

**PARTNERSHIPS  
IN ARTS INTEGRATION RESEARCH  
(PAIR) PROJECT**

**Final Reports**  
(Updated 12.12.2012)

**Comprehensive Report**

**Part I: Analysis of Teacher Impact**

Analysis of Teacher Professional Development Outcomes and Their Possible Relationship  
with Student Learning Outcomes

*(Dr. Gail Burnaford, September 2010]*

**Part II: Analysis of Student Academic Performance Impact**

A Comparative Analysis of Control-Treatment School Student Standardized Academic Test Learning  
Outcomes by All School Types and Student Academic Classifications

*(Dr. Lawrence Scripp, June 2011]*

**Part III: Analysis of PAIR Student Arts Integration Assessments and  
the Intersections Between Teacher and Student Performance Outcomes**

PAIR Student Learning and Survey Results and a Comprehensive Statistical Analysis of their Links  
with Teacher Professional Development and

Student Standardized Test Outcomes by all Demographic Factors

*(Dr. Lawrence Scripp, April 2012]*

**Addendum A: A Brief Summary of Findings from the PAIR Report**

*Meeting the burden of proof: Statistical evidence for the impact of arts integration based on causal  
links among teacher professional development, arts learning and academic outcomes.*

*(Dr. Lawrence Scripp, April 2012 and Laura Tan Paradis, December 2012)*

**Addendum B: A Powerpoint Summary of Findings  
from the PAIR Report**

*Arts Learning Assessment Practices and Analytic Processes in the Partnership for  
Arts Integration Research (PAIR) Project*

*(Dr. Lawrence Scripp, April 2012 and Laura Tan Paradis, December 2012)*

## **PAIR Project Executive Summary**

The PAIR (Partnerships for Arts Integration Research) COMPLETE FINAL REPORT is an evaluation of a four year, federal Department of Education funded Arts in Education Model Development and Dissemination (AEMDD) project administered by the Chicago Arts Partnerships in Education (CAPE) in partnership with the Chicago Public Schools. This project brought together 3 pairings of school populations (a world languages focused magnet cluster school with a fine-arts focused magnet cluster school; a math and science focused magnet cluster school with a fine arts focused magnet cluster school; and a literature and writing focused magnet cluster school with a fine arts magnet cluster school) to work with teaching artists in 4th, 5th, and 6th grade classrooms. Results from the six schools were compared with six control schools of similar status, resources, student population, demographic factors, and comparable levels of academic achievement prior to the start of the PAIR project.

The PAIR research and evaluation focuses extensively on teacher impact and student achievement. Two principal investigators noted for their work in the fields of teacher education, student learning, and arts in education teaching and learning practices engaged in this research: Dr. Gail Burnaford, School of Education faculty at Florida Atlantic University, who examined the impact of PAIR on classroom teachers, and Dr. Lawrence Scripp, Director of the Center for Music-In-Education, Inc, who analyzed student arts integration and academic learning outcomes and their relation to PAIR teacher professional development outcomes and controlled for student demographic factors. Burnaford's and Scripp's cumulative findings on the impact of PAIR on teacher professional development, student learning and the intersections between teacher and student outcomes over the three-year time period of the project are presented in the three-part comprehensive report.

Lawrence Scripp and Laura Tan Paradis (PAIR research coordinator) provide a brief summary of the project findings as an addendum to the comprehensive three-part PAIR Report.

**PARTNERSHIPS IN ARTS INTEGRATION RESEARCH (PAIR)  
FINAL REPORT**

**Part 1: Teacher Impact  
(September, 2010)**

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The PAIR project was funded through a grant to Chicago Public Schools from the US Department of Education's AEMDD Program. Chicago Arts Partnerships in Education (CAPE) contracted with Chicago Public Schools for this project. CAPE then subcontracted with Dr. Larry Scripp to serve as co-principal investigator for the project in collaboration with Dr. Gail Burnaford, Principal Investigator, Florida Atlantic University.

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## **Introduction**

Forty years ago, there was widespread belief that teachers and schools had little influence on students' achievement independent of their socioeconomic background and context (Jencks, 1972, Coleman, Campbell, Hobson, McPartland, Mood, Weinfeld, and York, 1966). More recent studies of teacher effects at the classroom level, however, such as those using the Tennessee Value-Added Assessment System, have found that differential teacher effectiveness is a strong determinant of differences in student learning, far outweighing the effects of differences in class size and heterogeneity (Sanders & Rivers, 1996; Wright, Horn, & Sanders, 1997).

Students who are assigned to several ineffective teachers in a row have significantly lower achievement and gains in achievement than those who are assigned to several highly effective teachers in sequence (Sanders & Rivers, 1996). Teacher effects appear to be additive and cumulative, and generally not compensatory. These issues have been the topic of much other research over the last 50 years (Darling-Hammond, 1999). More and more research is conducted with teacher practice and professional development as part of the context for investigating student outcomes. That is what the PAIR project has done during this research initiative.

The Partnerships in Arts Integration Research (PAIR) project was a three-year initiative focused on the intersections between arts and non-arts content learning in two mathematics and science, two world languages and two writing Magnet Cluster Schools in Chicago. This section of the final report will focus on the impact of the project on the teachers, with particular attention to the third year of the project in which documentation was more intentional and systematic in each school. The 6 PAIR schools were matched with 6 control schools also in the Arts Magnet Cluster Schools program in Chicago Public Schools. A Year-End Curriculum and Teaching Survey was administered to 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> grade teachers in all twelve schools during Year Three of the project. Other data were also collected from the teachers in the 6 PAIR schools, including professional development session surveys and attendance figures, portfolio conference transcribed comments, student work and teacher practice labels and documentation from work completed at professional development sessions (documentation panels and curriculum maps).

The design of the program, in which the fourth grade teachers participated in Year One of PAIR and contributed to the initial planning process for arts integration, followed by the addition of 5<sup>th</sup> grade



teachers in the second year and 6<sup>th</sup> grade teachers in the third year, will be discussed. PAIR teachers had access to two teaching artists each year in two art forms. The seven goals related to teacher impact in the project were related to the nature and degree of collaboration fostered by PAIR, the curriculum development process and products related to arts integrated content-focused units, and the ways in which documentation and assessment informed teaching, learning and research within the project.

PAIR builds upon the outcomes of a larger three-year Department of Education Professional Development Grant project that ended in 2008 titled Building Learning Communities through Culture, Leadership and the Arts (BCCLA). In that project, 59 Fine and Performing Arts Magnet Cluster Program Schools experienced professional development that supported the development of arts integrated curriculum, leadership, and community. The BCCLA project focused intensive professional development on arts specialists in the Fine and Performing Arts Magnet Schools (Burnaford, 2009). The PAIR project also intended to build community across magnet cluster schools in and through arts integrated curriculum and was designed to engage non-arts teachers in such innovations. The PAIR project involved classroom teachers in six magnet cluster schools, two each in the areas of Writing, World Language, and Mathematics in order to determine how engagement with multiple arts experiences over three years not only develops arts learning but also influences non-arts content learning in students. Consistent with the research, the PAIR project research team investigated what classroom teachers learned in and through PAIR, as per Ball and Cohen's "pedagogy of professional development" (1999), in which there is always a dynamic interaction between teachers, students, curriculum content and the school environment. Research suggests that when teachers' knowledge, skills, and strategic actions are seen as resources, student achievement rises significantly (Phillips, 2003). Any consideration of students' learning within an initiative such as PAIR must also accommodate the investigation of how their teachers are seeing the initiative, accommodating the new practices, and developing their expertise as a result of the intervention.

To that end, the PAIR research team collected both quantitative and qualitative data over three years to address seven teacher learning goals. This report will first discuss the quantitative and qualitative data for each of those goals, noting significant differences with any or all of the control group school data collected during Year Three (See Reports for Years One and Two for treatment/control group goal data for those years).

## **Teacher Learning Goals and Results for 2009-2010**

Goals for teacher learning were developed by the PAIR/CAPE/Chicago Public School project directors in collaboration with the researchers. The goals have remained consistent through the three years of the project, although they have been reordered and synthesized in order to improve data collection procedures and align instrumentation as the program was implemented and revised each year of the project. It should be noted that the implementation goals are extraordinarily high for this project, with 3 of the 7 goals expecting 90% implementation levels for teachers. This speaks to the investment that the partner arts organization, CAPE, and the district have in the project.

### *Goal 1 Collaboration and Professional Development*

Goal 1 A - 60% of PAIR teachers communicate and collaborate, in and across schools.

Goal 1 B - 90% of PAIR teachers develop partnerships with teaching artists and external professional development resources.

Goal 1C- 50% of PAIR teachers provide professional development for their schools.

### *Goal 2 Curriculum Documentation, Inquiry and Reflection*

2 A – 50% of PAIR teachers develop inquiry questions and demonstrate reflection.

2 B- 90% of teachers develop and document at least one curriculum plan representing arts integration and content learning aligned with Illinois Learning Standards.

2 C 90% of PAIR teachers document implementation and assessment of arts integrative curriculum in the PAIR project.

### *Goal 3 Improved Instruction through Arts Integration*

3 A- 90% of PAIR teachers use and document research-based effective teaching practices in the PAIR unit.

\* \* \*

## Data Collection and Analyses For Year Three

### ***Quantitative Data: Indicators of PAIR's Impact on Participating Teachers***

#### A. Year-End Curriculum and Teaching Survey

- Frequencies for PAIR Teachers were calculated for each item. The Likert Scale for the Year-End Curriculum and Teaching Survey 2009-2010 was as follows:

*1 = never happened*

*2 = rarely happened (one or twice during the unit)*

*3 = happened sometimes (at least 3 times during the unit)*

*4 = happened about often (at least 5 times during the unit)*

*5 = frequently happened (at least 7 times during the unit)*

*6 = always happened (every week during the unit)*

*Occurrences at the level of 3 or higher were counted in frequencies reported for each goal below.*

- Tests for Significant Variation - Treatment and Control Group Teachers (1 of 6 control group schools, Taylor, did not report scores for 2009-2010)
- Tests for Significant Variation - Treatment Teachers and Grade Levels (4,5,6)
- Tests for Significant Variation – Individual Teachers and All PAIR Teachers (4,5,6)

#### B. Professional Development Session Survey (administered 4 times in Year Three)

- Mean scores across 4 sessions by teacher
- Mean scores across 4 sessions by grade level (4,5,6)

#### C. Attendance at Professional Development Sessions (Years One, Two, Three)

- Frequency by teacher

#### D. Effective Teaching Practices Frequency Reported on Student Work Labels

- Identified practices by teacher

### ***Qualitative Data: Indicators of PAIR's Impact on Participating Teachers***

The research team collected a variety of data each year of the PAIR project with the most consistent and thorough collection occurring in Year Three. If there were certain teachers who demonstrated impact, across a variety of variables, then perhaps those teachers' students' outcomes could be explored to see if there is a relationship between impact at the teacher level and student learning. These kinds of relationships are being explored in the larger educational field, particularly with respect to professional development. The PAIR project contributes to this discussion with the results from Year Three. It must be noted that the sample sizes for these tests were always small. The number of possible teachers at each grade level in both treatment and control schools limits the power of the findings.

