’s work in this area (Parsons, 1989). These range from *accountive*, where viewers are “list-makers and storytellers” who offer “simple and concrete observations” to *re-creative*, where experienced viewers “willingly suspend disbelief” and see art objects as having a life of their own (Housen, 2007).

¹¹ Gardner then added an eighth intelligence, naturalist intelligence (Brualdi, 1996).

¹² Randi Korn and Associates’ (2010) definition of *problem solving* falls into our broad conception of “process ability.” Randi Korn and Associates (2010) explain that although *problem solving* may be “simply defined” as “the analysis and transformation of information towards a goal,” as in Lovett (2002), “a review of literature quickly reveals that no standard set of behaviors is associated with problem solving” (p. xii). The report explains that, instead, many skills and behaviors are associated with problem solving, such as exploration, analysis, and synthesis.

¹³ Randi Korn and Associates (2010) include definitions of each of the six characteristics:

(1) *Imagining*: Students place themselves within the task to the extent that he/she can envision the problem beyond the assignment given, including opportunities and constraints; (2) *Experimentation*: Students try a number of materials and/or tools as they create their art projects; (3) *Flexibility*: Students approach accidents, difficulties, and frustration with focus, patience, and further exploration; (4) *Resource Recognition*: Students pay attention to the resources provided and seek out resources appropriate for the task; (5) *Connection of Ends and Aims*: Students describe intentional and deliberate decisions and choices they made in creating art; (6) *Self-Reflection*: Students express explicit and thoughtful opinions or critiques of their art project and/or identify problems/difficulties (p. xii).

¹⁴ Housen describes these stages in *Art Viewing and Aesthetic Development: Designing for the Viewer* (Housen, 2007). According to Housen, in **Stage 1, Accountive**, viewers are list-makers and storytellers who make simple and concrete observations (e.g., “Lines, ovals, squares...” [Picasso, *Girl Before a Mirror*]). In **Stage 2, Constructive**, students look at art using the most “accessible tools at hand”—their perceptions, their knowledge of the natural world, and the values of their social and moral world (“They have five fingers, just like us.” [Picasso, *Girl Before a Mirror*]). In **Stage III, Classifying**, learners adopt the “analytical and critical stance of the art historian,” looking to identify the work as belonging to a place, school, style time, and provenance. In **Stage IV, Interpretive**, viewers seek an interactive and spontaneous encounter with a work of art (“I don’t think that [drawing the human form] was what he [the artist] really had in mind as being important...” [Matisse, *Dance*]). In **Stage V, Re-Creative**, viewers, having a long history of viewing and reflecting about works of art, now “willingly suspend disbelief.” The viewer sees the object as “semblant, real, and animated with a life of its own.” (“The more I look at the painting, the more I have this sense of the sexuality as being a kind of pressure that pushes away from the canvas but in some ways is tightly held by the canvas itself” [Picasso, *Les Demoiselles d’Avignon*]) (2007, pp. 2–8).

In classrooms, teachers and classroom observers have reported improvements in students' process abilities after arts-integrated programming (Catterall & Waldorf, 1999; Curva & Associates, 2005; Randi Korn & Associates, 2005; Waldorf, 2001). For instance, observers of TLTA classroom teachers' inquiry lessons reported that students demonstrated hypothesizing, extended focus, evidential reasoning, and building schema at a "moderate to high" degree, whereas their demonstrations of multiple interpretation and thorough description varied (Randi Korn & Associates, 2005). Observers of CAPE classrooms noted the degree to which creative thinking skills were promoted on a scale of "none" to "high." They found a "medium" degree in a nonintegrated lesson observation, and a "medium to high" degree in an integrated lesson observation (Catterall & Waldorf, 1999). Teaching artists noted improvements in the creativity of the students they worked with and described being aware of their roles in bringing out student individuality (Waldorf, 2001). *Artful Citizenship* teachers and administrators told evaluators that students' critical thinking skills, fostered in the integrated art and social studies curricula, "filtered" to other areas of the curriculum (Curva & Associates, 2005).

Teacher interviews and observation represent one way to measure process abilities. How to measure these abilities more precisely continues to be a challenge for researchers. The literature on assessing creativity describes four types of assessment instruments: performance assessments (in which test takers perform a behavior like writing or drawing), tests¹⁵ (in which a person responds to a structured set of tasks or questions, administered in standardized conditions), rating scales (which describe characteristics associated with creativity), and self-report measures (in which test takers respond to questions about themselves).

There have been some interesting and creative studies in which researchers have designed or used *performance assessments* that test process abilities to examine how arts-integrated programming might impact students' process abilities, such as creativity or critical thinking (Curva & Associates, 2005; Housen, 2002; Randi Korn & Associates, 2005, 2010; Scripp, 2007; Tishman et al., 1999). Tishman et al. (1999), Randi Korn and Associates (2005, 2010), Housen (2002), and Curva and Associates (2005) reported significant differences in student process outcomes between treatment and control groups after administering the performance assessments, and Scripp (2007) reported significant differences in student process abilities between pre- and posttests. Such outcomes include, for example, evidential reasoning, flexibility, hypothesizing, multiple interpretations, "aesthetic stage,"¹⁶ and visual literacy (Curva & Associates, 2005; Housen, 2002; Randi Korn & Associates, 2005, 2010; Tishman et al., 1999). We describe these six studies and the performance assessment instruments that go with them in more detail in Appendix B. The performance assessment instruments include the following:

1. The Snapshots of Early Arts Learning (SEAL) Assessment (2007) includes a performance section, in which students are observed while creating something, as well as

¹⁵ The Torrance test of creativity, for instance, is widely used (Kim, 2006).

¹⁶ An "aesthetic stage" refers to a level in Abigail Housen's "stages of Aesthetic Development." In her doctoral dissertation, Housen (1983) sorted process abilities that students exhibit when viewing art into developmental stages. (For more detail, see Appendix B-7.) Her 2002 study examines the relationship between exposure to the VTS arts-integrated curricula and students' aesthetic growth.

a reflective section, in which students are interviewed about their own art, other students' art, and art in general (Scripp, 2007).

2. The Student Performance Assessment (1999) is a written activity that asks students to look at both art and nonart images and then respond in writing to Visual Thinking Curriculum questions, **What's going on in this picture?** and **What do you see that makes you say that?** (Tishman et al., 1999).
3. Aesthetic Development Interview (ADI) and Material Object Interview (MOI) (2002) are "stream-of-consciousness" interviews developed by Abigail Housen and used in the VTS context. The ADI asks students to discuss an art object, and the MOI asks students to discuss a nonart object. In Housen's (2002) study, researchers then compared the content of these interviews to determine the extent to which students exhibit certain thinking behaviors when talking about art and the extent to which students transfer these behaviors to a nonart context. Responses were coded for "critical thinking counts" (ADI and MOI) and "Aesthetic Stage" (ADI only; Housen, 2002).
4. The Visual Literacy Assessment Survey (2005) is an assessment that asks students to view two images (reproductions of paintings) and respond in writing to VTS questions: (1) **What is going on in this picture? What do you see that makes you say that?** and (2) **What more can you find?** As part of Curva and Associates' (2005) evaluation, written responses were coded according to how well students exhibited four process abilities: *animation*, *analysis*, *interpretation*, and *description* (Curva & Associates, 2005, Appendix H).
5. TLTA Student Interviews: The Gorky painting and the Kadohata text (2005) consist of interviews that include three parts: (1) questions about a piece of students' own artwork, (2) questions about Arshile Gorky's painting *The Artists and his Mother*, and (3) questions about a piece of text from Cynthia Kadohata's novel *Kira-Kira*. The responses are then scored according to how well they exhibited four process abilities: hypothesizing, evidential reasoning, building schema, and multiple interpretations (Randi Korn & Associates, 2005).
6. LTA Design-a-Chair Student Interviews and Observations (2010) consist of (1) an activity in which students are asked to design a chair in 15 minutes, using at least three different materials, during which time they are observed by trained data collectors, and (2) interviews about the process afterwards. The students' work and responses are then scored according to how well they exhibited six process abilities: flexibility, imagining, resource recognition, experimentation, connection of ends and aims, and self-reflection (Randi Korn & Associates, 2010).

Chapter 5: Findings, Implications, and Recommendations

In this chapter, we present findings, implications and initial recommendations from our review. In brief, our recommendations include the following:

1. Program designers, evaluators, and researchers should consider the broad spectrum of constructs that can be measured when making decisions about designing, evaluating, or studying an arts-integration initiative.
2. Researchers should develop common definitions for each of the constructs in this spectrum, basing these definitions on theory and empirical work in the field.
3. A comprehensive and scientific review of the literature (studies and evaluations of arts integration) should be launched. Such a review will make it possible to determine the extent to which there is cumulative evidence of a link between arts integration and student outcomes.
4. Researchers should develop tools or instruments that are *not specific* to a particular arts-integration program, to assess changes in student outcomes after arts-integrated instruction—including changes in process abilities and changes in social emotional learning and attitude/behavior.
5. Researchers should develop a *non-program-specific* framework or rubric that would (1) pinpoint measurable aspects of quality arts-integrated instruction and (2) offer an overall measurement of the quality of a given interval of a teacher’s arts-integrated instruction.

