

Evaluation Report



ArtsLink

Building Mathematics and Science Competencies through an Arts Integration Model Year Four

Project funded by United States Department of Education, Office of Innovation and Improvement, Arts in Education Model Development & Dissemination Program



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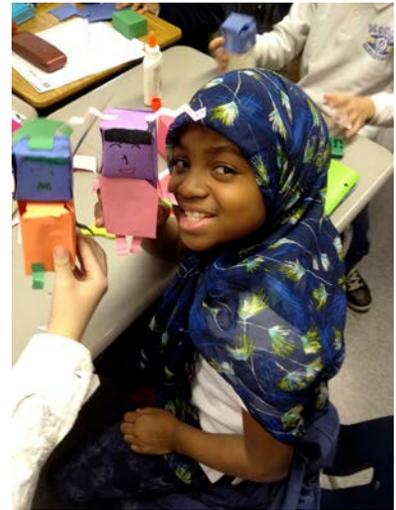
The Philadelphia Arts in Education Partnership (PAEP) is pleased to present this report documenting the evaluation results of its program, Arts Link: Building Competencies in Mathematics and Science through an Arts Integration Model, a research project funded by a four-year \$1.1 million grant from the United States Department of Education, Office of Innovation and Improvement, Arts in Education Model Development and Dissemination Program (AEMDD). This support allowed PAEP to expand the scope of its research on arts integration best practices and to refine its Arts Concept and Skill Alignment Model for future replication and dissemination.

Arts Link was developed in response to findings from earlier work integrating the arts with elementary grade level reading and writing curricula to promote literacy skill acquisition through an AEMDD grant made to the School District of Philadelphia in collaboration with PAEP in 2006. The most notable success of this prior project, Arts Bridges, reported a 15% increase in reading proficiency among participating students over those in the corresponding control group, a stunning achievement for an urban, inner-city school district.

The results of Arts Bridges also indicated that to maximize the impact of an arts integration program, students must be introduced to this learning approach earlier in their educational careers. Therefore, PAEP designed the Arts Link program to reach students as early as second through fifth grade in four School District of Philadelphia schools with a corresponding complement of eight control schools. This school based program is implemented by teaching and learning teams led by the art teacher and comprised of two participating classroom teachers per grade level with master teaching artists in residence for 8 months during the school year. Each cohort teaching team received ongoing extensive professional development that explored ways in which to effectively integrate critical grade-level mathematics and science skills with arts curricula, as defined by the District's content area goals. An arts integrated program infrastructure was established upon which to develop scope and sequence curricula for classroom implementation utilizing PAEP's concept and skill alignment and co-teaching models. Continual assessment of instruments developed to facilitate planning and execution of these models led to their refinement, which improved the ease and effectiveness of their use as collaborative tools by participants in this study.



This arts integration concept and skills alignment model does not supply lesson plans or curriculum. It does provide a structure, a curriculum framework, to organize and deliver required core academic and art content, determine student learning goals and activities, and implement a guide for co-teaching that includes assessment of student learning and strategies to meet Pennsylvania Common Core State Standards. Project content is anchored in PA/CCSS and School District of Philadelphia grade level curriculum. By using “Big Ideas” and “Essential Questions” to guide arts integrated curricular development, the model taps into higher order thinking skills as defined by Webb (1997) in “Depth of Knowledge”. Teachers plan together with the teaching artist and art teacher to reinforce concepts through multiple perspectives and experiences, and artists facilitate art making projects tied to curricula required to be learned during each marking period. The use of our researched and tested unit and lesson plan templates enabled teachers, art teachers, and teaching artists to co-plan, selecting student learning objectives from the quarterly curriculum on which to focus learning. Using these templates as an organizational structure allow teachers and artists to create and individualize learning plans tailored to the needs of their students who are always at the center of learning.