The qualitative data collected from PAIR teachers are as follows:

- A. *Open-Ended Responses in Year-End Curriculum and Teaching Surveys*
- B. *Student Work Label Effective Teaching Practices*
- C. *Portfolio Conference<sup>1</sup> Comments (from Transcriptions)*

Each transcript was coded and the number of occurrences of these speech categories was counted. Teachers were then grouped according to the number of Occurrences as High, High/Middle, Middle/Low and Low number of Occurrences. The Portfolio Conference Comment by PAIR teachers were coded according to emergent categories of reflection on the meaning of PAIR experiences for themselves and their classrooms (See Table One). These six categories seemed to indicate teacher learning related to specific PAIR Goals. Six teachers did not articulate comments in any of the six emergent categories; it is interesting to note that four of those six are from the same school. Teachers' and school names have been assigned a numerical code to ensure confidentiality. The first number in each code refers to the PAIR treatment school. The summarized data from the portfolio conferences in Tables One and Two below were used to address goals, and the project's impact on specific teachers and will be discussed in Goal sections.

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<sup>1</sup> Portfolio Conferences protocols devised by Dr. Scripp are described and analyzed in detail in Part 3 of this report.

**Table One: Teachers’ Speech Occurrences in Categories During Portfolio Conferences: Relationships to Goal Areas**

<b>Reflective Practice In Portfolio Conference Teacher Comments</b>	<i>Described the impact of PAIR on their non-arts curriculum (Goal 2A)</i>	<i>Described the impact of PAIR on students’ learning in non-arts content (Goal 2C)</i>	<i>Described progress across multiple years in PAIR (Goal 2A)</i>	<i>Described what they would do with PAIR learning after project was over (Goal 2A)</i>	<i>Assessed student learning evidenced in portfolio conferences (Goal 2C)</i>	<i>Described collaborations with other teachers at their school for PAIR project (Goal 1A)</i>
3 or more occurrences during conferences	1.20 3.20 5.10 5.30 5.40	1.40 1.50 3.20 5.10 5.20 5.60	1.10 3.20 5.10 7.10 7.40 11.10	1.10 3.20 5.20 7.30 11.30	1.50 7.10 7.30 7.40 7.60	3.30 9.30 9.40 9.50
2 occurrences	7.10 9.40 11.10 11.20 11.30 11.60	7.30 7.40 9.60 11.10 11.20 11.40				
1 occurrence						

No speech occurrences in these six categories were identified for: 3.10, 3.40, 3.50, 3.60, 7.50, 11.50.

**Table Two: Reflective Practice Portfolio Conference Collective Rankings of PAIR Teachers Based on Number of Occurrences in Categories (See Table One)**

Yellow (High)	Green (High/Mid)	Purple (Mid/Low)	White (Low)
3.20	1.10	1.20	3.10
5.10	1.50	3.30	3.40
7.10	5.20	5.30	3.50
7.30	7.40	5.40	3.60
11.10	11.20	7.60	7.50
11.40	11.30	9.30	11.50
		9.40	
		9.50	
		11.60	

## Goal 1 Collaboration and Professional Development

### Goal 1A - 60% of PAIR teachers communicate and collaborate, in and across schools. MET IN 2008-2009

In a recent review of the literature regarding professional learning communities, researchers noted that there are few studies that move beyond self-reports of positive impact (Vescio, Ross and Adams, 2008). In their review, Vescio et al noted that the collective results of these studies suggest that well-developed learning communities have positive impact on both teaching practice and student achievement. The PAIR project also relies on self-report of teachers and, while the PAIR design did not specifically target the development of formal professional learning communities, the project was from the beginning focused on the variety of collaborations and the ways in which teachers could learn through such structures during the project. As the project progressed, it became clear that PAIR teachers participated in collaborations of several distinct types: 1) collaborations with two partner teaching artists assigned to their schools; 2) collaborations with PAIR teachers on their grade level; 3) collaborations with PAIR teachers on other grade levels; 4) collaborations with PAIR teachers in the partner magnet cluster school (writing, mathematics or language/culture); 5) collaborations with all PAIR teachers and artists in the initiative.

Year Three's Year-End Curriculum and Teaching Survey was redesigned to determine more fully the specific nature of collaboration that the PAIR project engendered among participating teachers. For Goal 1 A, 65.7% reported *discussing the project with teachers from other grade levels* (#6 item on the survey) and 84.4% reported *collaborating with at least one other teacher in the school to extend and deepen the curriculum* (#9 item on the survey). On the basis of these reported frequencies, **Goal 1A was met for Year Three as they are above the 60% level.**

Other data contribute to this discussion of goal implementation as well. Mean scores by grade levels for these two indicators of collaboration reveal more collaboration on the 4<sup>th</sup> grade level than in grades 5 and 6 (See Table Three), though not at the level of significance, with less reported collaboration among the 6<sup>th</sup> grade teachers in the project. This is somewhat predictable as the 6<sup>th</sup> grade teachers joined the project in Year Three, the last year of the project.

**Table Three: Mean Scores by Grade Levels for Items 6 and 9:  
Year-End Curriculum and Teaching Survey**

grade		plan6	curr9
4.00	Mean	4.4444	4.4444
	N	9	9
	Std. Deviation	.88192	1.42400
5.00	Mean	2.8000	4.0000
	N	10	10
	Std. Deviation	1.61933	1.15470
6.00	Mean	3.1000	3.9000
	N	10	10
	Std. Deviation	1.28668	.99443
Total	Mean	3.4138	4.1034
	N	29	29
	Std. Deviation	1.45202	1.17549

grade		plan6	curr9
4.00	Mean	4.4444	4.4444
5.00	Mean	2.8000	4.0000
6.00	Mean	3.1000	3.9000
Total	Mean	3.4138	4.1034

Based on the Year-End Curriculum and Teaching Survey, 2009-2010, there was no significant difference between treatment and control group teachers as groups regarding the *degree of collaboration between classroom teachers*. Neither were there significant differences in the *degree of collaboration between classroom teachers among the matched pairs* of control and treatment schools. This may be due to the magnet school cluster norms of collaboration in both sets of schools.

In the open-ended response section of the Year-End Survey, PAIR teachers were more able to describe the challenges and new conceptions of collaboration that they had gained during the project (See Table Four). The responses reveal some of the central insights with respect to the structure of PAIR and the nature of collaboration over three years with a grade level being added each year.

First, as some indicated, it was the 4th grade teachers who were most intimately involved with the design of the project because they were partners from the first year. Some 5<sup>th</sup> and 6<sup>th</sup> grade teachers perceived themselves as implementing what someone else designed. Also, some 5<sup>th</sup> and 6<sup>th</sup> grade teachers had the impression that the ideas for PAIR work came primarily from the artists. It was probably the case that the artists served as the liaison for teachers across grades and that the PAIR projects were in fact designed by the 4th grade teachers with the artists. Teachers did recognize the

opportunity embedded in the PAIR project for genuine exchange of ideas among teachers. That was a value expressed in writing on this survey as well as in the portfolio conferences.

**Table Four PAIR Teachers and Collaboration:**

**Survey Responses and Portfolio Conference Comments**

This form of instruction is very beneficial for students. It provides them with two different interpretations or styles of teaching. The teachers also grow by learning to accommodate different views. However, the artist seemed pretty set on one idea from the beginning. Further collaboration may have been needed (7.60).

Collaborative teaching is important because it helps teachers prepare lessons with a richer background than if using only their own knowledge. When teachers collaborate, it helps build consistency among classes and grade levels. Also, the exchange of ideas often creates new directions to take on teaching (11.60).

It enables colleagues to share ideas. Sometimes another's idea will trigger additional ideas for others. There was not effective collaboration between the artist and myself. I was not able to clearly present ideas for the project. The artist did come up with ideas (5.30).

Well, it worked out nicely with me because I collaborated with our Spanish teacher. And the different things that we did, we made sure that we were on the same page so that she was there to support us as far as...especially the first unit that we did, the literature unit we did with the story was *Esperanza Rising*, so there were a lot of Hispanic culture and a lot of Spanish words that we were able to use and learn in that way, so it worked out just fine (3.30)

Well, first, summarizing the project, we decided [to share]. This year we took a book, which was *In the Time of the Drums*, and we applied it to the arts and we applied it to writing. And our goals basically was we wanted – since we did it last year, we wanted to see if we could get better at doing it as teachers, Miss G and I, get better at doing it as teachers with our students. So we did some of the same things. Some things we changed. We came up with some new ideas. She did some different things. Miss G did some different things and I did some different things, but we both shared ideas (9.40).

**Goal 1B - 90% of PAIR teachers develop partnerships with teaching artists and external professional development resources. MET IN 2008-2009**

For Goal 1 B, there were a variety of indicators assessed:

81.3% of PAIR teachers reported *brainstorming as part of collaboration and planning with teaching artists (#1 item on the survey);*

94.4% reported *coming to consensus at planning meetings with teaching artists (#2 item on the survey);*



90.7% reported *modeling discussion and feedback with the teaching artists in the classroom when students were present* (with no teachers reporting that this never or rarely happened) (#3 item on the survey);

68.8% reported *planning outside of classroom time* (#4 item on the survey);

50.1% reported *meeting with teaching artists outside of the school* (#5 item on the survey).

78.2% reported that they were actively *integrating the arts when the teaching artist was not there* (#12 item on the survey).

Mean scores for these indicators were also compared across grade levels (See Table Five). Ranges for total means were from 2.7931 (regarding the frequency with which *teachers met with artists outside of school*) to 4.9655 (regarding the frequency with which teachers *modeled discussion and feedback with artists when students were present*). These figures would suggest that teachers felt they did a great deal of co-teaching and were very much involved when the teaching artists were in their classrooms. This phenomenon might suggest that teachers did not feel the need to meet with teachers outside of schools in order to effectively co-teach their PAIR units. Co-teaching represents the most complex and sophisticated measure of collaboration, beyond the instrumental logistics of meetings to plan activities that are typically associated with collaboration and that are investigated in 4 of the 5 items related to Goal 1B.

Qualitative data, including portfolio conference comments indicate that many teachers found ways to communicate with artists that suited them and that, for some teachers, this need to communicate decreased as they became more comfortable with the goals of the project for their own classrooms.

(Tables on next page)

**Table Five: Mean Scores by Grade Levels for Items 1, 2, 3, 4, 5, and 12:  
Year-End Curriculum and Teaching Survey**

grade		plan1	plan2	plan3	plan4	plan5	curr12
4.00	Mean	4.0000	4.6667	4.7778	3.4444	3.6667	4.2222
	N	9	9	9	9	9	9
	Std. Deviation	.86603	1.22474	1.09291	1.01379	.86603	1.56347
5.00	Mean	4.7000	4.8000	5.1000	3.5556	2.7000	4.7000
	N	10	10	10	9	10	10
	Std. Deviation	1.0593	1.39841	.87560	1.23603	1.15950	.94868
6.00	Mean	3.8000	4.7000	5.0000	3.5000	2.1000	4.0000
	N	10	10	10	10	10	9
	Std. Deviation	1.8135	1.70294	1.05409	1.71594	1.72884	1.41421
Total	Mean	4.1724	4.7241	4.9655	3.5000	2.7931	4.3214
	N	29	29	29	28	29	28
	Std. Deviation	1.3381	1.41160	.98135	1.31937	1.42376	1.30678

grade		plan1	plan2	plan3	plan4	plan5	curr12
4.00	Mean	4.0000	4.6667	4.7778	3.4444	3.6667	4.2222
5.00	Mean	4.7000	4.8000	5.1000	3.5556	2.7000	4.7000
6.00	Mean	3.8000	4.7000	5.0000	3.5000	2.1000	4.0000
Total	Mean	4.1724	4.7241	4.9655	3.5000	2.7931	4.3214

Based on the Year-End Curriculum and Teaching Survey, 2009-2010, there were significant differences between treatment and control group teachers as groups regarding the relationships between teachers and teaching artists *brainstorming to plan* ( $t=2.230$ ,  $df=55$ , significance  $<.05 = .030$ ), *coming to consensus in planning* ( $t= 2.74$ ,  $df = 54$ , significance  $<.05 = .008$ ), and *modeling discussion and feedback in front of students in the classroom* ( $t= 3.928$ ,  $df = 55$ , significance  $<.05=.000$ ). These results suggest that the project had considerable, if predictable impact on teachers’ planning processes with external partners.