Recommendation 1

Program designers, evaluators, and researchers should consider the broad spectrum of constructs that can be measured when making decisions about designing, evaluating, or studying an arts-integration initiative.

This paper identifies constructs from literature, based on five key arts-integration initiatives, as well as other studies. Emerging from this review is a spectrum of constructs that can be measured when examining an arts-integration program.

This spectrum includes (1) *teacher practice constructs*: changes in pedagogy, changes in attitudes, fidelity to program, teacher background; (2) *teacher–artist collaboration constructs*: depth and type of support offered to teachers by teaching artists, quality of relationship, time for planning, expectation of planning, role of teaching artist, and; (3) *student learning constructs*: changes in art content mastery, academic mastery, social emotional learning and attitude/behavior and in “process” abilities. Some studies focus on outcomes for specific subgroups of students, such English language learners, underperforming students, economically disadvantaged students, or urban students. There also are (4) *district-, school-, and program-level constructs* and (5) *PD constructs*.¹⁷

We believe that this spectrum of constructs can serve as a guide for program designers, evaluators, and researchers as they develop a program theory of action and logic model for research and evaluations. For instance, the literature (e.g., Horowitz & Web-Dempsey, 2002; PCAH, 2010) agrees that the field needs evidence about the extent to which arts-integration programs support different types of student outcomes. Program designers should consider the full spectrum of student outcomes supported by arts integration—academic outcomes, art-content outcomes, attitudes/behavior outcomes, social emotional outcomes, process ability outcomes—when making decisions about (1) how to design arts integration initiatives, (2) how to demonstrate the value of a given arts-integration initiative to the field, and (3) what constructs should be measured.

Recommendation 2

Researchers should develop common definitions for each of the constructs in this spectrum, basing these definitions on theory as well as empirical work in the field.

There are a wealth of studies that focus on the link between arts integration and student (or teacher) outcomes. Our review found that researchers have defined constructs in a variety of ways. Consider, for instance, changes in student process abilities. As part of Housen’s (2002) study, researchers administered two assessments focused on students’ process abilities—the ADI

¹⁷ For a brief description of *district, school, program, and PD constructs*, please refer to Chapter 2, Literature Review Process.

and the AOI (details in Appendix B). Analysis of written assessment responses included coding the responses according to “critical thinking scores,” defined as the sum of the counts of students’ “supported observations” and “speculations”¹⁸ (Housen, 2002; details in Appendix B). Randi Korn and Associates (2010) administered a different type of assessment, also focused on students’ process abilities. The report notes the importance of “higher order thinking skills like critical thinking and problem solving” (p. xi) and then focuses on “problem solving” for the purposes of the study. Researchers define *problem solving*, as well as six characteristics of problem solving: *imagining, experimentation, flexibility, resource recognition, connection of ends and aims, and self-reflection* (Randi Korn & Associates, 2010). Researchers then use these definitions to score an assessment of student process abilities, called Design-a-Chair (details in Appendix B).

The lack of common definitions of constructs poses a challenge to researchers aiming to group multiple studies together and make inferences about the group as a collective source of evidence. It points to a need for common, precise definitions of constructs so that each study can be compared with others, as pieces of a larger understanding of arts integration.

We would like to remind readers, though, that while we recommend the development of common definitions, there is valuable nuance and particularity in arts integration programs,¹⁹ which cannot always be captured by “common” definitions. A set of common definitions should not be considered a replacement for seeking more holistic understandings of individual arts programs when appropriate. Rather, it should be considered a tool for enriching a shared conversation about arts integration programs across the nation.

Recommendation 3

A comprehensive and scientific review of the literature (studies and evaluations of arts integration) should be launched. Such a review will make it possible to determine the extent to which there is cumulative evidence of a link between arts integration and student outcomes.

AIR reviewed key resources on arts integration, as explained in the Process of Review section. We found that the resources that review groups of studies and evaluations in arts integration in particular may have a set of standard criteria to assess the elements of a study or evaluation, but these resources have not examined the statistical evidence that may be reported in the research or evaluation. There are well-known processes for reviewing research; for instance, the What Works Clearinghouse offers a model (Institute of Education Sciences, 2011). A scientific, methodological review of literature is needed to validate the available studies that focus on arts integration, such as those included in this report.

¹⁸ Housen (2002) defines *supported observations* as “thoughts that entail an assertion that is grounded in evidence” and *speculations* as “thoughts about a possible meaning or outcome based on evidence” (p. 106).

¹⁹ K. Sheridan (personal communication, July 2012).

Recommendation 4

Researchers should develop tools or instruments that are *not specific* to a particular arts-integration program, to assess changes in student outcomes after arts-integrated instruction—including changes in process abilities and changes in social emotional learning and attitude/behavior.

The literature suggests some consensus on this point: that there is a need for ways to assess the results of arts-integrated instruction. Consider, for example, changes in student process abilities. This paper discusses six instruments that were designed to assess changes in students' process abilities after arts-integrated programming (details in Appendix B). The extent to which other researchers have used and have adapted these assessments has not been investigated as part of this paper. We did not see in the literature a guide that explains how one could adapt such program-specific assessments so that they could be useful across programs, but we could imagine a set of principles that would support adaptations.

It is our understanding that the six instruments that target process abilities are all performance assessments intended to be used after a particular arts-integration program. For instance, the LTA Design-a-Chair assessment is intended to be administered to students who had participated in the LTA program, and the Visual/Critical Literacy Assessment is intended to be administered to students who participated in the VTS curriculum.

Appendix B includes several known *standardized tests* that target creativity (a process ability) and were reviewed by Treffinger et al. (2002): *TCAM: Thinking Creatively in Action and Movement (70)* for young children only, *TTCT: Torrance Tests of Creative Thinking (72)* for Grades 4 to adult, and the *SEA test (12)* for upper elementary students. The Torrance test of creativity is the most widely used and has been administered around the country to identify gifted children (Kim, 2006). There is no research that we are aware of, however, about how these creativity test instruments might be able to be used to examine the effectiveness of arts-integration programs.

If there were an assessment focused on process abilities that could be used across different arts integration programs—whether performance assessment or standardized test—it could be useful (1) for programs, needing a way to measure outcomes, that have not developed their own, program-specific instruments and (2) as a way to compare how different types of programs target different types of process outcomes. Researchers should build on the existing base of work and develop tools that are not program-specific—that is, tools that can be used to measure student process outcomes after different types of arts-integration programs.

We found in our review of evaluations of arts-integration programs that there have not been any common instruments, used across studies, to measure changes in students' *social emotional learning* and *attitudes/behavior*. The literature seems to concur that changes in students' attitudes and behaviors and social emotional changes for students are important outcomes to study (Horowitz & Webb-Dempsey, 2002; PCAH, 2011). Further research is needed to survey the existing base of instruments that are available and determine the suitability of these instruments for use in the context of arts integration.

Recommendation 5

Researchers should develop a *non-program-specific* framework or rubric that would (1) pinpoint measurable aspects of quality arts-integrated instruction and (2) offer an overall measurement of the quality of a given interval of a teacher’s arts-integrated instruction.

The CLASS instrument is now used extensively as a tool to identify quality instruction and has been shown to be an observational tool that captures teacher behaviors linked to student gains (Pianta et al., 2008). Training based on CLASS has been shown to improve teacher practices, which research has shown are linked to student success in literacy (Hamre et al., 2012).

Researchers should conduct such a process to create a tool to identify quality arts-integrated instruction. Eventually, such a tool could be used to validate the results of arts-integration initiatives. Developing a tool would also be useful in that it could connect research on measuring quality in early childhood classrooms generally to the research on measuring quality in early childhood arts integration classrooms.

References

- Alliance for Arts Learning Leadership. (2011). *Art is education. Programs and practice: Integrated learning specialist program* [Website]. Retrieved from <http://www.artiseducation.org/what-we-do/our-programs/integrated-learning-specialist-program>
- Arts Education Partnership. (2012). *State of the states: Arts education policy summary 2012*. Washington, DC: Author. Retrieved from <http://wp.aep-arts.org/wp-content/uploads/2011/12/State-of-the-states-2012-FINAL.pdf>
- Azzam, T., Grodzicki, D., Richards, B., & Szanyi, M. (2009). *Math in a basket II: Evaluation report* (Year 2 of program implementation). Unpublished manuscript. Claremont Graduate University.
- Baker, T., & Seaman, M. (2002). Review of *The arts and education reform: Lessons from a four-year evaluation of the A+ Schools Program*, by C. A. Nelson. In R. J. Deasy (Ed.), *Critical links: Learning in the arts and student academic and social development* (pp. 84–85). Washington, DC: Arts Education Partnership.
- Beane, J. A. (1997). *Curriculum integration: Designing the core of democratic education*. New York: Teachers College Press.
- Bodilly, S., Augustine, C., & Zakaras, L. (2008). *Revitalizing arts education through community-wide coordination*. Santa Monica, CA: RAND Corporation.
- Booth, E. (2003). Seeking definition: What is a teaching artist? *Teaching Artist Journal*, 1(1), 5–12.
- Bowman, B. T., Donovan, M. S., & Burns, M. S. (2000). *Eager to learn: Educating our preschoolers*. Washington, DC: National Academy Press.
- Brualdi, A. C. (1996). Multiple intelligences: Gardner's theory. *Eric Digest*. Washington, DC: ERIC Clearinghouse on Assessment and Evaluation. (ERIC Document Reproduction Service No. ED410226F) Retrieved from <http://www.eric.ed.gov/PDFS/ED410226.pdf>
- Burnaford, G. (2006). *Moving toward a culture of evidence: Documentation and action research inside CAPE veteran partnerships. Veteran partnerships report 2005–2006*. Chicago: Chicago Arts Partnerships in Education. Retrieved from <http://www.capeweb.org/wp-content/uploads/2011/05/moving.pdf>
- Burnaford, G. (with Brown, S., Doherty, J., & McLaughlin, H. J.). (2007). *Arts integration frameworks, research and practice: A literature review*. Washington, DC: Arts Education Partnership. Retrieved from <http://choice.dadeschools.net/rrm/resources/BurnafordArtsIntegrationFrameworksResearchPracticeALitReview.pdf>