A scientifically-based research methodology examined the impact of this teaching and learning model on: strengthening students’ arts, mathematics, and science competencies, improving students’ standardized test scores, pro-social behaviors, and attitudes toward school; and enhancing teacher pedagogy. Evaluation was conducted by an independent evaluation team who analyzed both quantitative and qualitative data including but not limited to student scores on standardized tests, unexcused absences, and suspension rates. Additionally, the team evaluated measures to improve teacher pedagogy. The success of the Arts Link: Building Mathematics and Science Competencies Through an Arts Integration Model as evidenced in all program evaluation outcomes is due in large measure to the development and implementation of innovative methodology and pedagogy, which relied on formative assessment to drive the evolution of all aspects of

the program including project infrastructure, professional development content and delivery structures, program curricular content and classroom delivery methods, and inquiry and evaluation of factors in addition to the GPRA measures. These included supplemental surveys to assess the important attributes of school culture that can lead to overall effectiveness as well as assess the involvement of parents/guardians in the education of their children to examine, in both cases, the extent to which participation in the Arts Link program improves scores over time for the treatment group and creates an increase in treatment scores as compared to the control group.



Program Objectives

1. Select schools for participation, conduct random assignment of eligible schools into treatment and control groups, and form teaching/ learning teams in intervention schools.
2. Successfully deliver Arts Link Professional Development Program
3. Enhance classroom teacher skills in the following areas:
 - a. Pedagogical and classroom management skills relating to the use of differentiated instruction to build mathematics and science skills in students;
 - b. Classroom teacher capacity to design and implement arts-integrated instructional strategies to deliver mandated curriculum;
 - c. Classroom teacher capacity to engage in productive partnerships with Art Teachers and Teaching Artists to deliver mandated curriculum; and,
 - d. The ability of the Art Teacher to assume a leadership role in the establishment of a partnership between classroom teachers and master teaching artists to utilize arts-integrated instructional strategies to deliver mandated curriculum.
4. Improve students' attitudes towards self, school, and the arts, fostering pro-social behavior in the school setting and improve student academic behavior in terms of study habits, homework completion, and parental/guardian involvement in academic assignments;
5. Improve students' academic performance in mathematics and science; and,
6. Improve students' skills in creating, performing, and responding to the arts.

By the end of project years three and four, what emerged and finally crystallized were two conceptual precepts for the work; one is the evolution of PAEP's definition of Arts Integration and the other a clear articulation of the PAEP Model. Arts Integration is a strategy for teaching and learning that engages the arts as central to the acquisition of concepts and skills required to master other core academics. PAEP's Arts Link model is a research-based methodology for teaching and learning that recognizes concepts, skills, and processes common to both the arts and academic subjects, aligns them, and incorporates them through a comprehensive experiential approach that informs the arts and academics by acknowledging their reciprocity, thus facilitating authentic learning across the prescribed core curriculum.



We have considerable evidence, both empirical and anecdotal, that Arts Link resulted in significant outcomes for targeted stakeholder groups. This is particularly evident when comparing evaluation results from the first two years with those obtained in years three and four. Reported educator skill acquisition years three and four were significantly higher than those reported in the first two years. In addition, the gap between the treatment and control scores were also greater in years three and four than in the initial two years.

Student performance in the mathematics and science PSSA standardized test scores were on the rise during the final two years of the project and the gap between the treatment and control schools was greater during this time period as well. Finally, the reported number of student artifacts reached a plateau during the final two years, where scores were significantly higher than in the initial two years of the project.

Taken as a whole, these results suggest a threshold effect takes place with the first two years serving to acclimate students and educators into the co-curricular design process, initiate educator and administrator engagement, and begin the process of transforming how classroom teachers approach arts integration in their classrooms. As a result, the changes noted in this final report did not occur in a linear fashion; rather, they are the product of a two-step process first occurring in the initial two years, and then realized in the final two years.



I. Summative Program Evaluation: Outcomes Assessment

- Participating educators found Arts Link’s professional development to be relevant, directly applicable to their classrooms and helpful in enhancing the delivery of mandated curricula. Throughout the 4 years of the Arts Link program, the professional development target outcomes were fulfilled for 95% or more of the participants. In addition, participants reported the acquisition of practical skills and tools that could be directly applied to classroom situations. There was a significant increase in nearly all of the targeted educator skills in the last 2 years as compared with the first 2 years and the mean scores for the majority of the teacher skill criteria were significantly higher ($p < .05$) for the Arts Link schools as compared to the control group schools.