There were also significant differences among matched pairs of treatment and control group teachers as follows:

Healy/Holden: There were significant differences (with more frequent occurrences reported in the treatment school teachers) in the frequency of *teacher brainstorming to contribute to teacher/artist planning* ( $t=.739$ ,  $df=8$ ,  $significance <.05=.001$ ), the frequency of *coming to consensus during planning meetings between artists and teachers* ( $t=.950$ ,  $df = 7$ ,  $approaching\ significance <.05=.085$ ), and the frequency of *modeling discussion and feedback in front of students in the classroom* ( $t=1.144$ ,  $df = 8$ ,  $significance <.05-.047$ ).

Swift/Ebinger: There were significant differences (with more frequent occurrences reported in the treatment school teachers) in the frequency of *modeling discussion and feedback in front of students in the classroom* ( $t=.839$ ,  $df = 6$ ,  $significance <.05=.024$ ), and the frequency of *meetings with artists outside of school* ( $t=1.769$ ,  $df=6$ ,  $significance <.05 = .005$ ).

Ward/Carson: There were significant differences (with more frequent occurrences reported in the treatment school teachers) in *modeling discussion and feedback in front of students in the classroom* ( $t=8.781$ ,  $df=11$ ,  $significance <.05 = .000$ ), and the frequency of *meetings with artists outside of school, including email, phone or in-person meeting times* ( $t =4.366$ ,  $df=11$ ,  $significance <.05 = .044$ ,  $t= 3.813$ ,  $df=11$ ,  $significance <.05 = .001$ ).

The most interesting thing about these comparative data between the PAIR schools and the control group schools is that three of the six PAIR schools showed significant differences with respect to what happens in their classrooms while working with teaching artists. Healy, Ward and Swift teachers all indicated co-teaching behaviors: this suggests something about the nature of their classrooms in this initiative that moved beyond the traditional “one teacher at a time” model.

Based on these data, **GOAL 1B WAS MET FOR 2009-2010.**

**Goal 1C- 50% of PAIR teachers provide professional development for their schools.**

NOT MET IN 2008-2009

Based on the Year-End Curriculum and Teaching Survey, 2009-2010, there was no significant difference between treatment and control group teachers as groups regarding the degree to which

teachers report receiving feedback either from teachers in their own schools or in other schools regarding their curricular units.

This year’s Year-End Curriculum and Teaching Survey also asked teachers whether they had *shared their PAIR units with other teachers in their own school* (item # 15 on the survey and 65.7% reported they did) and *with teachers outside of their school* (item # 16 on the survey and 37.5% reported they did).

Mean scores are again reported by grade levels for these indicators (See Table Six). The averaged mean scores across three grade levels for these two indicators of project dissemination were 3.3793 (item #15) and 2.4138 (Item #16), indicating that such sharing had happened *sometimes (at least 3 times during the arts integration unit) or rarely (once or twice during the arts integration unit)*. There were no significant differences across the grade levels in this regard; 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> grade teachers alike reported that this dissemination did not happen often.

**Table Six: Mean Scores by Grade Levels for Items 15, 16: Year-End Curriculum and Teaching Survey**

Grade		share15	share16
4.00	Mean	3.8889	2.8889
	N	9	9
	Std. Deviation	1.45297	1.26930
5.00	Mean	3.1000	2.0000
	N	10	10
	Std. Deviation	1.66333	.81650
6.00	Mean	3.2000	2.4000
	N	10	10
	Std. Deviation	1.31656	1.07497
Total	Mean	3.3793	2.4138
	N	29	29
	Std. Deviation	1.47391	1.08619

grade		share15	share16
4.00	Mean	3.8889	2.8889
5.00	Mean	3.1000	2.0000
6.00	Mean	3.2000	2.4000
Total	Mean	3.3793	2.4138

The Project Directors felt that PAIR was not structured to provide the necessary support for teachers to formally “provide professional development for their schools” as Goal 1C states. This may be a useful follow up to the PAIR project during 2010-2011. It should also be noted that the PAIR Project Directors from CAPE and the Magnet School Cluster Administration will offer a project dissemination day in November of 2010 during which the PAIR projects will be shared.

Based on these data and acknowledging the opportunity for teachers to share their work as a culminating event in November, **GOAL 1 C has been met in 2009-2010.**

## **Goal 2 Curriculum Documentation, Inquiry and Reflection**

### **2A – 50% of PAIR teachers develop inquiry questions and demonstrate reflection.**

MET IN 2008-2009

Based on the Year-End Curriculum and Teaching Survey, 2009-2010, there were no significant differences between treatment and control group teachers as groups regarding the degree to which *teachers report innovating approaches or processes in their own teaching (#10) or the development of inquiry questions to guide the curriculum (#11).*

Similarly, there were no significant differences in the treatment and control group teachers as groups with respect to *reporting their success at predicting the quality of student work over time (#20)*, except in the case of the matched pair of Healy and Holden, in which *Healy teachers did report increasing success at predicting quality as the project continued ( $t=.688$ ,  $df=8$ , significance =  $<.05=.018$ ).* There were no significant differences in the treatment and control group teachers as groups with respect to the *degree to which they reported reflecting on their teaching (#24).*

On the Year-End Curriculum and Teaching Survey, PAIR teachers reported occurrences as follows:

87.5% reported *thinking of innovative arts integration approaches within their content areas;*

75.1% reported *developing inquiry questions to explore the PAIR curriculum;*

84.5% reported *becoming more successful at predicting the quality of student work during the PAIR unit;*

87.6% reported *reflecting on their practice during the PAIR unit;*

78.1% reported *participating as a student and learning while the teaching artist was in the classroom.*

**Table Seven: Means Scores by Grade Levels**  
**Items 10, 11, 20, 24, 40 - Year -End Curriculum Survey**

Grade		curr10	curr11	doc20	doc24	art40
4.00	Mean	4.4444	3.7778	4.4444	4.4444	4.3333
	N	9	9	9	9	9
	Std. Deviation	1.42400	1.30171	1.33333	1.33333	1.87083
5.00	Mean	4.5000	4.1111	4.1000	4.8000	4.1000
	N	10	9	10	10	10
	Std. Deviation	1.17851	1.36423	.56765	.63246	1.44914
6.00	Mean	4.1000	3.4000	4.5000	5.1000	4.9000
	N	10	10	10	10	10
	Std. Deviation	1.28668	.96609	1.50923	1.10050	1.19722
Total	Mean	4.3448	3.7500	4.3448	4.7931	4.4483
	N	29	28	29	29	29
	Std. Deviation	1.26140	1.20570	1.17339	1.04810	1.50205

Grade		curr10	curr11	doc20	doc24	art40
4.00	Mean	4.4444	3.7778	4.4444	4.4444	4.3333
5.00	Mean	4.5000	4.1111	4.1000	4.8000	4.1000
6.00	Mean	4.1000	3.4000	4.5000	5.1000	4.9000
Total	Mean	4.3448	3.7500	4.3448	4.7931	4.4483

One element of investigation with respect to teacher learning related to practice is the importance of reflection and learning from mistakes, missteps, and discomfort with new ways of teaching. Much of CAPE’s work is founded on the principle of risk-taking and questioning that is necessary if one is to move beyond current practice. Projects such as PAIR allow researchers to follow that process of what Lee Shulman calls “error, success and refinement or – in a word, teacher-knowledge growth” (1987, p. 4) for those teachers who choose to seize the innovation. As Shulman says, “The neophyte’s stumble is the scholar’s window” (p. 4). What can the research team learn then from the teachers’ reflections on PAIR?

Reflection is a difficult aptitude to measure and sometimes may be a challenge to recognize. Table One exhibits teachers' rankings in six basic categories of reflection, based solely on their transcribed comments related to the categories of teacher impact identified by the researchers in the Portfolio Conferences. Table Two exhibits the overall rankings as High Number of Occurrences, High/Middle Level of Occurrences, Middle/Low Level of Occurrences, and Low Level of Occurrences. These comments address several goals for teachers in the PAIR project including the goal to encourage reflection about their teaching and about what the PAIR project might do to enhance their teaching. Teachers in Year One had to rethink their assumptions about such projects with external partners that are focused on classroom time with students. They had to adjust to the notion that the research team was also interested in teachers' learning, not just the impact that the project has on students.

Now, at the end of the project, teachers, such as the "neophytes" to arts integration referenced below, can articulate what they have learned:

*Rather than look for their simple grammatical errors and sentence structures and development of the story, I kind of put that to the side now—and I don't look at their mistakes in spelling. I look at the ideas and things developed and the process that they took in writing their stories. That's a big difference (11.10).*

*I was able to trace students' thoughts, their difficulties and then plan to go about this work. This helps me to know if they are going in the right direction. Are they learning the strategies and skills? I am able to understand the process students are planning at this level of involvement (5.60).*

*This (PAIR project) gave me lots more ideas. Go beyond the concept (3.20).*

This year, in the portfolio conferences, 7 teachers reported the adoption of inquiry questions in their PAIR units. In addition, teachers demonstrated reflective practice in the coded categories of the conferences. Coded comments revealed categories of 'reflective practice' that the research team then explored with other qualitative variables to discern whether certain teachers had more characteristics that could indicate PAIR impact on practice. While these categories do not suggest a definitive ranking of teachers as "Highly reflective" or "Not reflective" by any means, they suggest a way of considering what teachers said during the portfolio conferences about PAIR and the impact it has had on their teaching and their students. It must also be noted that the Conferences, which followed a protocol, were not strictly scripted and the conversations did have some appropriate variability across

the teachers and their students in the 6 treatment schools. In addition, 6<sup>th</sup> grade teachers in their first year of the project were understandably less able to discuss their progress during the PAIR project over time due to the design of graduated implementation across grade levels.

**Based on these qualitative and quantitative data, GOAL 2 A WAS MET for 2009-2010.**

**2B- 90% of teachers develop and document at least one curriculum plan representing arts integration and content learning aligned with Illinois Learning Standards. MET IN 2008-2009**

Curriculum development is discussed in the professional development research literature as a central aspect of teacher learning and growth (Gordon, 2004; King & Lawler, 2003). When teachers analyze student work, they can begin to “see” how students are thinking and reflect on implications for their teaching practices from that standpoint (Fickel, 2002). Similarly, teachers can learn much from shared lesson and curriculum planning in a common grade level or for a common unit, as the PAIR project suggests.