- Catterall, J. S. (1998). Involvement in the arts and success in secondary school. In J. Cossentino & D. Shafer (Eds.), *Americans for the Arts Monographs, 1(9)*. Washington, DC: Americans for the Arts.
- Catterall, J. S. (2002). The arts and the transfer of learning. In R. J. Deasy (Ed.), *Critical links: Learning in the arts and study academic and social development* (pp. 151–157). Washington, DC: Arts Education Partnership.
- Catterall, J. S. (2005). Conversation and silence: Transfer of learning through the arts. *Journal for Learning through the Arts, 1(1)*, 1–12.
- Catterall, J., & Waldorf, L. (1999). Chicago Arts Partnerships in Education: Summary evaluation. In E. B. Fiske (Ed.), *Champions of change: The impact of the arts on learning* (pp. 47–62). Washington, DC: Arts Education Partnership. Retrieved from <http://artsedge.kennedy-center.org/champions/pdfs/ChampsReport.pdf>
- Catterall, J., & Wilson, B. (2002a). Review of a naturalistic study of the relationship between literacy development and dramatic play in five-year-old children (Unpublished doctoral dissertation), by J. R. Goodman. In R. J. Deasy (Ed.), *Critical links: Learning in the arts and student academic and social development* (pp. 26–27). Washington, DC: Arts Education Partnership.
- Catterall, J. & Wilson, B. (2002b). Review of the effect of dramatic play on children’s generation of cohesive text, by A. Pellegrini. In R. J. Deasy (Ed.), *Critical links: Learning in the arts and student academic and social development* (pp. 44–45). Washington, DC: Arts Education Partnership.
- Chicago Arts Partnerships in Education (CAPE). (2011). [Website] Retrieved from <http://www.capeweb.org/>
- Collaborative for Academic, Social, and Emotional Learning. (2007). *Background on social and emotional learning (SEL)*. Chicago: Author. Retrieved from <http://casel.org/wp-content/uploads/2011/04/SELCASELbackground.pdf>
- Collaborative for Academic, Social and Emotional Learning. (2011). *What is social and emotional learning (SEL)?* [Website]. Retrieved from <http://casel.org/why-it-matters/what-is-sel/>
- The College Board. (2012). *Choose AP* [Website]. Retrieved from <http://www.collegeboard.com/student/testing/ap/about.html>
- Colorado Department of Education. (n.d.). Content collaboratives [Website]. Retrieved from <http://www.cde.state.co.us/ContentCollaboratives/index.asp>
- Consortium of National Arts Education Associates. (1994). *National standards for arts education: What every young American should know and be able to do in the arts*. Reston, VA: Music Educators National Conference.

- Cross, C., Woods, T., & Schweingruber, H. (Eds.). (2009). *Mathematics learning in early childhood: Paths toward excellence and equity*. Washington, DC: National Academies Press.
- Curva & Associates. (2005). *The Wolfsonian, Inc: Artful citizenship project, three-year project report*. Tallahassee, FL: Author. Retrieved from http://www.artfulcitizenship.org/pdf/full_report.pdf
- Dallas Arts Partners. (2004). *Arts and cultural learning: Changing achievement and expectations, three-year longitudinal study: Interim report—spring 2004*. Retrieved from http://www.dallasartspartners.org/%5Cportals%5C11%5CAP2ndYr_Assessment.pdf
- Dalton, S. (2007). *Five standards for effective teaching: How to succeed with all learners, Grades K–8*. San Francisco: Jossey-Bass.
- Deasy, R. J. (Ed.). (2002). *Critical links: Learning in the arts and student academic and social development*. Washington, DC: Arts Education Partnership. (ERIC Document Reproduction Service No. ED466413) Retrieved from <http://www.eric.ed.gov/PDFS/ED466413.pdf>
- DeSantis, K., & Housen, A. (2007). *Aesthetic development and creative and critical thinking skills study*. San Antonio, TX: Visual Understanding in Education. Retrieved from <http://www.vtshome.org/system/resources/0000/0004/SanAntonio-TX-VTS-Study.pdf>
- Efland, A. D. (1990). *A history of art education: Intellectual and social currents in teaching the visual arts*. New York: Teachers College Press.
- Erdoğan, S., & Baran, G. (2009). A study of the effect of mathematics teaching provided through drama on the mathematics ability of six-year-old children. *Eurasia Journal of Mathematics, Science & Technology Education* 5(1), 79–85. Retrieved from http://www.ejmste.com/v5n1/EURASIA_v5v1_SErdogan.pdf
- Fiske, E. B. (Ed.). (1999). *Champions of change: The impact of the arts on learning*. Washington, DC: Arts Education Partnership & President’s Committee on the Arts and the Humanities. (ERIC Document Reproduction Service No. ED435581) Retrieved from <http://www.eric.ed.gov/PDFS/ED435581.pdf>
- Freeman, C., Seashore, K. R., & Werner, L. (2003). *Arts for academic achievement: Models of implementing arts for academic achievement: Challenging contemporary classroom practice*. Prepared for Minneapolis Public Schools. Minneapolis: University of Minnesota, College of Education and Human Development, Center for Applied Research and Educational Improvement.
- Gardner, H. (1983). *Frames of mind*. New York: Basic Books.

- Garet, M. S., Cronen, S., Marian, E., Kurki, A., Ludwig, M., Jones, W., & Silverberg, M. (2008). *The impact of two professional development interventions on early reading instruction and achievement* (NCEE 2008–4030). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance.
- Garet, M. S., Ludwig, M., Yoon, K. S., Wayne, A., Birman, B., & Milanowski, A. (2010). *Making professional development more strategic: A conceptual model for district decisionmakers*. Washington, DC: American Institutes for Research. Retrieved from <http://education.alberta.ca/apps/cccorner/docs/Prov%20and%20Zone%20Education%20and%20PD%20Partner%20Info/General%20PD/Making%20PD%20More%20Strategic.pdf>
- Garet, M. S., Porter, A., Desimone, L., Birman, B., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, 38(4), 915–945.
- Goe, L., & Stickler, L. (2008). *Teacher quality and student achievement: Making the most of recent research* (TQ Research & Policy Brief). Washington, DC: National Comprehensive Center for Teacher Quality. Retrieved from <http://www.tqsource.org/publications/March2008Brief.pdf>
- Goodman, J. R., (1990). *A naturalistic study of the relationship between literacy development and dramatic play in five-year-old children*. Unpublished doctoral dissertation, Peabody College, Vanderbilt University.
- Guggenheim Museum. (2011a, April 20). *Learning through art at the Guggenheim Museum celebrates 40th year with annual exhibition of artwork by New York City public school students* [Press release]. New York: Solomon R. Guggenheim Museum. Retrieved from http://www.guggenheim.org/images/content/New_York/press_room/photo_service/LTA/ta_40_releaseapril22.pdf
- Guggenheim Museum. (2011b). *Learning through art* [Website]. Retrieved from <http://www.guggenheim.org/new-york/education/school-educator-programs/learning-through-art>
- Hamre, B. K., Pianta, R. C., Burchinal, M., Field, S., LoCasale-Crouch, J., Downer, J. T., Howes, C., LaParo, K., & Scott-Little, C. (2012). A course on effective teacher-child interactions: Effects on teacher beliefs, knowledge, and observed practice. *American Educational Research Journal*, 49(1), 88–123.
- Herpin, S., Quinn, A., & Li, J. (2012). *Improving the assessment of student learning in the arts*. Washington, DC: National Endowment for the Arts. Retrieved from <http://www.arts.gov/research/ArtsLearning/WestEd.pdf>
- Horowitz, R. (2004). *Summary of large-scale arts partnership evaluations* (pre-publication copy). Washington DC: Arts Education Partnership. Retrieved from <http://www.saveourstrings.net/LargeScaleArtsEvaluationReport.pdf>