2013-2014 Arts Link - Professional Development Teacher Outcomes

N=61	% Strongly Agree or Agree
Participants were able to transfer PD content to the classroom.	98
Enhanced confidence in using arts integration strategies to meet student needs.	98
Enhanced ability to align math, science and art skills.	96
Enhanced understanding of how to collaborate with the artist/teacher.	98
Enhanced perceived value of collaborating with other teachers in their schools.	96
Perceived value in using the Grade Level Planning Template.	95

- In the final year of the Arts Link project, treatment school students had significantly lower absence and suspension rates as compared to control group school students. These differences were variable throughout the course of the project, with some years yielding equivalent results and other years where differences were more substantial.
- In the final 2 years of the Arts Link project, the mean scores on the mathematics PSSA test were significantly higher ($p < .01$) for the Arts Link schools as compared to the control schools. The mathematics PSSA scores were equivalent during the first 2 years of the project. Over the course of the last 3 years, the percentage of students scoring at the “advanced” level in mathematics in the Arts Link schools increased substantially.
- In the final year of the Arts Link project, the mean scores on the science PSSA test were significantly higher ($p < .01$) for the Arts Link schools as compared to the control schools. The mean scores on the science PSSA test were substantially higher ($p = .10$) for the Arts Link schools as compared to the control schools in year 3. The performance level percentages for each of the years were equivalent except for year 2, which had a significant decrease in scores as compared to the other three project years.

2013-2014 Arts Link

Pennsylvania System of School Assessment
 Mean Scores
 2nd, 3rd, 4th, and 5th grades

	Comparison	Arts Link
Mathematics	1270	1375
Science	1308	1368
Reading	1235	1283

- The number of student created artifacts increased significantly in the last two years of the Arts Link schools yielding results that were a 3-fold increase over baseline levels.

II. Formative Program Evaluation: Lessons Learned

- It is critical to gain principal buy-in throughout the duration of the project. We accomplished this by forming relationships with the principals that were strengthened by their participation in meetings with PAEP staff, focus groups, interviews, and by making them feel as if they are a valued part of the Arts Link team at their school.
- It is critical to address challenges raised by participants and give all educators a voice in addressing implementation issues. We utilized a process of periodic educator report outs to identify these issues and integrated problem solving sessions into our professional development. For example, educators identified a lack of storage and inadequate planning time as challenges. We addressed this through provision of storage cabinets in the classrooms and the integration of planning time into teacher professional sessions.
- Art Teachers did not have adequate time or flexibility in their schedule to participate fully in professional development. Extra steps need to be taken to negotiate their participation with supervising principals and to integrate them with the cohort of teachers and teaching artists.
- Educators responded very favorably to the provision of templates for planning and curriculum development. Nearly all reported high value in using co-teaching template and grade level planning templates. Participating educators valued tools and methods that could be immediately implemented into their classrooms.
- One of the keys to success in our professional development model was the ability for teachers to design their own curricula and implementation plans. As a result, they were active participants instead of passive recipients of instructional content.

III. Best Practices for Model Dissemination

- Utilize a participant selection and screening process to make sure participating schools are committed to the project for its duration. Principal buy-in is essential. Socialize principals to be true partners in the process and be explicit on what they have to gain through participation.
- Professional development should be delivered in workshop format; participants need to leave with practical strategies that can be immediately implemented into their classrooms. It is key that participants not be passive recipients of information.
- Cultivate a relationship with “control group” schools so they remain committed to providing reliable and valid evaluation data throughout the duration of the project. The school principals should facilitate this process and understand how their schools interests are enhanced through participation.
- Take steps to create a “project culture” among teachers during the professional development sessions that continues in schools; In Arts Link, this led to the sharing of best practices, cooperative problem solving, and an overall spirit of educational excellence.
- Organize the program so it doesn’t “cost” educators any time to meet grade level extracurricular requirements. Arts Link was not an overlay of a new “program”, but a way to help educators deliver mandated curricular content in a more effective manner through integration of the arts.
- Educators need to be treated as partners in program implementation, not passive recipients of services. Fundamental to this is demonstrated respect for educator expertise, acknowledgment of the challenges they face, and a voice in modifying program content as needed.
- Program design needs to consider that most of the participants are middle or late career educators who may have some initial resistance. Framing participation as a means to a renewed sense of purpose, exposure to cutting-edge pedagogy, and an ability to enhance their schools overall effectiveness were successful in Arts Link’s implementation.
- Educators’ self-perceptions indicated a continuous rise in skill acquisition in the last half of this project. Enhanced educator skill sets contribute to the sustainability of Arts Link beyond the AEMDD U.S. Department of Education funding period.



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