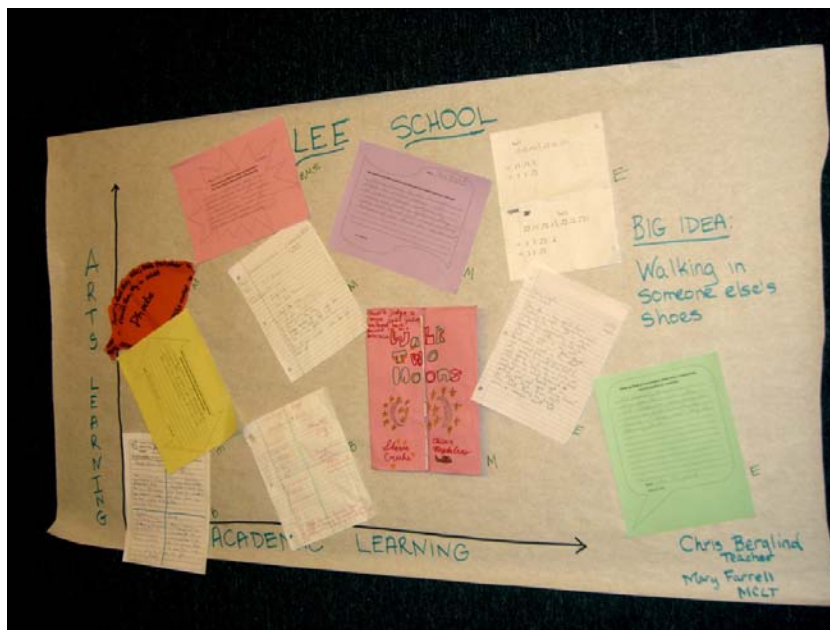
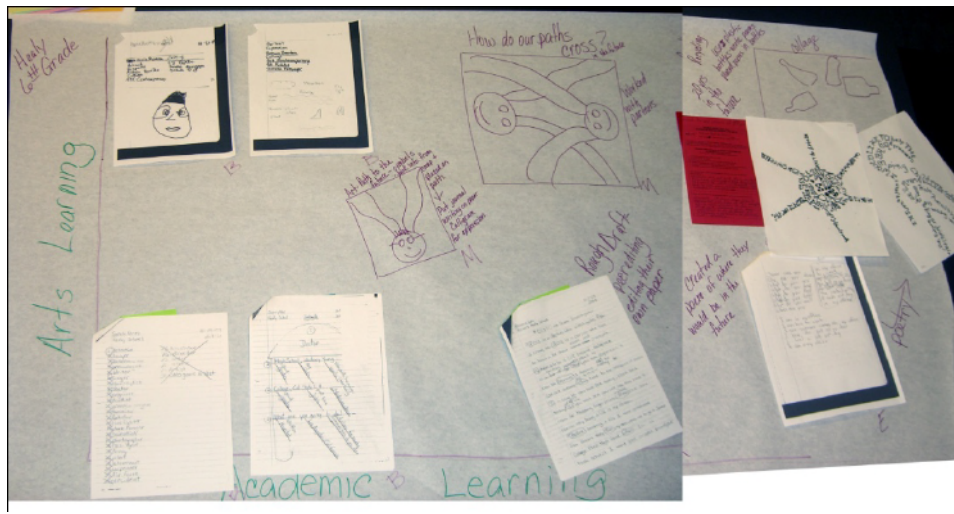
Arts teachers and teaching artists, however, are seldom expected to develop long-term, high quality arts curriculum that is relevant, related to non-arts learning, and open to ongoing collaboration and dialogue as replicated over time, nor are they accustomed to seeing exhibitions and performances of ‘student work’ as tools for pedagogical or curricular improvement. Especially in funded projects, there are few useful curriculum unit plans available for replication in the field. Further, most “written” curriculum guides in schools are not actively used and referred to by teachers. There are few curriculum guides available for dissemination that reflect collaboration explicitly. Finally, most curriculum plans developed by teachers have few or no examples of student work to demonstrate rich learning formatively or summatively.

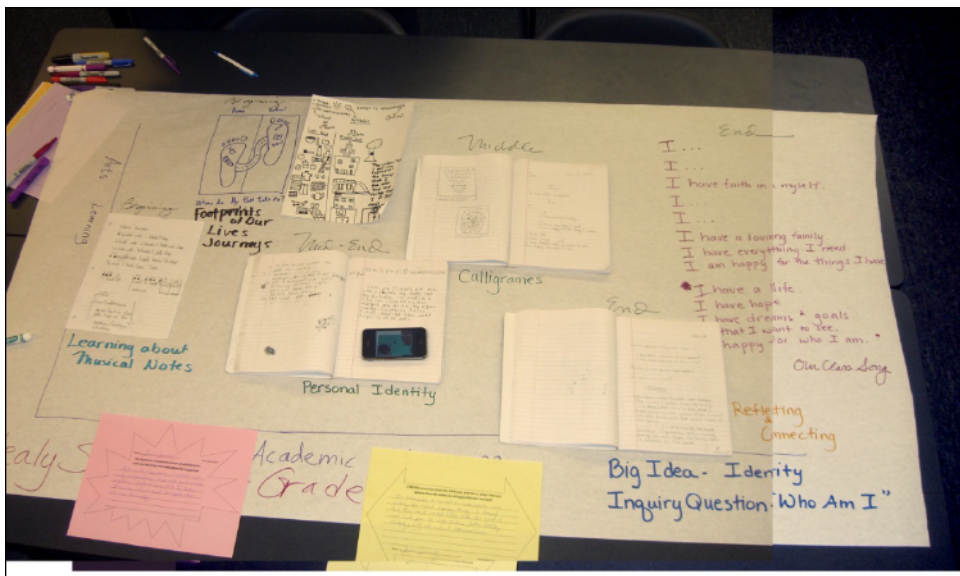
The challenge then in PAIR was formidable. The PAIR units developed in Year One did appear to remain fairly consistent during Years Two and Three. The professional development offered to teachers and artists in Year One was in part aimed to help teachers learn to document those curriculum units more fully in order to improve them, learn from them, and share them with the larger magnet cluster group of schools in the district. The teams in the schools increased the level of their documentation of the units over the three years and, in Year Three, many seemed to understand the value of such a practice. As in the BCCLA project two years earlier, the notion of curriculum planning,



while a required compliance element for teachers, is not considered a crucial part of teacher practice, even for the most effective teachers. The PAIR/CAPE leadership for professional development determined that curriculum maps that incorporated the activities of both teaching artists and the grade level teams of teachers was the most effect way of documenting the curriculum plans. These maps were used as tools to guide the initiative and were informally created during professional development sessions in Years One and Two. In Year Three, the maps, coupled with documentation panels, were designed to show the Arts and Academic Learning Outcomes embedded in the PAIR activities (See Figures A, B, C).

**Figures A, B, C: Curriculum Maps from PAIR Professional Development Sessions**





Based on the Year-End Curriculum and Teaching Survey, 2009-2010, there were areas in which the teachers indicated that the arts integration initiatives in PAIR contributed to students' understandings in the focal non arts content areas. Part of the curriculum mapping/unit process was to determine the intersections in students' learning areas among art forms and the non-arts content that was the focus of the magnet cluster partner PAIR schools.

In the mathematics magnet cluster school matched pair, Swift and Ebinger, there were significant differences regarding *reported implementation of movement/dance to help students understand mathematics*, with more frequent occurrences reported in the treatment school teachers. ( $t=1.899$ ,  $df=6$ ,  $significance = <.05 = .035$ ). Swift worked with a dance/movement artist as well as a sculptor/visual artist; the trend toward understanding through movement and dance is therefore encouraging in the treatment school.

In both PAIR mathematics magnet cluster schools, Swift and Thorp, there were significant differences with their matched control group magnet cluster schools with respect to the degree of implementation of the use of music to help students understand math concepts or math problems (*Swift/Ebinger:  $t = 1.604$ ,  $df=6$ ,  $significance = <.05=.048$ , Thorp/Hale:  $t= 1.332$ ,  $df=10$ ,  $significance = <.05=.021$* ). While this might initially seem surprising given that the artists working with Swift and Thorp over the three years were not music teaching artists, music was an integral part of the movement/dance initiatives on the part of one of the teaching artists. Some of the teachers continued to express discomfort with the dance and movement from a personal experience standpoint, but it's possible that

the introduction of music to their classrooms was both beneficial and less risky than the movement itself.

Based on the Year-End Curriculum and Teaching Survey, 2009-2010, there was approaching significant difference in the language arts/writing magnet cluster school matched pair, Eberhart and Pirie, with respect to *reported implementation of one particular art form – images/visual art – to help students understand books, stories, writing or vocabulary* ( $t=1.852$ ,  $df=7$ , *approaching significance* =  $<.05=.074$ ). Again this trend is intriguing in that the teaching artists at Eberhart were not visual artists but rather focused on music and drama integration with writing. Based on the documentation in the PAIR Pails, the teachers did use more visual imagery, graphic organizers, and visual symbols more frequently with these art forms to help students relate their writing to the art forms, thereby building upon the artists' contributions to the curriculum.

This area was also a significant difference for another matched pair in the language and culture magnet cluster schools, Healy and Holden, in which the Healy teachers *reported more use of images/visual arts to help students understand books, stories, writing or vocabulary* ( $t=1.352$ ,  $df=8$ , *significance* =  $<.05=.000$ ). This might suggest that even though the emphasis content area for Healy in the PAIR project was culture, the clear integration with writing, language, and cross-cultural communication through the arts was evident to the teachers.

**2C 90% of PAIR teachers document implementation and assessment of arts integrative curriculum in the PAIR project.** Formerly Goal 3A NOT MET IN 2008-2009

Consistent with what has been reported for the Goals above, there is much richer documentation and more data sources to address this goal in 2009-2010 than in the previous two years of the project. First, on the Survey, PAIR teachers reported as follows:

84.4% reported that they and/or their students were documenting and assessing during the PAIR unit;

68.8% reported that they used pre and post assessments to see what students were learning through arts integration.

Based on the Year-End Curriculum and Teaching Survey, 2009-2010, there were no significant differences between treatment and control group teachers as groups regarding *the degree to which*

students documented and assessed their own learning (#25 item on the survey), nor were there significant differences in the degree to which teachers used pre and post assessments to ascertain student learning (#26 item on the survey).

There was a significance difference in one matched pair, Healy and Holden, with respect to the degree to which students documented and assessed their own learning, in which Healy teachers reported that students documented and assessed their learning more often ( $t=.717$ ,  $df=8$ ,  $significance = <.05=.013$ ).

Grade level means were compared for these two items on the Year-End Curriculum and Teaching Survey (See Table Eight). Across the grade levels, it seemed that teachers reported more student involvement in documenting and assessing than in the teachers using pre/post assessments for the PAIR project. Although pre/post assessment was featured in professional development sessions for this project, it became apparent that teachers rarely used pre/post measures in their teaching, nor did they see that approach as meaningful for an arts integration project such as PAIR. Teachers reported assessing informally, through observation, or through the actual projects that students produced, in order to determine whether PAIR had been effective. If specific pre/post measures are important for future projects, it would be necessary to work with teachers to discover how to design and use them as part of their teaching practice.