- Horowitz, R., & Webb-Dempsey, J. (2002). *Promising signs of positive effects: Lessons from the multi-arts studies*. In R. J. Deasy (Ed.), *Critical links: Learning in the arts and student academic and social development* (pp. 98–100). Washington, DC: Arts Education Partnership.
- Housen, A. (2002). Aesthetic thought, critical thinking, and transfer. *Arts and Learning Research Journal*, 18 (1), 99–132. Retrieved from http://www.vtshome.org/system/resources/0000/0014/Aesthetic_thought.pdf
- Housen, A. (2007). Art viewing and aesthetic development: Designing for the viewer. In P. Villeneuve (Ed.), *Chapter 21: From periphery to center: Art museum education in the 21st century*. Reston, VA: National Art Education Association. Retrieved from <http://www.vtshome.org/system/resources/0000/0015/HousenArtViewing.pdf>
- Ingram, D. (2007). *Arts for academic achievement: Long-term artists' perspectives*. Minneapolis: University of Minnesota, Center for Applied Research and Educational Improvement. Retrieved from <http://www.cehd.umn.edu/carei/publications/documents/AAA-Artists-PerspectivesFinal-report.pdf>
- Ingram, D., & Meath, J. (2007). *Arts for academic achievement: A compilation of evaluation findings from 2004–2006. Executive summary*. Minneapolis: University of Minnesota, College of Education and Human Development, Center for Applied Research and Educational Improvement.
- Ingram, D., & Riedel, E. (2003). *What does arts integration do for students?* Prepared for the Minneapolis Public Schools. Minneapolis: University of Minnesota, Center for Applied Research and Educational Improvement.
- Ingram, D., & Seashore, K. R. (2003). *Arts for academic achievement: Summative evaluation report*. Prepared for Minneapolis Public Schools. Minneapolis: University of Minnesota, College of Education and Human Development, Center for Applied Research and Educational Improvement. Retrieved from <http://www.cehd.umn.edu/carei/publications/documents/Summative2003Rev.pdf>
- Institute of Education Sciences. (2011). *What works clearinghouse* [Website]. Retrieved from <http://ies.ed.gov/ncee/wwc/DocumentSum.aspx?sid=19>
- International Baccalaureate Diploma Program. (2011). *Diploma programme curriculum, Group 6: The arts* [Website]. Retrieved from <http://www.ibo.org/diploma/curriculum/group6/>
- James, D. W., Jurich, S., & Estes, S. (2001). Chicago Arts Partnership in Education. In *Raising minority academic achievement: A compendium of education programs and practices* (pp. 71–73). Washington, DC: American Youth Policy Forum. Retrieved from [http://educationinaminute.com/bogota/Education%20Reports/American%20Youth%20Policy%20Forum%20\(AYPF\)%20-%20Policy%20Report%20.pdf](http://educationinaminute.com/bogota/Education%20Reports/American%20Youth%20Policy%20Forum%20(AYPF)%20-%20Policy%20Report%20.pdf)

- Kendziora, K., Ji, P., & Denham, S. (2010). *Social and emotional learning assessment toolkit*. Chicago: Collaborative for Academic, Social, and Emotional Learning.
- Kendziora, K., Weissberg, R. P., Ji, P., & Dusenbury, L. A. (2011). *Strategies for social and emotional learning: Preschool and elementary grade student learning standards and assessment*. Newton, MA: National Center for Mental Health Promotion and Youth Violence Prevention, Education Development Center. Retrieved from http://www.promoteprevent.org/webfm_send/2306
- Kim, K. H. (2006). Can we trust creativity tests? A review of the Torrance Tests of Creative Thinking (TTCT). *Creativity Research Journal*, 18(1), 3–14. Retrieved from <http://kkim.wmwikis.net/file/view/Can+We+Trust+Creativity+Test.pdf>
- Kliebard, H. M. (2004). *The struggle for the American curriculum, 1893–1958* (3rd ed.). New York: Routledge Falmer.
- Little, O., Goe, L., & Bell, C. (2009). *A practical guide to evaluating teacher effectiveness*. Washington, DC: National Comprehensive Center for Teacher Quality. Retrieved from <http://www.tqsource.org/publications/practicalGuide.pdf>
- Mashburn, A., Pianta, R., Hamre, B., Downer, J., Barbarin, O., Bryant, D., Burchinal, M., & Early, D. (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development*, 79, 732–749.
- Mason, C. Y., Steedly, K. M., & Thormann, M. S. (2008). Impact of arts integration on voice, choice, and access. *Teacher Education and Special Education*, 31, 36–46.
- National Association for the Education of Young Children. (2009). *Developmentally appropriate practice in early childhood programs serving children from birth to age eight. Position statement*. Washington, DC: Author. Retrieved from <http://www.naeyc.org/files/naeyc/file/positions/position%20statement%20Web.pdf>
- National Association for the Education of Young Children & National Association of Early Childhood Specialists in State Departments of Education. (2009). *Where we stand on curriculum, assessment, and program evaluation* (Position statement). Washington, DC: Authors. Retrieved from <http://www.naeyc.org/files/naeyc/file/positions/StandCurrAss.pdf>
- National Center for Education Statistics. (2011). *National Assessment of Educational Progress (NAEP) arts assessment* [Website]. Retrieved from <http://nces.ed.gov/nationsreportcard/arts/>
- National Endowment for the Arts. (2011). *The arts and human development: Framing a national research agenda for the arts, lifelong learning, and individual well-being*. Washington, DC: Author. Retrieved from <http://www.nea.gov/research/taskforce/Arts-and-Human-Development.pdf>

- Nelson, C. A. (2001). *Executive summary: The arts and education reform: Lessons from a four-year evaluation of the A+ Schools Program, 1995–1999* (North Carolina A+ Schools Program Series). Winston-Salem, NC: Thomas S. Kenan Institute for the Arts.
- Noblit, G. W., Corbett, H. D., Wilson, B. L., & McKinney, M. B. (2009). *Creating and sustaining arts-based school reform: The A+ Schools Program*. New York and London: Routledge, Taylor & Francis Group.
- North Carolina Arts Council. (2013). *About A+: A brief history of the A+ Schools program* [Website]. Retrieved from <http://aplus-schools.ncdcr.gov/brief-history-of-the-a-schools-program>
- Parsons, M. (1989). *How we understand art: A cognitive developmental account of aesthetic experience*. Cambridge, MA: Cambridge University Press.
- Paul, R. (1990). *Critical thinking: What every person needs to survive in a rapidly changing world*. Rohnert Park, CA: Center for Critical Thinking and Moral Critique.
- Pellegrini, A. (1984). The effect of dramatic play on children's generation of cohesive text. *Discourse Processes, 7*, 57–67.
- Pianta, R., La Paro, K., & Hamre, B. (2008). *Classroom assessment scoring system™. Manual Pre-K*. Baltimore, MD: Brookes.
- President's Committee on the Arts and Humanities (PCAH). (2011). *Reinvesting in arts education: Winning America's future through creative schools*. Washington, DC: Author. Retrieved from http://www.pcah.gov/sites/default/files/PCAH_Reinvesting_4web_0.pdf
- President's Committee on the Arts and Humanities (PCAH). (2012). *Overview: Turnaround arts—creating success in school* [Website]. Retrieved from <http://turnaroundarts.pcah.gov/overview/>.
- Rabkin, N., & Hedberg E. C. (2011). *Arts education in America: What the declines mean for arts participation*. Washington, DC: National Endowment for the Arts. Retrieved from <http://www.nea.gov/research/2008-SPPA-ArtsLearning.pdf>
- Rabkin, N., & Redmond, R. (2004). *Putting the arts in the picture: Reframing education in the 21st century*. Chicago: Columbia College.
- Rabkin, N., Reynolds, M., Hedberg, E., & Shelby, J. (2011). *A report on the Teaching Artist Research Project: Teaching artists and the future of education*. Chicago: NORC at the University of Chicago. Retrieved from http://www.teachingartists.com/images/RabkinN_Teach_Artist_Research_2011.pdf.
- Randi Korn & Associates. (2005). *Solomon R. Guggenheim Museum: Teaching literacy through arts. Year One: 2004–2005 study*. Alexandria, VA: Museum Visitor Studies, Evaluation & Audience Research.

- Randi Korn & Associates. (2007). *Solomon R. Guggenheim Museum: Teaching literacy through art. Final Report: Synthesis of 2004–05 and 2005–06 studies*, Executive summary and discussion. Alexandria, VA: Museum Visitor Studies, Evaluation & Audience Research. Retrieved from http://www.guggenheim.org/images/Ita/pdfs/Executive_Summary_and_Discussion.pdf
- Randi Korn & Associates. (2010). *Educational research: The art of problem solving*. Prepared for the Solomon R. Guggenheim Museum. Alexandria, VA: Museum Visitor Studies, Evaluation & Audience Research. Retrieved from http://www.guggenheim.org/images/Ita/pdfs/APS_Executive_Summary.pdf
- Reif, N., & Grant, L. (2010). Culturally responsive classrooms through art integration. *Journal of Praxis in Multicultural Education*, 5(1), 100–115. Retrieved from <http://digitalcommons.library.unlv.edu/jpme/vol5/iss1/11>
- Runco, M. (2006). The development of children’s creativity. In B. Spodek & O. N. Saracho (Eds.), *Handbook of research on the education of young children* (2nd ed., pp. 121–131). Mahwah, NJ: Erlbaum.
- Ruppert, S., & Habel, S. (2011, July 19). *Integrating the arts across the curriculum*. Education Week Webinar, moderated by E. Robelen.
- Saraneiro, P., & Goldberg M. R. (2011). *The impact of professional development interventions on teacher learning in arts integration*. Presented at the 2011 conference of the American Educational Research Associates (AERA), New Orleans, LA. Retrieved from <http://dreaminstitute.files.wordpress.com/2011/06/aera-2011-saraniero-goldberg.pdf>
- Sautter, R. C. (1994). An arts education reform strategy. *Phi Delta Kappan*, 75(6), 432–437.
- Scripp, L. (with Burnaford, G., Bisset, A., Pereira, S., Frost, S., & Yu, G.). (2007). *From high expectations to grounded practice: The promise and challenges of modeling and disseminating CAPE arts integration-language literacy practices in Chicago Public School early elementary grades*. The Developing Early Literacies Through the Arts (DELTA) project final report. Chicago: Chicago Arts Partnerships in Education. Retrieved from http://www.capeweb.org/cape_research/ls_delta.pdf
- Seidel, S., Tishman, S., Winner E., Hetland L., & Palmer, P. (2009). *The qualities of quality: Understanding excellence in arts education*. Commissioned by the Wallace Foundation with support from the Arts Education Partnership. Cambridge, MA: Harvard Graduate School of Education, Project Zero. Retrieved from <http://www.wallacefoundation.org/knowledge-center/arts-education/arts-classroom-instruction/Documents/Understanding-Excellence-in-Arts-Education.pdf>
- Task Force on Children’s Learning and the Arts: Birth to Age Eight & Goldhawk, S. (1998). *Young children and the arts: Making creative connections. A report of the task force on Children’s Learning and the Arts: Birth to Age Eight*. Washington, DC: Arts Education Partnership.

- Taylor, J. (2007). Instructional coaching: The state of the art. In M. M. Mangin & S. R. Stoelinga (Eds.), *Effective teacher leadership: Using research to inform and reform* (pp. 10–35). New York: Teachers College Press.
- Thomas, R., & Arnold, A. (2011). The A+ schools: A new look at curriculum integration. *Visual Arts Research* 37(1), 96–104.
- Tishman, S, MacGillivray, D., & Palmer, P. (1999). *Investigating the educational impact and potential of the Museum of Modern Art's visual thinking curriculum. Final report*. Cambridge, MA: Harvard Graduate School of Education, Project Zero.
- Treffinger, D. J., Young, G. C., Selby, E. C., & Shepardson, C. (2002). *Assessing creativity: A guide for educators* (RM02170). Storrs: University of Connecticut, National Research Center on the Gifted and Talented.
- University of Minnesota. (2011). *Arts for academic achievement: Presentations and reports* [Website]. Retrieved from <http://www.cehd.umn.edu/carei/publications/aaa.html>
- U.S. Department of Education. (n.d.). *Performance results from a sample of AEMDD grantees of the 2001 through 2003 cohorts* [Website] Retrieved from <http://www2.ed.gov/programs/artsedmodel/performance.html>
- U.S. Department of Education. (2011a). *Arts in education—Model development and dissemination (AEMDD) grants program: Awards* [Website]. Retrieved from <http://www2.ed.gov/programs/artsedmodel/awards.html>
- U.S. Department of Education. (2011b). *Arts in education—Model development and dissemination (AEMDD) grants program: FAQs* [Website]. Retrieved from <http://www2.ed.gov/programs/artsedmodel/faqgeneral.html>
- Visual Thinking Strategies. (2011). *Summaries of selected VTS research*. Brooklyn, NY: Author. Retrieved from <http://www.vtshome.org/research/> (Download Research Summary)
- Visual Thinking Strategies. (2012a). *Major supporters* [Website]. Retrieved from <http://www.vtshome.org/about-us/major-supporters>
- Visual Thinking Strategies. (2012b). *Mission and vision* [Website]. Retrieved from <http://www.vtshome.org/about-us/mission-philosophy>
- Visual Thinking Strategies. (2012c). *History* [Website]. Retrieved from <http://www.vtshome.org/about-us/history>
- Visual Thinking Strategies. (2012d). *Program sites* [Website]. Retrieved from <http://www.vtshome.org/pages/program-sites>
- Visual Thinking Strategies. (2012e). *Research studies* [Website]. Retrieved from <http://www.vtshome.org/research/major-findings>

- Wahlstrom, K. L. (2003). *Arts for academic achievement: Images of arts infusion in elementary classrooms*. Prepared for Minneapolis Public Schools. Minneapolis: University of Minnesota, College of Education and Human Development, Center for Applied Research and Educational Improvement.
- Wakeford, M. (2004). A short look at a long past. In N. Rabkin & R. Redmond (Eds.), *Putting the arts in the picture: Reframing education in the 21st century* (pp. 81–106). Chicago: Columbia College.
- Waldorf, L. A. (2004). *The professional artist as public school educator. A research report of the Chicago Arts Partnerships in Education: 2000–2001*. Los Angeles: UCLA Graduate School of Education and Information Studies. Retrieved from <http://www.capeweb.org/wp-content/uploads/2011/05/artist.pdf>
- Winner, E., & Cooper, M. (2000). Mute those claims: No evidence (yet) for a causal link between arts study and academic achievement. *Journal of Aesthetic Education*, 34(3/4), 11–75. Retrieved from <http://www.jstor.org/stable/pdfplus/3333637.pdf?acceptTC=true>
- Winner, E., & Corbett, D. (2002). Review of *Chicago Arts Partnerships in Education (CAPE): Evaluation Summary*, by J. S. Catterall and L. Waldorf. In R. J. Deasy (Ed.), *Critical links: Learning in the arts and student academic and social development* (pp. 72–73). Washington, DC: Arts Education Partnership.
- Winner, E., & Hetland, L. (2000). *The arts and academic achievement: What the evidence shows*. In E. W. Eisner & M. D. Day (Eds.), *Handbook of research and policy in art education* (pp. 135–162). Hillsdale, NJ: Erlbaum. (Republished in the Taylor & Francis e-Library, 2008).
- Wolf Trap Foundation. (n.d.). *Institute professional development*. Retrieved from http://www.wolftrap.org/Education/Institute_Professional_Development.aspx
- Wright, S. K. (1994). Assessment in the arts: Is it appropriate in the early childhood years? *Studies in Art Education*, 36(1), 28–43. Retrieved from <http://www.jstor.org/stable/1320346>

**Appendix A:
Descriptions of Large-Scale
Arts-Integration Programs**

Appendix A: Descriptions of Large-Scale Arts-Integration Programs

The **Chicago Arts Partnership in Education (CAPE)** was founded in 1992. It is a privately funded organization that connects Chicago public schools and teachers with local art agencies and artists, with the guiding idea that arts education should be woven into the regular academic curriculum, not offered in isolation. The program has served schools that are high poverty, like the schools in Scripp’s 2007 study. At full implementation strength, CAPE involved 37 Chicago schools, 53 professional arts organizations, and 27 community organizations (James, Jurich, & Estes, 2001). Researchers have conducted studies and evaluations of the CAPE program (James et al., 2001). For instance, Caterall and Waldorf (1999) examined the relationship between CAPE program involvement and student outcomes like test scores, creative thinking, and social skills. CAPE continues to be active in arts integration and teaching artist work.

The **Arts for Academic Achievement (AAA) Program**, founded in 1997, supports a network of Minneapolis public schools in arts integration. The AAA program facilitates partnerships among schools, artists, and arts organizations, with the goal of integrating arts and nonarts disciplines to increase student achievement in both areas. AAA serves more than 17,000 students and works with more than 92 artists. Researchers have examined the relationship between AAA and positive academic results for students (Ingram & Reidel, 2003; University of Minnesota, 2011).

The A+ School Program (A+) is a “whole school reform model” in itself, with the vision of creating enhanced learning opportunities for students by using arts-integrated instruction. Established in 1995 by the Kenyan Institute for the Arts, the program began in North Carolina with 25 schools in the state (North Carolina Arts Council, 2013). Additional schools later joined the network, and after a four-year evaluation highlighted positive results, other states expressed interest in the program. In 2000, the North Carolina A+ Schools Program began a four-year process to assist the Kirkpatrick Foundation in Oklahoma City in establishing a statewide A+ Schools Program in Oklahoma. Today, the Oklahoma A+ Schools program has 68 schools, with plans to continue adding schools each year (North Carolina Arts Council, 2013). The A+ program is nationally recognized as a research-based strategy, and it is the subject of a book *Creating and Sustaining Arts-Based School Reform: The A+ Schools Program*, which explores how the incorporation of the arts into the identity of a school can be a key to its resilience in reform (Noblit et al., 2009).

Learning Through Art (LTA) is a program of the Solomon R. Guggenheim Museum, founded in 1970 by Natalie K. Lieberman in response to the elimination of art and music programs in New York City Public Schools (Guggenheim Museum, 2011a). It is an artist-residency program that aims to cultivate student creativity by designing sustained, process-oriented art projects that support learning across the curriculum. The program sends experienced teaching artists into New York City Public Schools, where they collaborate with classroom teachers to develop and facilitate art projects integrated into the school curriculum (Guggenheim Museum, 2011b). Since its inception, LTA has served more than 145,000 children and their families, primarily in New York City Public Schools (Guggenheim Museum, 2011a). Randi Korn and Associates (2005) conducted a study of LTA, called Teaching Literacy Through Art. Recently, Randi Korn and

Associates (2010) has published results from another study of LTA focused on problem solving. Both studies²⁰ were funded by AEMDD grants from the U.S. Department of Education.