**Table Eight: Grade Level Means for Items 25 and 26: Year-End Curriculum and Teaching Survey**

grade		doc25	doc26
4.00	Mean	4.2222	3.6667
	N	9	9
	Std. Deviation	1.39443	1.50000
5.00	Mean	4.6000	3.9000
	N	10	10
	Std. Deviation	1.26491	1.28668
6.00	Mean	4.6000	3.6000
	N	10	10
	Std. Deviation	1.26491	1.83787
Total	Mean	4.4828	3.7241
	N	29	29
	Std. Deviation	1.27113	1.50941

This goal addresses teachers' perception of how much their students learned through the PAIR project. Even though they did not offer too many specific assessment instruments or rubrics associated with the project, although encouraged to do so in the PAIR PAILS, they definitely had anecdotal views on how the project had affected their students' learning in their comments during the Portfolio Conferences (See Table Nine). The Magnet Cluster Schools might draw on these experiences to develop more tangible ways for teachers to provide evidence of their sense that students did learn specific skills and concepts as they attest to in these comments from this arts integration initiative in a non-arts content area.

### **Table Nine: Impact of PAIR on Students' Learning**

#### **Teacher Comments from Portfolio Conferences**

Just their overall taking a test, and their writing has really improved. Some of their Young Author stories, I see, reading through them, they really came up with three problems that a character came across in their narrative stories. (11.40)

And I find that it appeals to different intelligences. They actually get up, get out of their seats. They get around and move. It's not just visual and listening skills. I think a lot of students, in this class especially, are kinesthetic. They need to get up and move and do things with their hands. I think it helped them to develop a better understanding of the material. As we read, we tried to connect to a novel in reading. I think all the students were engaged. I think they were very excited about learning. It was kind of fun to be in the classroom. And I think it...I'm *hoping* it helped develop higher level thinking skills (11.40).

I think it bring a lot of creativities in my classroom and it really gives them a lot more vocabulary that they don't use daily. It kind of like gave them another way to express themselves and to learn in a different way other than the way that we teach traditionally, you know, through papers and through the board (3.20).

I would...I see that now, when we're writing and we do writer's workshop almost every day, and their characters are better defined, there is more detail about their characters. We're learning...I really think I've seen a progression, and even for the time that, you know, what I had in their portfolios and now, months later, it's a better awareness of how you write a story, that there has to be a story. You just can't write then, then, then, then, then, that there's characters in their stories – and this goes for my whole class, not just these three students – that they're really getting the idea of how to put a story together. But what I see is each piece gets better and better. (11.20).

The Portfolio Conference afforded teachers the opportunity to view the “HAL” students in the project (that is, the High Achieving, Average Achieving and Low Achieving students) as they interacted with the researcher regarding their work in the PAIR project. The interviewer then asked them to comment on what they saw, with particular attention to how and whether these categories of achievement (as

measured on Reading ISAT scores) were evident in this particular approach to assessment (See Table Ten). For some teachers, it was clear that they viewed the conference as a unique form of assessment that was distinctly different from more traditional forms of assessment.

**Table Ten: HAL Students and Assessing Learning  
Teacher Comments During Portfolio Conferences**

<p>The fact that they understood the story so well. You know, I assess them by giving them a little matching vocabulary test that they really got the true meaning of all these different complexities in the story that we read. They really got the meanings of the stories. (11.40)</p> <p>Well, I mean, like I said, the fractions. I mean, I don't know if I'm saying what you want me, like, but, like they understand the fractions. I know that. I mean, I can tell that from what they said that for the most part they understand the parts of a whole. They understand the sides of shapes (5.10)</p> <p>.....</p> <p><b>(Interviewer):</b> But what was it that they said that convinced you?</p> <p><b>Teacher:</b> Well, they were able to identify a third, a sixth, a half. They were able to identify that that's a hexagon because it has six sides. From what we saw them do, I think they understand symmetrical and asymmetrical (5.10).</p> <p>.....</p> <p>Now that they're not here, I can speak freely about their growth and development. They're language learners, English Language Learners, so during this year I didn't see, or didn't get the growth in the writing as I expected to see in my previous classes, especially the first year with the project in a mono English classroom. This year they were still developing the writing skills. It's the last step that they develop as bilingual students. However, their confidence and ability to speak to others using the English language has grown significantly, and I think it's because of the fact that they can express their knowledge through other means rather than the simple paper and pencil. Because paper and pencil basically means they're going to be graded as far as what they write and how they spell things. But when they have the opportunity to say it to you, they know that they can express their ideas, what they know and what they've learned, a whole lot more freely than they can on paper and pencil (11.10).</p> <p>.....</p> <p><b>(Interviewer):</b> You think people watching the tape would know that they're low, medium and high?</p> <p>I don't think so. That's why I'm very glad, because all three were answering, all three had something to say, and it wasn't intense. They were really putting things together and everything else. And I don't think...this is part of the program where I see that they're integrated, and you can't really tell the difference (7.10).</p> <p>.....</p> <p>I don't think if you just looked at them you could say like, oh, well, this one really struggles with math and this one – I mean, I don't think you can really tell across the projects. (5.40).</p>
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These teachers were able to assess understanding differently in the conference context and thereby viewed the HAL students' capacities in new ways.

In summary, even though the goal regarding documentation and assessment was not met at the high frequency level of implementation projected (90% of teachers), the amount of documentation has increased steadily each year of the three-year project and this year's work contributed to a richer portrait of the work on the part of students and teachers. The portfolio conference process is promising as a systemic part of integration initiatives in the future. The conference depends on documentation and could influence what teachers collect from students and how they interact with students themselves in teacher or artist-led conferences.

Experience with other CAPE projects suggests that authentic documentation procedures that are useful for assessment and contribute to curriculum improvement take time and skill to develop. There were teachers in the project who excelled at documenting and collected data that appeared to be beneficial for their own practice and not merely for the purposes of the project team (See "Documenting to Learn Effect" below). Such efforts should be highlighted and further research conducted on how/whether documenting to learn can be scaled up in schools and partnerships such that it impacts teacher practice and student achievement.

**Based on these data, GOAL 2 C WAS NOT MET FOR 2009-2010.**

### **Goal 3 Improved Instruction through Arts Integration**

**3A- 90% of PAIR teachers use and document research-based effective teaching practices in the PAIR unit.** Formerly 2C NOT MET IN 2008-2009

There were three items (# 21, 22, 23) on the Year-End Curriculum and Teaching Survey that addressed Goal 3 A in addition to other data sources collected this year.

On the survey PAIR teachers reported as follows:

78.2% reported that they make use of their students' feedback to co-create curriculum;

84.4% reported that they conduct critique sessions during the PAIR units.

90.7% reported that they look at student work in order to revise their curriculum.

These elements were essential components of the CAPE/PAIR methodology and were consistent sources of discussion in planning meetings and professional development meetings. It is reassuring to see the progress on these indicators from Year Two to Year Three. The mean scores on these items are consistently high on these three items across grade levels, indicating that teachers did feel an investment in working on their curriculum from the perspective of what students were actually learning, articulating and producing (See Table Eleven). That was a major goal for PAIR this year.

**Table Eleven: Grade Level Means for Items 21, 22, 23:  
Year-End Curriculum Survey**

Grade		doc21	doc22	doc23
4.00	Mean	4.2222	4.2222	4.0000
	N	9	9	9
	Std. Deviation	1.30171	1.39443	.86603
5.00	Mean	4.0000	4.4000	4.6000
	N	10	10	10
	Std. Deviation	1.24722	.96609	.84327
6.00	Mean	3.9000	4.2000	4.8000
	N	10	10	10
	Std. Deviation	1.28668	1.31656	1.13529
Total	Mean	4.0345	4.2759	4.4828
	N	29	29	29
	Std. Deviation	1.23874	1.19213	.98636

grade		doc21	doc22	doc23
4.00	Mean	4.2222	4.2222	4.0000
5.00	Mean	4.0000	4.4000	4.6000
6.00	Mean	3.9000	4.2000	4.8000
Total	Mean	4.0345	4.2759	4.4828

Based on the Year-End Curriculum and Teaching Survey 2009-2010, there were no significant differences between treatment and control group teachers as groups regarding the *degree to which students co-created of curriculum or participated in critique sessions*. Teachers in both groups did not report significant differences in *the degree to which they used student work to analyze and revise their curriculum*. Neither were there significant differences *between classroom teachers among the matched pairs* of control and treatment schools in these areas (See Table Eleven).

PAIR teachers submitted student work for the PAIR project and attached student work labels to describe the teaching practices associated with that work. The labels offered a practices menu for the teachers derived from the Effective Teaching Practices Survey that CAPE has been adapting for



different projects for the past 7 years. The Practices are based on the standards from the Center for Research on Excellence and Diversity in Education ([www.crede.org](http://www.crede.org)). Project resources did not permit direct, regular and systematic observation of all teachers in the project. However, the research team did collect student work and teachers' Effective Teaching labels on that work in which they described the teaching and learning processes through which that work was produced.

The research team coded the labels to determine which teachers made use of the opportunity to reflect on their practice during PAIR and the subsequent student work that emerged. A few teachers submitted no labels. Many teachers identified very similar teaching practices that they employed during the PAIR unit. However, there were seven areas that seemed to distinguish teachers' practice as self-reported on the student work labels were:

1. *Assessments of any kind used during PAIR (including exhibitions, performances, tests, conferences, writing samples).*
2. *Documentation of students' co-creation of curriculum (including planning, brainstorming, developing new ideas, making choices, working together, improvising).*
3. *Documentation of students teaching other students.*
4. *Documentation of students teaching the teacher.*
5. *Student participation in documenting and assessing during PAIR (including critique, naming learning strategies they were using)*
6. *Students writing their own inquiry questions to guide PAIR work.*
7. *Students using new arts vocabulary.*

Table Twelve illustrates the results from the student work labels by teacher. Half (50%) of the teachers in the project reported that *students taught other students* in the PAIR project. This practice is one of the research-based Effective Teaching Practices derived from the CREDE standards and a goal practice for arts integration initiatives through CAPE. Twenty-eight percent reported the *documentation of assessment* and *the co-creation of curriculum with students*. Twenty-two percent of responding teachers reported *students' participation in documentation and/or assessment, writing inquiry questions*, and *using new arts vocabulary on the student work labels*. The most unusual Effective Teaching practice from the label menus, *students taught the teacher* was noted by 2 of the 32 teachers.