The Visual Thinking Strategies (VTS) is a program developed by Philip Yenawine, a former director of the Museum of Modern Art (MoMA) and cognitive psychologist Abigail Housen. It has been implemented in more than a hundred schools around the country, as well as in museums internationally (VTS, 2012b, 2012d). VTS is “a student-centered curriculum in which students examine and discuss works of art, prompted by questions selected to support careful, evidentiary looking” (DeSantis & Housen, 2007). National and state-level supporters are listed on the program’s website (VTS, 2012a).

The three basic VTS questions are as follows: “What’s going on in this picture?” “What do you see that makes you say that?” and “What more can we find?” (DeSantis & Housen, 2007). *Visual Understanding in Education* (VUE), a nonprofit organization, was formed in 1995 by Yenawine and Housen, with the mission of testing and implementing VTS for students in the United States and abroad (VTS, 2012c). The VTS program has been repeatedly field-tested throughout its history by its own researchers, and multiple studies have produced complementary findings (VTS, 2012e). Independently, Harvard *Project Zero* researchers also conducted a study²¹ in 1999, at which time the program was referred to as the *Visual Thinking Curriculum* (VTC) (Tishman et al., 1999).

At three Miami Dade schools, the VTS curriculum has been used as a part of *Artful Citizenship*, a pilot educational program funded by an AEMDD grant. It is “an arts-integrated social studies curriculum project, designed to provide third- through fifth-grade students and teachers with the tools necessary to (1) develop visual literacy skills; (2) implement social science content across academic content areas; and (3) create opportunities for integrated artistic response” (Curva & Associates, 2005a). *Artful Citizenship* was developed by the Wolfsonian-Florida International University (FIU) in partnership with Miami-Dade County Public Schools, VUE, faculty from FIU College of Education, and a team of independent education researchers from Curva and Associates. Visual literacy instruction in the *Artful Citizenship* model utilizes VTS, and the Curva and Associates (2005b) evaluation used a “Visual/Critical Literacy Assessment” instrument, the Visual Literacy Assessment Survey,²² which draws on the VTS methodology.

²⁰ Described in Appendix B.

²¹ Described in Appendix B.

²² Described in Appendix B.

Appendix B:
Tools for Measurement and Resources

Appendix B: Tools for Measurement and Resources

In the literature reviewed, we looked for examples of assessments and other tools created to measure student or teacher characteristics or outcomes. We found a number of tools that can be helpful to other researchers and educators. This appendix is organized into the following four sections:

1. Tools for measuring teacher practice outcomes
2. Tools for measuring students' social emotional outcomes
3. Assessments that measure student process outcomes
4. Other helpful resources

Tools for Measuring Teacher Practice Outcomes

Several types of tools are used to measure teacher outcomes, including interview protocols, observation forms or rubrics, and surveys or questionnaires. Examples include the following instruments.

The Classroom Assessment Scoring System (CLASS)

CLASS is a research-based observation instrument used to assess classroom quality in preschool through 12th-grade classrooms (Pianta et al., 2008). It focuses on teacher–student interactions in three domains: emotional support, classroom management, and instructional supports. Ten dimensions fall within these domains: positive climate, negative climate, teacher sensitivity, regard for student perspectives, behavior management, productivity, instructional learning formats, concept development, quality of feedback, and language modeling (Pianta et al., 2008).

CLASS was designed to create a common vocabulary that could be used to describe components of quality across different classrooms. CLASS and its dimensions were developed based on a review of literature, a review of scales used in large-scale classroom observation studies, and a review of constructs assessed in classroom observation instruments, as well as on extensive piloting (Pianta et al., 2008).

CLASS is notable because it is being used extensively around the country as a part of studies and evaluations—for example, CLASS is required in every Head Start classroom in the United States (Collaborative for Academic, Social, and Emotional Learning, 2011). For definitions of each of the dimensions and information about how to use CLASS, see Pianta et al., 2008.

Randi Korn and Associates Classroom Observation Form (2005)

As a part of a 2005 study, Randi Korn and Associates developed a classroom observation form that captures student and teacher behavior. The teacher-behavior part of the form measures the extent to which teachers exhibit a number of behaviors important to the TLTA arts-integration program. These behaviors include (1) encouraging thorough description, (2) focusing description on artwork or text, (3) eliciting multiple responses, (4) asking for interpretations, (5) accepting and validating many interpretations, (6) responding to unfounded answers, (7) eliciting multiple

interpretations, (8) eliciting responses to one interpretation, (9) prompting students to support interpretations with evidence from artwork or text, (10) schema building, (11) enthusiasm, (12) use of multiple strategies, (13) observing wait-time, (14) image/text selection, (15) question formation, (16) summarizing, and (17) transfer. The form asks users to rate teachers' behaviors with regard to each of these outcomes using a three-point scale, and a rubric defines a score of 1, 2, and 3 for each component. The form is included in the 2005 Randi Korn and Associates report (pp. 125–129).

Randi Korn and Associates (2010) Observation Constructs

As part of a 2010 study of the *Art of Problem Solving* arts-integration program, Randi Korn and Associates observed whether or not teaching artists employed 12 behaviors. These behaviors include using the following strategies.

Four general Learning Through Art (LTA) teaching strategies:

1. Refer to students as artists
2. Refer to the essential question
3. Provide students enough time to explore materials
4. Provide feedback to individual students as needed

Four strategies believed to cultivate problem-solving skills:

1. Acknowledge multiple approaches and individual solutions
2. Question assumptions and follow one's curiosity
3. Think intentionally and make deliberate choices
4. See mistakes/problems/challenges as solutions

Four ways in “which teaching artists may convey these strategies:”

1. Recognizing
2. Challenging
3. Modeling
4. Showing example

For detail on these behaviors, see Randi Korn and Associates (2010).

DELTA Artist-Classroom Teacher Interview Protocol

Scripp (2007) includes an artist/classroom teacher interview protocol as a part of the DELTA study. Because many of the studies and evaluations of arts-integrated programs that we reviewed utilize interview data, we include brief information about the protocol as an example.

The protocol asks interviewees to speak about the impact of the DELTA arts-integration program on their own personal teaching practices. Specifically, it asks about (a) what sort of practices

related to the DELTA project became integrated with early childhood arts or language literacy skills, (b) what particular arts literacy skills lend themselves better to integration with early childhood language literacy than others and why, (c) how participating in the DELTA project has changed the way the interviewee thinks about language literacy learning when integrated with arts literacy, and (d) how participating in the DELTA project changed the way that the interviewee thinks about the role of arts learning when directed towards the concept of literacy.

The protocol also includes four other topics: project-level support to teachers, student growth, the development of new forms of arts learning and/or arts-integrated language literacy practices, and the impact of arts integration on classroom and school culture. For details, see Scripp (2007, pp. 186–187).

Tools for Measuring Student Social Emotional Outcomes

Early Childhood Measurement Tools

Researchers have developed several compendia of early childhood measurement tools, including social emotional learning assessments. Kendziora et al. (2010) compiled a list of these compendia. They include the following:

- California Institute for Mental Health. (2005). *The compendium of screening tools for early childhood social emotional development*. Sacramento: Author. Retrieved from <http://www.cimh.org/downloads/The%20Infant,%20Preschool,%20Family,%20Mental%20Health%20Initiative%20Compendium%20of%20Screening%20Tools%20for%20Early%20Childhood%20Social-Emotional%20Deve.pdf>
- Child Trends. (2004). *Early childhood measures profiles: A compendium of measures (2nd edition)*. Washington, DC: Author. Retrieved from http://www.childtrends.org/Files/Child_Trends-2004_09_01_FR_ECMeasures.pdf
- Child Trends. (2010). *Quality in early childhood care and education settings: A compendium of measures (2nd edition)*. Washington, DC: Author. Retrieved from http://www.childtrends.org/Files/Child_Trends-2010_03_10_FR_QualityCompendium.pdf
- Denham, S. A., Ji, P., & Hamre, B. (2010). *Compendium of social-emotional learning and associated assessment measures*. Chicago, IL: CASEL.
- Henderson, J., & Strain, P. S. (2009). *Screening for delays and problem behavior (Roadmap to Effective Intervention Practices)*. Tampa: University of South Florida. Retrieved from http://challengingbehavior.org/do/resources/documents/roadmap_1.pdf
- Mathematica Policy Research. (2003). Resources for measuring services and outcomes in Head Start programs serving infants and toddlers. Chicago: Author. Retrieved from http://www.acf.hhs.gov/programs/opre/ehs/perf_measures/reports/resources_measuring/resources_for_measuring.pdf
- Ringwalt, S. (2008). *Developmental screening and assessment instruments with an emphasis on social and emotional development for young children ages birth through five*. Chapel Hill: The University of North Carolina, FPG Child Development Institute,

National Early Childhood Technical Assistance Center. Retrieved from <http://www.nectac.org/~pdfs/pubs/screening.pdf>

A “Consumer Reports” for Social Emotional Learning Assessments

Kendziora et al. (2011) also developed a “consumer reports” for social emotional learning assessments. This report includes teacher rating scales and student self-reports but not third-party observation methods or performance-based assessments. The tools were considered for eight criteria,²³ and the report recommends two teacher rating scales: the Devereux Student Strengths Assessment and its companion, the Devereux Early Childhood Assessment.

The Artful Citizenship Psychosocial Survey

Curva and Associates (2005) developed a psychosocial survey to include in their analysis of the VTS-infused Artful Citizenship program, intended to measure art self-concept, art enjoyment, academic self-concept, and school and civic responsibility. They researched relevant commercially available instruments and selected four instruments to be used in the development of the survey. These four include *Civic Responsibility Survey for K–12 Students Engaged in Service-Learning*; *Art Self-Concept Inventory*; *The Self-Concept of Ability Scale: Elementary Form, Positive Action, (Grades K–3)*; and *Key to Questions for Self-Concept* (Curva & Associates, 2005, p. 18).

Assessments That Measure Student Process Outcomes

There have been some studies in which researchers have designed or used performance assessments to measure students’ process abilities. We include information about these assessments in this section.

The Snapshots of Early Arts Learning (SEAL) Assessment

Scripp (2007) designed a assessment for Grades 1–3 to capture the gains from the CAPE integration intervention more precisely than the standard assessments were able to capture them. The team believed that this assessment would parallel the structure and content of language arts literacy skills in place in the Chicago schools.

The SEAL assessment is divided into a performance section and a reflective section. In the performance section, students are asked to create something in a structured setting and are observed. In the reflective section, students are interviewed about their own art, other students’ art, and art in general. Questions in each section are designed to address both concepts and processes (Scripp, 2007, p. 123).

²³ (1) Measurement of SEL constructs and relevant documentation, (2) appropriateness for prekindergarten to fifth grade, (3) timeframe for administration, (4) reliability and validity, (5) reliability estimates and other psychometric evidence, (6) availability of norms aids, (7) availability of electronic administration and scoring methods, and (8) cost.

Assessment tasks were piloted at three high-poverty case-study schools, and tasks were customized to fit the curriculum practices of the individual schools. Assessment versions included performance tasks in music, visual art, and theatre. For instance, at one case study school (Miles Davis), a theater performance assessment was developed that aimed to test the extent that students' new theater knowledge would inform understanding of stories (see Scripp, 2007, pp.136–137 for more detail, including a description of specific tasks). The study included both within- and across-school comparisons (Scripp, 2007, p. 120).

A number of problems surfaced after the development of the tests.

The state early literacy test was discontinued without warning, so the parallel features were lost.

Conditions of pretesting and posttesting changed within the academic year, and thus the pretest and posttest assessment design was lost, limiting the test's ability to measure impact.

The report describes the development and administration of the test. Scripp (2007) summarized the principal findings, which include the ones that follow (see Scripp, 2007, pp. 120–164 and pp. 173–174 for more detail).

The Combined Effect of SEAL Performance Tasks

Comparisons between SEAL tests and standardized language literacy tests could not be made because of insufficient data or the inability or reluctance of some schools to make these data available (Scripp, 2007, p. 173).

Growth in Reflective Understanding of Art and Artistic Process

Scripp (2007) reports that the averaged pretest–posttest SEAL performance task results combined across music, visual art, and theater indicate that statistically significant gains in arts learning occurred during the cumulative process of two 10-week DELTA units (p. 174).

The Relationship Between Performance and Reflection SEAL Test Results

Scripp (2007) reports that results from the consistently administered parts of the pretest–posttest SEAL interviews indicate that the level of student reflective understanding of art-making processes increased in sophistication as the DELTA project progressed (p. 174).

The Student Performance Assessment

Project Zero researchers Tishman et al. (1999) administered a different type of locally developed assessment to assess “critical thinking” gains in students who participated in MoMA's Visual Thinking Curriculum (VTC).

The VTC is an inquiry-based method of exploring art that aims to develop students' thinking skills through viewing and discussing art. The yearlong curriculum is written for use by fourth and fifth graders, although it has been used in grades from kindergarten to high school. Project Zero researchers in this yearlong study (October 1998–August 1999) focused on whether VTC cultivated students' thinking skills. Researchers compared outcomes for students who

participated in the VTC curriculum with outcomes for students who participated in a mixed-methods experimental study. The research focused on two questions: (1) Were students developmentally capable in engaging in the kind of evidential reasoning the VTC asks for, and (2) did participation in VTC help increase students' evidential reasoning skills? Tishman et al. (1999) summarize the Student Performance Assessment:

The Student Performance Assessment...is a written activity that asks students to look at an art image and respond in writing to the fundamental VTC questions, **What's going on in this picture?** and **What do you see that makes you say that?** It consists of two parts: an "Art Activity," and another activity called the "Footprints Activity." The Arts Activity asks students to use the VTC questions to respond to an art image from MoMA's collection. The Footprints Activity asks students to use the VTC questions with a nonart image from the domain of science. (p. 6)

This assessment was administered at the beginning and the end of the school year for students in the VTC group and the control group. Areas of analysis included (a) evidential reasoning, (b) circular reasoning, (c) awareness of subjectivity, (d) quality of descriptive detail, and (e) quantity of descriptive detail.

For (a), scorers looked for structurally sound evidential reasoning (i.e., an appropriate balance between evidence and interpretation and relevant evidence). Scorers were not using "correctness of interpretation" as a criterion. Responses were scored on a scale of 1 to 3. Tishman et al. (1999) call it a "rough" scale that was meant to rate the quality of the structure of the reasoning in the response and not the eloquence or creativity of the ideas.

Tishman et al. (1999) report that participation in VTC did help increase students' evidential reasoning skills, as measured by the exam. Researchers reported that, on average, involvement in VTC contributed to a modest but statistically significant 20 percent increase in students' ability to engage in evidential reasoning about an art image ($p < .05$). Tishman et al. (1999) also reported that increases in students' evidential reasoning and awareness of subjectivity appear to transfer to a nonart science context, as shown by the FootPrint Activity.

Aesthetic Development Interview (ADI) and Material Object Interview (MOI)

The Visual Thinking Curriculum (VTC) has since been renamed Visual Thinking Strategies (VTS). About the same time as the Project Zero study (October 1998–August 1999), Abigail Housen and her colleagues completed an independent five-year longitudinal study (1993–98) focused on the VTS curriculum and its relationship to student outcomes. The researchers implemented the VTS curricula and VTS teacher-training for treatment students and observed treatment and control students in each of two age groups (beginning with second and fourth graders) in Byron, Minnesota. To assess student outcomes, Housen used two principal instruments: the *ADI*, which asks students to discuss art and the *MOI*, which asks students to discuss a nonart object. Housen's report explains that *ADI* and *MOI* are "non-obtrusive, non-directive, stream-of-consciousness-interviews" or monologues "which effectively sample a person's thinking process" (Housen, 2002, p. 103). Researchers compare the content of these interviews to determine the extent to which (1) students exhibit certain thinking behaviors when

talking about art, and (2) students exhibit certain thinking when talking about a nonart object (or, that they *transfer* these behaviors).

To analyze students' responses, researchers break down the text of these monologues (students' words) into short, independent "thought units." An example of two thought units is "I think the trees are black/and some of them are tall" (Housen, 2002). The thought units are then coded in two ways—according to "**Aesthetic Stage**" (for ADI only) and for "**critical thinking counts**" (for MOI and ADI).

Housen's "**Stages of Aesthetic Development**"²⁴ sort process abilities that students exhibit when viewing art into developmental stages. These abilities range from *Accountive*, where viewers are "list-makers and storytellers" who offer "simple and concrete observations" to *Re-Creative*, where experienced viewers "willingly suspend disbelief" and see art objects as having a life of their own (Housen, 2007). To score the ADI, researchers classified thought units using categories in the Aesthetic Development Coding Manual (Housen, 2002) and then gave an "Aesthetic Stage score" to the overall thought patterns of the subjects (Housen, 2002).

Housen's report characterized **critical thinking** as "the art of thinking about your thinking" (Paul, 1990). Researchers coded **critical thinking scores** for this study as the sum of the counts of students' "supported observations" and "speculations," where supported observations are "thoughts that entail an assertion that is grounded in evidence, and speculations are "thoughts about a possible meaning or outcomes based on evidence" (Housen, 2002).

Researchers reported that the results of the five-year study "support the hypothesis that the curriculum accelerates aesthetic growth" and offer evidence that "VTS causes the growth of critical thinking and enables its transfer to other contexts and content" (Housen, 2002). A detailed description of findings for each of five hypotheses can be found in the report (Housen, 2002, pp. 107–113).