**Table Twelve: Effective Teaching Practices Documented on PAIR Student Work Labels**

<b>Evidence of PAIR Teacher Impact based on Student Work Labels</b>	<b>Documented assessment</b>	<b>Documented students' co-creation of curriculum</b>	<b>Documented students teaching other students</b>	<b>Documented students teaching the teacher</b>	<b>Students participated in documentation and/or assessment</b>	<b>Students wrote inquiry questions</b>	<b>Students used new arts vocabulary</b>
	1.50	1.20	1.20	11.20	1.10	3.30	1.40
	3.10	1.50	1.40	11.40	1.20	5.20	3.20
	3.20	3.10	1.50		1.50	5.40	7.10
	3.50	3.20	3.10		3.10	5.60	9.30
	5.20	3.30	3.50		3.50	9.50	9.50
	7.10	3.40	3.60		5.20	11.20	11.20
	7.30	3.50	5.20		5.40	11.40	11.40
	7.50	3.60	5.60		5.60		11.60
	9.40	5.10	7.10		7.10		
	9.50	5.20	7.30		7.30		
	11.20	5.30	7.50		7.50		
	11.30	5.40	7.60		9.30		
	11.40	5.60	9.40		9.50		
		7.10	11.20		11.40		
		7.30	11.30				
		7.40	11.40				
		7.50					
		7.60					
		9.30					
		9.40					
		9.50					
		11.20					
		11.30					
		11.40					
		11.60					

In addition, categorized comments by teachers in the portfolio conferences represent triangulated data that suggest the project's impact over time on their practice as mathematics, world language and writing teachers (See Table Thirteen). The teachers who articulated their growth and understanding over time during PAIR are understandably 4<sup>th</sup> or 5<sup>th</sup> grade teachers, due to the design of the program.

### Table Thirteen: Teacher Progress and Learning Over Time in PAIR Project

#### Portfolio Conference Comments

I think that the teaching artists also learned the curriculum more and they kind of know, “Oh, you guys do this, don’t you, here,” and we kind of, you know, that was really helpful. And, you know, I just think like with anything, the longer you know someone, you just kind of...everything runs smoother (5.10)

Well, the original goal was to see how the arts itself affected the students’ abilities as far as their writing, and how the different arts, for example, music, because we had a percussionist and a playwright, would enhance the child’s development of characters and stories. The first year was pretty new. We still had to develop some skills as far as what the artists were teaching the children and my own understanding of what it was. This year I think it's been...I've seen...to get the kids to actually think more critically. Last year it was okay, okay, it's going through the machinations, for the most part. This is what I'm supposed to do, this is what we did (11.10).

Well, I think these students are much better at relating it to math than last year. I think they were much more...they expressed themselves much better mathematically, which is because when I was in the room, we really stressed this is not only art. I mean, we talked about it before, but we really stressed it this time because I didn’t want it to happen again where they didn’t see the value of the math in the project (7.30).

Based on these multiple data sets, **Goal 3A was met in 2009-2010.**

#### ***Variability Between Partner PAIR Schools***

PAIR schools were paired according to magnet cluster school focus:

Thorp and Swift – Mathematics

Eberhart and Lee – Writing

Healy and Ward – World Language

Based on the Year-End Curriculum Survey, there were no significant differences in the Thorp and Swift teachers’ implementation within the goal areas. In other words, the teachers at these two schools who engaged with teaching artists in the teaching of mathematics perceived the project similarly in terms of the nature of *collaboration*, the *extending and deepening of the curriculum*, their *sharing with peers* at their schools, *documentation and learning through the arts forms* offered by the two teaching artists.

There were a slight difference in the Eberhart/Lee pairing for 2009-2010 with Eberhart teachers reporting more success at *predicting the quality of student work* from the PAIR unit over time ( $t=2.279$ ,

$df=15$ ,  $significance = <.05=.015$ ). This is encouraging and seems to suggest, if in only one small way, that Eberhart teachers were understanding the project more fully and what it could mean for their students as they examined arts integrated student work samples to enhance student learning.

Healy and Ward demonstrated several areas of significant difference: Healy teachers reported more *collaboration* at their school: ( $t=1.143$ ,  $df = 20$ ,  $significance = <.05=.049$ ). Healy teachers reported more *innovation in arts integration* in their classrooms: ( $t=1.491$ ,  $df = 20$ ,  $significance = <.05=.011$ ). Healy teachers reported more *feedback on units among peers at their school*: ( $t=1.674$ ,  $df=20$ ,  $significance <.05=.012$ ) (See “The Healy Effect” below).

### **Summary of Teacher Goals**

PAIR teachers increased in the level of implementation for all seven goals in the project during Year Three. The summary, with comparisons between Year Two and Year Three, based on quantitative and qualitative data, appears in Table Thirteen. Three goals were not met in 2008-2009 and only one goal was not met in 2009-2010.

These goals were assessed with respect to teachers’ self-reported responses on targeted items on the Year-End Curriculum Survey for Year Three of the project and results were also compared to paired control group teachers in each goal area. Grade level means were also reported.

During Year Three, the research team isolated the specific indicator related to documentation of Effective Teaching Practices, formerly included in Goal 2C as part of documentation in general and made it a separate goal, 3 A, for Year Three. During Year Three of the project, the level of documentation, including PAIR PAIL student labels and curriculum maps, coupled with the complete set of portfolio conferences that included each PAIR teacher, provided increased evidence of implementation of all goals above from qualitative sources.

The one goal not met in 2009-2010 was set at a 90% implementation level that, in hindsight, was difficult to achieve with limited designated resources focused on technical assistance for documentation and intensive professional development in assessment practices in this project. The district might consider ways in which to advance more research-based authentic assessments that

address the curricular designs of integration while accommodating content area learning in the Magnet Cluster Schools.

**Table Fourteen: Teacher Goal Outcomes Based on Quantitative and Qualitative Data**

	2008- 2009	2009-2010
<b>Goal 1 Collaboration and Professional Development</b>		
Goal 1 A - 60% of PAIR teachers communicate and collaborate, in and across schools.	<b>Met</b>	<b>Met</b>
Goal 1 B - 90% of PAIR teachers develop partnerships with teaching artists and external professional development resources.	<b>Met</b>	<b>Met</b>
Goal 1C- 50% of PAIR teachers provide professional development for their schools.	<b>Not Met (50% level)</b>	<b>Met (Pending November Dissemination Session)</b>
<b>Goal 2 Curriculum Documentation, Inquiry and Reflection</b>		
2 A – 50% of PAIR teachers develop inquiry questions and demonstrate reflection.	<b>Met</b>	<b>Met</b>
2 B- 90% of teachers develop and document at least one curriculum plan representing arts integration and content learning aligned with Illinois Learning Standards.	<b>Met</b>	<b>Met</b>
2 C 90% of PAIR teachers document implementation and assessment of arts integrative curriculum in the PAIR project.	<b>Not Met (80% level)</b>	<b>Not Met (90% level)</b>
<b>Goal 3 Improved Instruction through Arts Integration</b>		
3 A- 90% of PAIR teachers use and document research-based effective teaching practices in the PAIR unit	<b>Not Met (80% level)</b>	<b>Met</b>

### **Professional Development and PAIR**

Over the past 25 years, professional development for teachers has gone from a choice to a mandate (Lieberman and Wilkins, 2006). Further, professional development is increasingly cited as a key mechanism for improving schools (Lieberman and Wilkins, 2006; Frechtling and Killeen, 2003; Elmore, 2002; Newmann, King and Youngs, 2000). This means that districts must learn from small-

scale projects such as PAIR in order to scale up professional development that is meaningful for a larger set of schools with common characteristics.

There are many models for professional development in educational literature that share common features, including grade level, content, or team professional development coupled with individual experiences, focus on content, attention to inquiry and analyzing student work. The emphasis on content has been a central feature of professional development research for decades (Grossman, Schoenfeld with Lee, 2005, Invarson, Meiers and Beavis, 2005; Guskey, 1985; Joyce and Showers, 1982). A focus on content and reported impact on practice is clearly evident in this research. PAIR's design to intentionally focus on mathematics in two schools, culture and language in two schools, and writing in two schools addresses this criterion clearly. The results of this research indicate that content expertise is a variable in the discussion of the degree to which teachers implement an innovation in arts integration with external partners.

Data collection with respect to professional development focused on artifacts constructed during the sessions the Professional Development Session Surveys completed for each session, and attendance data (See Maps in Goal 2B above, Session Discussions in Tables Fifteen and Sixteen and Documentation Panels in Figure D, E, F below). The four sections of the Professional Development Session Survey correspond to Teacher Goals (see above sections) and are parallel with sections of the Year-End Curriculum Survey. Means for items in the four sections of the Session Survey (*Collaboration and Planning*, *Peer to Peer Sharing* and *Extending/Deepening the Curriculum*, and *Documentation of Student Learning*) are reported below, with sample documentation as they were collected during the professional development sessions.

The Professional Development Session Survey's scale was based on the research by Hall and Hord (2006) regarding the measurement of the *level of use* of an innovation (See Table Fifteen). The Survey is compelling in that it asks teachers to not only comment on the experiences in the professional development session, but also asks them, in the same Likert scale, to assess the degree to which the indicator is happening in their own setting and context. In other words, the teachers were asked to comment on the degree to which the professional development goals and the actual teaching occurring are parallel. Current research in this area is very much focused on how to assess the connections between what teachers experience in professional development and what they are doing in their classrooms.

**Table Fifteen: Level of Use of An Innovation (Hall and Hord, 2006)**

*(How do we know when an innovation has taken hold?)*

Users
<ul style="list-style-type: none"><li>• Renewal</li><li>• Integration</li><li>• Refinement</li><li>• Routine</li><li>• Mechanical Use</li></ul>
Nonusers
<ul style="list-style-type: none"><li>• Preparation</li><li>• Orientation</li><li>• Nonuse</li></ul>

This survey incorporating Hall and Hord’s levels of use with respect to arts integration innovations needs more development and testing, but holds promise as a means of discerning the intersections between professional development and implementation of effective teaching practices.

**Collaboration/Planning and PAIR Professional Development**

Just as the research team asked teachers to document, so we also documented the professional development session discussions in order to study the coherence between session topics and levels of use in teachers’ practice. The professional development session documentation of participant discussions for Year Three appears in Tables Sixteen, Seventeen, Nineteen and Twenty.

In October of 2009, the PAIR teachers and artists conducted a brainstorming sessions focused on collaboration (See Table Sixteen).

[continued on next page]

## Table Sixteen: Pair Project Brainstorming on Teacher/Artist Collaboration

### Notes from a Professional Development Session

#### ***What does co-teaching with artists and teachers look like?***

- *Planned session in which artist takes the lead, then the lead shifts to the teacher, then back again... supporting actor vs. lead actor – planned in terms of minutes...(what could artist do when teacher is the lead actor?)*
- *Teacher restates*
- *Teacher reminds*
- *Teacher has a visual in the classroom to refer to/add to/document on as the t.a. teaches*
- *Teacher actively DOES the project with the students – becomes a part of a group*
- *Teacher leads the ‘debrief’ by interviewing the artist about the session they just completed*
- *Teacher documents – takes photos, takes notes, interviews groups or students as they are working – and makes that documentation visible for students and others*
- *Teachers takes two small groups; artist takes two small groups – they work parallel on the task presented by the artist*

#### ***What does it mean to reinforce or respond to work with what the teaching artist does when the artist is not there?***

- *Teaching artist and teacher plan for ‘BEFORE THE VISIT’ and ‘AFTER THE VISIT’ intentionally and explicitly*
- *Teacher has students journal/write respond to content before or after artist visit*
- *Teacher maps content connections with arts experience with students*
- *Teacher focuses on arts and non arts content vocabulary and links them visually in the room*
- *Teacher and artist create common assessments – including paper/pencil assessments, student critiques, conference sessions*
- *Teacher names and reinforces content standards being addressed in and through arts integration/artist visits*

In that same Professional Development session, the research team shared some of the results from Year Two of the PAIR project regarding collaboration (See Table Sixteen).

## Table Seventeen

### Sharing Data on Collaboration: Notes from a Professional Development Session

*An impressive 73.3% of PAIR teachers reported on this survey at the end of Year Two that they believed they have been participating in a learning community with goals aligned to the magnet cluster initiative, their schools, and Chicago Public Schools. Further, almost half of the PAIR teachers (46.7%) noted that they felt they did receive the district support necessary to collaborate across schools with community partners.*

- *There is evidence that explicit collaboration among PAIR teachers across the PAIR network has been challenging again during Year Two of the Project. Only 14.2% of PAIR teachers reported that this collaboration was occurring.*



- The Post-PAIR Annual Professional Development Survey (self-report) revealed that 73.4% of participating teachers now feel somewhat or very successful collaboratively planning arts integration projects with colleagues.
- On the Annual Professional Development Survey administered to PAIR teachers, the 4th grade teachers, who have just completed their second year in the program, reported they were feeling significantly more successful in collaboratively planning arts integration projects with their colleagues than 5<sup>th</sup> grade teachers, who were new to the program this year, did ( $t=2.530$ ,  $df = 8$ , significance  $<.05 = .035$ ). These results indicate that the PAIR program is having an effect over time and has promoted cross-school curricular sharing and reflection, which can only be fostered in multi-year initiatives.
- When asked about specific activities that contribute to cross-school sharing, teachers did not appear to be too active:
  - 7.2% report that they helped to drive effective and real collaboration as part of PAIR with multiple external partners and community resources.
  - 17.8% report that as part of the PAIR project they exhibited leadership in getting artwork displayed or performed outside of school, finding an audience during the year.
- PAIR TEACHERS
  - 10.7% report that as part of the PAIR project, they assisted in scheduling for arts integration co-planning and co-teaching time with teaching artists.
- PAIR TEACHERS:
  - 32.1% reported that they reinforced or built on arts activities when the teaching artists were not there.
  - 17.9% reported that they taught with teaching artists, integrating teaching and learning in arts and non-arts content areas.
- The 4<sup>th</sup> grade teachers (who have been in the project for two years) reported significantly more frequent participation in driving effective and real collaboration than the 5<sup>th</sup> grade teachers, new to the project this year, did ( $t = -2.185$ ,  $df=14$ , significance  $< .05=.046$ )
- PAIR TEACHERS:
  - 21.4% reported, through PAIR, being part of a leadership team to plan for the arts in their schools.
  - 25% reported that they shared the PAIR unit with their faculty peers who were not involved in the project.
- It is interesting to note the extent to which PAIR teachers felt that the professional development provided by the project enabled them to plan, implement and assess the arts integration/content units.
  - 60% reported that they participated in PD occasionally or frequently that helped them learn how to plan for curriculum integration.
  - 53.3% reported that they occasionally or frequently participated in PD that helped them learn how to implement curriculum integration lessons.
  - 46.7% reported feeling somewhat successful at assessing students' learning in the content field in the PAIR project. No teachers reported feeling very successful at this assessment.
- PAIR teachers generally reported feeling somewhat successful with using new instructional approaches learned through arts integration in PAIR project (66.7%), although no project teachers reported that they felt very successful in this endeavor.
- Nearly half of PAIR teachers in Year Two noted that students were beginning to participate in documenting their learning in these projects (42.8%) and 17.9% of the PAIR teachers reported planning with TAs to document student work that shows arts and non-arts content learning.

On the PAIR Professional Development Session Survey, Section One asked the teachers to comment on various elements of the collaboration they were engaged in with teaching artists and other teachers (items 1 – 6). Scores on these items across the four professional development sessions ranged from 3.3816 to 4.5132, indicated that teachers acknowledged that *some elements of collaboration were not currently happening in their site, but they received some preparation for those elements in the PD* while others reported that *elements of collaboration were happening in their sites and that they were making progress toward making them routine, thanks to this PD* (italics = language of the Likert Scale on the survey).

**Table Eighteen**

**Professional Development Session Survey Means Across Four Sessions for Section 1: PAIR Collaboration and Planning**

PD		Q1	Q2	Q3	Q4	Q5	Q6
Session 1	Mean	4.5000	4.5000	3.8846	4.2692	3.9615	4.6154
	N	26	26	26	26	26	26
	Std. Deviation	1.06771	1.24097	1.70474	1.53773	1.79957	1.57675
Session 2	Mean	3.7308	4.4615	4.1923	4.1154	2.8077	4.1923
	N	26	26	26	26	26	26
	Std. Deviation	1.75631	1.20767	1.47022	1.42343	1.81150	1.52366
Session 3	Mean	4.0667	4.7333	5.0667	4.2667	3.7333	4.7333
	N	15	15	15	15	15	15
	Std. Deviation	1.70992	1.43759	.88372	1.27988	1.83095	.70373
Session 4	Mean	4.1111	4.3333	3.6667	3.8889	2.7778	4.0000
	N	9	9	9	9	9	9
	Std. Deviation	1.69148	1.50000	2.12132	1.53659	1.71594	1.50000
Total	Mean	4.1053	4.5132	4.1974	4.1711	3.3816	4.4211
	N	76	76	76	76	76	76
	Std. Deviation	1.53691	1.28056	1.59181	1.42724	1.84728	1.41669

## Documentation and PAIR Professional Development

In other sessions, we asked them to comment on the nature of the data as well as the data collection systems in the PAIR project, discussing how we also are documenting and learning from documentation (See Table Eighteen).

### Table Nineteen: Sharing Results from the Research with PAIR Participants:

#### Notes from a Professional Development Session

*What do we notice? What does it mean for this school year?*

*What questions does this raise for you?*

##### Teacher Data

- *Why is the scheduling percentage (10.7%) so low?*
  - *Pay attention to what it takes to schedule the co-planning and co-teaching with the teaching artists.*
  - *Perhaps, teachers felt they didn't have enough time to plan and that is why people responded a certain way.*
  - *It is likely that people interpret the question differently*
    - *“Co-planning” versus “co-teaching”*
      - *What does co-teaching look like? What does it mean for the classroom teacher, for the teaching artist? What does it look like?*
      - *You can plan together and teach the same concepts, yet perhaps not teach at the same time.*
      - *Would it be helpful to define “co-teaching” as a group of PAIR teachers?*
- *Learning community → How do you define this?*
- *How can the teacher enhance the 10 hours with the teaching artist – when the teaching artist is there and when the teaching artist is not there?*
  - *Teacher can get in and participate, do the art making with the students; restate the teaching artists' questions and ideas for the students.*
  - *What is the intersection between what happens when the teaching artist is, and isn't, there?*
- *What does it mean to “reinforce and build on arts activities?”*
- *Year 2 data shows differences between 4<sup>th</sup> and 5<sup>th</sup> grade teacher responses – 4<sup>th</sup> grade teachers are much more confident.*

CAPE's methodology consistently incorporates the documentation of student learning in ways that communicate evidence of both process and outcomes. The Professional Development sessions during all three years of the project supported teachers' efforts to view documentation as part of their teaching, not separate from it. In one Professional Development session, teachers were asked to bring student PAIR work and develop documentation panels to demonstrate learning (See Documentation Panels in

Figures D, E, F). They then discussed the value of doing such panels, audience for the panels, and what could make the panels stronger as evidence of quality learning (See Table Twenty).

**FIGURES D, E, F: Documentation Panels Constructed During PAIR Professional Development**





**Table Twenty: Collaborative Reflection on PAIR Documentation Panels:**

**Notes from Professional Development Discussion**

***Documentation Panels: What was the entry point?***

- *Key terms – choreography, sculpture/shapes*
- *Use the checklist for effective documentation panels*
- *What do I want to see as a viewer?*
- *Needs an introductory piece – ‘what is this thing?’ A title is important*
- *Who is the audience? – Make the project explicit – ‘THIS PANEL TELLS THEIR STORY’*
- *Find the themes – how are all the activities related? What was the team looking for?*
- *Ask yourself some questions in order to organize documentation*
- *Math concepts – problem solving, team work*
- *At first, the activities didn’t seem to be related, but after awhile, the coherence emerged*
- *The role of student reflections/teacher/researcher reflections*
- *The role of the portfolio conference – framed the documentation*
- *Necessary narratives/added text for coherence/clarification*
- *Look for ‘similar’ artifacts and clustering them*
- *Research results helped to group the work... framing the work*
- *Analysis of the documentation becomes part of the professional development, part of the planning, part of the reflection/critique*

***What caught your eye? What stood out?***

- *The importance of imagery/photos*
- *Made me think of what I should do*

***Why did we have you work with other schools’ doc? And why in groups?***

- *Take into account how much we bring to the pail – is it enough to tell our story*
- *Showing relevant stuff – what makes sense – what actually shows the process – if it was my own work, I would know what was going on; the artifact needs to speak for itself*
- *If you are able to understand the context, then that’s a plus*
- *It’s not an exhibition – it tells a story – it’s not just a poster – a documentation panel is*

*different – it is intentional; it requires context/narrative*

- *Groups – pull more information through conversation – documentation panels are facilitated through discussion – it’s a collaborative investigative process*
- *Trying to uncover the inquiry question...back mapping –*
- *The documentation reflects the group processes that many of the students used in the PAIR projects – the documentation should be reflective of the process in the classroom*
- *Documentation becomes the tool for sharing PAIR... how you think about your work as a team in a school....and the ‘panels’ that result from work in the PAIRS.*

**Documentation vs. Data: How are they related?**

- *Documentation is not necessarily evidence.*
- *Doc. is a larger universe.*
- *Data – or evidence – answers a question.*
- *We need the context data regarding the teacher/artist process*
- *What did the teacher do?*
- *Where was the collaboration among the adults?*
- *How do we link the documentation to the teacher goals? Per the survey?*

On the PAIR Professional Development Session Survey, Section 4 asked teachers to comment on the session with respect to documentation (items 14-20). Mean scores for these items appear in Table Twenty below. Scores for these items across the 4 sessions of professional development ranged from 3.9041 (*Not currently happening/Some preparation received though in this PD*) to 4.6267 (*Happening now/progress toward making it routine thanks to this PD*) (italics = language of the Likert Scale on the survey).

This range across the items focused on what teachers are learning – and then doing – with respect to documentation is the highest of the four sections on the Professional Development Survey. These means suggest that the teachers recognize that the PAIR Professional Development has focused on documentation and that they are doing more of it in their schools as a result.