²⁴ Abigail Housen's "**Stages of Aesthetic Development**" sort process abilities that students exhibit when viewing art into developmental stages. Housen describes these stages in *Art Viewing and Aesthetic Development: Designing for the Viewer* (Housen, 2007). According to Housen, in **Stage 1, Accountive**, views are list-makers and story tellers, who make simple and concrete observations (e.g., "Lines, ovals, squares..." [Picasso, *Girl Before a Mirror*]). In **Stage 2, Constructive**, students look at art using the most "accessible tools at hand"—their perceptions, their knowledge of the natural world, and the values of their social and moral world ("They have five fingers, just like us." [Picasso, *Girl Before a Mirror*]). In **Stage III, Classifying**, learners adopt the "analytical and critical stance of the art historian," looking to identify the work as belonging to a place, school, style, time, and provenance. In **Stage IV, Interpretive**, viewers seek an interactive and spontaneous encounter with a work of art ("I don't think that [drawing the human form] was what he [the artist] really had in mind as being important..." [Matisse, *Dance*]). In **Stage V, Re-Creative**, viewers, having a long history of viewing and reflecting about works of art, now "willingly suspend disbelief." The viewer sees the object as "semblant, real, and animated with a life of its own." ("The more I look at the painting, the more I have this sense of the sexuality as being a kind of pressure that pushes away from the canvas but in some ways is tightly held by the canvas itself." [Picasso, *Les Demoiselles d'Avignon*]) (Housen, 2007, pp. 2–8).

Visual Literacy Assessment Survey

The Visual Literacy Assessment Survey is a third VTS-based assessment instrument, used as part of Curva and Associates' (2005) three-year evaluation of the pilot program *Artful Citizenship*. *Artful Citizenship* is "an arts-integrated social studies curriculum project" in Miami Dade that employs VTS methodology and was funded by an AEMDD grant (Curva & Associates, 2005). As a part of the evaluation, the Visual Literacy Assessment Survey was administered to third, fourth, and fifth graders in three treatment schools and one comparison school, in a pretest/posttest design. The instrument asks students to view two images (reproductions of paintings) and respond in writing to VTS questions: (1) *What is going on in this picture? What do you see that makes you say that?* and (2) *What more can you find?* It is designed to measure a student's skill in "visual literacy," or the ability to interpret visual images and think critically about them, especially about social studies issues. Researchers then coded students' pretest and posttest responses according to a rubric, which asks raters to evaluate the extent to which responses exhibited *animation*, *analysis*, *interpretation*, and *description* across six levels (from *limited*, a score of 1, to *sophisticated*, a score of 6). The rubric was developed from an earlier version specifically for this evaluation. For detail on the history and rationale for the rubric as well as scoring, see pages 22–27 of the evaluation. For the rubric itself, including definitions of *animation*, *analysis*, and so forth, see Appendix H of the evaluation (Curva & Associates, 2005).

Researchers reported that students who received the Artful Citizenship program for three years had a higher rate of growth in visual literacy than students in a comparison school ($p < .0450$) (Curva & Associates, 2005, p. 51).

Teaching Literacy Through the Arts (TLTA) Student Interviews: The Gorky Painting and the Kadohata Text

As part of an evaluation of the *Teaching Literacy Through the Arts* study of the LTA program, Randi Korn and Associates (2005) undertook a different type of performance assessment. Researchers administered structured interviews to two treatment groups and a control group of third graders and compared how well responses exhibited four key process abilities: hypothesizing, evidential reasoning, building schema, and multiple interpretations.

Researchers also analyzed the grade level of the words and the count of words used by students in their responses. The interviews included three parts: (1) questions about a piece of a students' own artwork, (2) questions about the painting *The Artist and His Mother* by Arshile Gorky, after it was shown to the student (referred to as "the Gorky painting"), and (3) questions about a piece of text from the novel *Kira-Kira* by Cynthia Kadohata, after it was read aloud to the student (referred to as "the Kadohata text"). Questions about the Gorky painting and the Kadohata text were similar.

Principal findings of the interview content analysis from this study (and from the interview content analysis of a subsequent second year of the study) are summarized in the executive summary report (2007) and include the following:

When the content of students' responses to the Gorky painting and the Kadohata text were scored for six literacy characteristics, treatment-group students scored higher on five of the six literacy characteristics than did control students).

Researchers reported that three variables were significant for predicting Gorky painting scores: a high word count, participating in the treatment group, and a more positive attitude toward art (i.e., a higher total score on six art attitude scales). (Randi Korn & Associates, 2007, p. 4)

Learning Through Art (LTA) Design-a-Chair Student Interviews and Observations

Recently, Randi Korn and Associates administered another performance assessment, as a part of the 2007–09 study of LTA, *The Art of Problem Solving* (2010). Researchers administered a “Design-a-Chair” activity to fifth-grade students from six schools and then interviewed students afterwards, comparing a treatment group with a control group. The activity asked students to design a chair in 15 minutes, using at least three different materials, during which time trained data collectors observed. Researchers then analyzed the different groups' work and interview responses with regard to six process abilities, which Randi Korn and Associates refer to as “problem solving items”: flexibility, imagining, resource recognition, experimentation, connection of ends and aims, and self-reflection.

Researchers reported that treatment groups scored higher than control students on connection of ends and aims, flexibility, and resource recognition III; treatment groups scored lower than control groups on experimentation II; and in all other areas, there was no statistically significant difference between treatment and control groups (Randi Korn & Associates, 2010, p. viii).

Discussion

The SEAL, Student Performance Assessments, ADI and MOI, the Visual Literacy Assessment Survey, the TLTA Gorky and Kadohata Interviews, and the LTA Design-a-Chair activities were found to be useful in the measurement of student outcomes after arts-integrated instruction. The extent to which other researchers have used and have adapted these assessments has not been investigated as part of this paper. However, our understanding is that it has been typical for unique assessments to be created for evaluations of both large-scale and small-scale program interventions.

There are also several accepted standardized paper-and-pencil test instruments that are designed to measure creativity and can be used in a wide variety of contexts. Treffinger et al. (2002) reviews such instruments and recommends three that warrant consideration for school use and can be administered to elementary students: *TCAM: Thinking Creatively in Action and Movement* (#70) for young children only, *TTCT: Torrance Tests of Creative Thinking* (#72) for Grades 4 through adult, and the *SEA test* (#12) for upper elementary students. The Torrance test of creativity is the most widely used and has been administered around the country to identify gifted children (Kim, 2006). The literature does not cover how these creativity test instruments might be used to examine the effectiveness of arts-integration programs. Unlike the performance assessments discussed in this paper, these creativity test instruments were developed outside of the context of one specific arts-integration program.

Other Helpful Resources

Treffinger and colleagues' (2002) guide reviews creativity assessment resources. The publication notes that two databases—one providing information about creativity assessment instruments and one dealing with critical thinking instruments—correlated with the guide and can be accessed at the Center for Creative Learning Website (www.creativelearning.com). The databases include information about nearly 100 tests, rating scales, checklists, self-report inventories, and other tools that have been prepared to assess the creativity characteristics and skills presented in this guide. (These tools were drawn from a pool of more than 150 instruments and resources that we located during our extended search for instruments.) The guide also includes a step-by-step “how-to” for choosing a creativity assessment.

The Task Force on Children’s Learning and the Arts: Birth to Age Eight (1998) and the Wolf Trap Institute each include a list of relevant STEM early learning through the arts reference books. The Wolf Trap Institute’s list can be found at the following link: http://www.wolftrap.org/Education/Institute_for_Early_Learning_Through_the_Arts/~media/Files/PDF/STEM_reference_booklist.ashx.

For more information on the teaching artist experience, Waldorf (2004) and Ingram (2007) report on teaching artists’ perspectives on their work in AAA and CAPE schools.

There has been some work done in creating “standards” for what constitutes quality arts integration, although these standards are not definitive. Burnaford (2007) summarizes the

standards that have been developed in a chapter in her literature review (p. 5). More work has been done on what constitutes quality arts education more generally, and this work is addressed by Seidel et al. (2009) in *The Qualities of Quality: Understanding Excellence in Arts Education*.

The book *National Standards for Arts Education: What Every Young American Should Know and Be Able to Do in the Arts* contains content and achievement standards for music, dance, theatre, and visual arts for Grades K–12 (Consortium of National Arts Education Associations, 1994).

ABOUT AMERICAN INSTITUTES FOR RESEARCH

Established in 1946, with headquarters in Washington, D.C., American Institutes for Research (AIR) is an independent, nonpartisan, not-for-profit organization that conducts behavioral and social science research and delivers technical assistance both domestically and internationally. As one of the largest behavioral and social science research organizations in the world, AIR is committed to empowering communities and institutions with innovative solutions to the most critical challenges in education, health, workforce, and international development.

LOCATIONS

Domestic

Washington, D.C.
Atlanta, GA
Baltimore, MD
Chapel Hill, NC
Chicago, IL
Columbus, OH
Concord, MA
Frederick, MD
Honolulu, HI
Naperville, IL
New York, NY
Portland, OR
Sacramento, CA
San Diego, CA
San Mateo, CA
Silver Spring, MD

INTERNATIONAL

Egypt
Ethiopia
Georgia
Haiti
Honduras
Kenya
Liberia
Malawi
Nicaragua
Pakistan
South Africa
Zambia



AMERICAN INSTITUTES FOR RESEARCH®

1000 Thomas Jefferson Street NW
Washington, DC 20007-3835
202.403.5000 | TTY: 877.334.3499
www.air.org

Making Research Relevant