[continued on next page]

**Table Twenty-One**

**Professional Development Session Survey Means Across Four Sessions:**

**Section 4 Documentation of Student Learning**

Q14	Q15	Q16	Q17	Q18	Q19	Q.20
4.3846	3.9615	3.7308	3.3200	3.6154	4.2692	3.8846
26	26	26	25	26	26	26
1.32897	1.63660	1.56353	1.72530	1.67516	1.48479	1.79615
4.3600	3.9600	4.2400	4.2083	4.2000	4.4800	4.2800
25	25	25	24	25	25	25
1.55134	1.69509	1.36260	1.31807	1.44338	1.15902	1.13725
4.7333	5.0000	5.2000	4.3333	4.6667	5.2000	4.6000
15	15	15	15	15	15	15
1.22280	1.36277	.94112	1.54303	1.29099	.86189	1.05560
4.1111	4.5556	4.4444	4.0000	4.7778	5.1111	4.7778
9	9	9	9	9	9	9
1.26930	1.66667	1.23603	1.73205	.97183	.78174	.83333
4.4133	4.2400	4.2800	3.9041	4.1600	4.6267	4.2667
75	75	75	73	75	75	75
1.36652	1.63443	1.42904	1.59133	1.49811	1.23871	1.37873

**Peer to Peer Sharing and PAIR Professional Development**

The Session Survey asked teachers each time they attended a Professional development session to comment on the degree to which they were presenting and discussing PAIR work with other teachers at their school and outside of their school (Items 11 and 12). The Survey also asked them to comment on the degree to which the professional development was providing them with ideas for arts integrated activities in general (Item 13). These means were the lowest ranges of the four sections on the survey, ranging from 1.1806 to 3.9467, indicating that teachers acknowledged that they were not doing much sharing and that means for such sharing were not thoroughly addressed in the professional development sessions (*1 – not currently happening/not addressed in PD, 3 = Not currently happening/some preparation received though in PD*) (See Table Twenty-Two)

**Table Twenty-Two: Professional Development Session Survey Means Across Four Sessions: Section 3 Peer to Peer Sharing**

Q11	Q12	Q13
3.8846	3.7308	.1250
26	26	32
1.65715	1.31325	.70711
3.6400	2.7600	.0000
25	25	16
1.60416	1.50776	.00000
4.4667	4.1333	3.9333
15	15	15
1.24595	1.64172	1.86956
4.1111	3.0000	2.4444
9	9	9
1.36423	1.50000	1.42400
3.9467	3.4000	1.1806
75	75	72
1.53247	1.54220	1.93796

These data are consistent with the data received through the Year-End Curriculum Survey and other qualitative data sources (See Goal 1C above). It seems that teachers may not see themselves in cultures in which sharing is possible and adaptation of activities beyond the project itself are possible. If such goals are part of partnerships such as PAIR, then more district support such as the pending dissemination event scheduled for November 2010 are essential.

**Extending and Deepening the Curriculum and PAIR Professional Development**

Items 7 – 10 on the Professional Development Session Survey asked teachers to comment on how they were engaging PAIR with their focus non-arts content area. The mean scores ranged from 4.2133 to 4.4868. **This section of the survey reflected the strongest report of preparation in the professional development sessions as well as the strongest report of the teachers actually integrating what they were learning to extend and deepen their curriculum through PAIR experiences (See Table Twenty-Three).**



**Table Twenty-Three: Professional Development Session Survey Means Across Four Sessions:**

**Section 2: Extending and Deepening the Curriculum**

Q7	Q8	Q9	Q10
4.7308 26 1.25085	4.7692 26 1.17670	4.3846 26 1.09825	3.6923 26 1.73826
4.3077 26 1.54322	4.2800 25 1.24231	3.7200 25 1.33915	4.1600 25 1.02794
4.4667 15 1.24595	5.1333 15 .91548	4.5333 15 1.35576	4.8000 15 1.42428
4.3333 9 1.11803	4.5556 9 1.23603	4.6667 9 1.00000	4.8889 9 1.36423
4.4868 76 1.33160	4.6533 75 1.17971	4.2267 75 1.25820	4.2133 75 1.47312

**Attendance at PAIR Professional Development Sessions**

A final parameter regarding impact of the PAIR project on teachers was the attendance at Professional Development sessions offered by PAIR/CAPE staff. Table Twenty-Four below indicates teacher attendance at PAIR sessions during Year Three (2009-2010). Table Twenty-Five indicates teacher attendance at PAIR sessions across the three years of the project (2007-2010).

While it is clear that the 6<sup>th</sup> grade teachers attended fewer sessions than their peers in 4<sup>th</sup> and 5<sup>th</sup> grade, due to the structure of the program, it is still interesting that most 4<sup>th</sup> and 5<sup>th</sup> grade teachers continued to attend beyond the first year of the program. Only 3 sixth grade teachers attended 3 or 4 of the sessions in Year Three, even though they were new to the program and ostensibly would have found the Professional Development helpful.

**Table Twenty-Four: Attendance at Professional Development Sessions: Year Three of PAIR**

**Project (grade levels in parentheses)**

<b>Attended All Four General Sessions</b>	1.40 (5) 1.20 (4) 3.20 (4) 5.60 (6)
<b>Attended Three of Four General Sessions</b>	1.60 (6) 3.60 (6) 3.30 (5) 5.30 (5) 7.40 (5) 7.10 (4) 9.60 (6) 11.40 (5)
<b>Attended Two of Four General Sessions</b>	1.50 (6) 1.10 (4) 3.40 (5) 5.40 (5) 5.20 (4) 7.50 (6) 7.60 (6) 9.50 (6) 9.30 (5) 9.40 (5) 11.60 (6) 11.30 (5) 11.10 (4) 11.20 (4)
<b>Attended One or None of Four General Sessions</b>	3.10(4) 3.50 (6) 7.30 (5) 11.50 (6)

\*5.10 – attendance not recorded

(continued on next page)

**Table Twenty-Five: Attendance at Professional Development Sessions**

**Across Three Years of PAIR Project**

Teacher Names	school	grade	PD Attend Other	PD Attend 08	PD Attend 09	PD Attend 10	TOTAL
1.20	1	4	3	3	4	4	14
3.20	3	4	2	2	3	4	11
1.10	1	4	3	3	3	2	11
5.30	5	5	2	1	4	3	10
3.30	3	5	1	2	3	3	9
7.30	7	5	2	1	4	1	8
3.10	3	4	2	2	3	1	8
7.60	7	6	2	1	3	2	8
3.40	3	5	1	2	3	2	8
11.10	11	4	1	2	2	2	7
7.40	7	5	0	1	3	3	7
1.50	1	6	1	1	3	2	7
9.30	9	5	1	1	3	2	7
1.40	1	5	3	0	0	4	7
7.10	7	4	1	0	2	3	6
5.20	5	4	1	1	2	2	6
5.60	5	6	0	1	1	4	6
9.40	9	5	1	1	2	2	6
11.30	11	5	0	1	2	2	5
5.40	5	5	0	1	2	2	5
5.10	5	4	1	1	2		4
11.40	11	5	0	0	1	3	4
11.60	11	6	0	1	1	2	4
11.20	11	4	0	0	1	2	3
9.60	9	6	0	0	0	3	3
3.60	3	6	0	0	0	3	3
1.60	1	6	0	0	0	3	3
9.50	9	6	0	0	0	2	2
7.50	7	6	0	0	0	2	2
3.50	3	6	0	0	0	1	1
11.50	11	6	0	0	0	1	1

The project was designed to build a professional community throughout the three years, with sufficient time and collective participation in professional development both within and across partner schools.

This too is a characteristic of effective professional development programs (Ingvarson, Meiers, Beavis,

2005). Teachers were repeatedly invited to consider means of collaborating within their grade levels, across grade levels, across schools and across the PAIR project as well as quite obviously with the teaching artists working at their schools. Joyce and Showers note the importance of “the proactive and productive use of peers” when teachers are learning new skills and changing their practice (2002, p. 3). The three-year PAIR project in which 4<sup>th</sup> grade teachers took the lead in planning an integrative arts project with support from CAPE and teaching artists, and then engaged 5<sup>th</sup> grade teachers the second year of the project and 6<sup>th</sup> grade teachers in the third year represents an interesting approach to problem solving, shared planning, and the transfer of skills and creative application of teacher learning.

Franke, Carpenter, Levi and Fennema conducted a study of math teachers’ generative change as a result of focused professional development on student thinking and understanding (2001). One of their indicators of professional development effectiveness was the degree to which the teachers continued to implement the principles of the mathematics program four years after the intervention ended. Though the PAIR program has just completed its three-year cycle, the portfolio conference comments from teachers regarding their expectation to integrate what they had learned in the project in future teaching did emerge (See Table Twenty-Six). Some teachers made no mention of how PAIR might affect their teaching or did not respond to the interviewer’s questions in that regard. Other teachers were clearly able to describe how the project will make a difference in their classrooms. Of course, ideally, the research could continue in order to follow teachers for several years after a project ends in order to more accurately determine whether there are residual effects from involvement in an innovation such as PAIR.

The Franke et al study also provides some compelling insights relative to the portfolio conference methodology. In the Franke et al study, the professional development focused on student thinking and the researchers felt that it was this focus that really contributed to substantial change in the teachers’ thinking. The portfolio conferences in the PAIR project provided the teachers with a means to observe students’ thinking as expressed in their explanations, descriptions, and evaluations of the work products in the conferences. The teachers could not interact with the students during the conferences, but rather observed the children interacting with each other. The students in turn were able to observe their teacher’s analysis as she/he answered questions offered by the interviewer. This approach, if deepened and repeated, may be a valuable mode of professional development in and of itself for future

projects. Learning about student thinking is one important way to plan for teaching to address gaps, misunderstandings and students' inabilities to articulate what they know and how they know it.

**Table Twenty-Six: Teacher Descriptions of Practice After PAIR Project Ends**

<b>Portfolio Conference Comments</b>
<p>And if I'm here next year, I will do the same things with the novel that I did with Charlie and Reggie even if they weren't...you know, even though they're not going to be involved in the classroom. I would still go through the same lessons that they went through. And the stuff that I got from Reggie is very useful in helping teaching students how to write using their own voice. So for my own personal, I see a major benefit in how it's going to help me teach things in the future. And we do refer to it throughout the year, so I don't feel that it was something that was just done in isolation (11.30).</p>
<p>Well, actually, I was talking to (the teaching artist), I would actually do this same building. Last year we did something similar, but we used a different scale. We used centimeter cubes to six inches. I think you remember we made those huge buildings. And this really goes along well with our math series right now (5.20).</p>
<p>Go beyond paper and pencils. Involve more art. Because one way it kind of like got the creativity out there of their head and also allowed them to do things that is more fun, not all like paper and pencil boring stuff, you know. And I think when they are having fun doing things that they like to do, they were able to give me a little bit more of what they were asked. So just like the biography, like this, we can use it next year, because I know how to do it. I know step by step how to do it. I think the kids feel more comfortable to express themselves if they are allowed to think through it, just like the portrait they did before – the kind of food they eat, their facial feature, the color of their face represent who they are. So instead of how we usually do, oh, a biography, you need an introduction, what day they were born, how they're...it's more...like going through this art project let them kind of like a brainstorm, let them think through it before they put it in writing. So it's kind of like help them in their thinking process and their final product. Not only just they do it because the teacher tells them to do. I learned things from it, too. So I can get what we learned here to go do it (3.20).</p>

**Portfolio Categories of Reflective Practice and Professional Development Session Attendance**

If we return to those who demonstrated the reflective practice categories from the portfolio conferences and now correlate it to other data points, qualitative and quantitative, some further distinctions now occur (See Table Twenty-Seven). First, of the 12 teachers who appear in the High and High/Middle reflective occurrence categories, 7 are 4<sup>th</sup> grade teachers (1.10, 3.20, 5.10, 5.20, 7.10, 11.10, and 11.20), 5 are 5<sup>th</sup> grade teachers (1.50, 7.30, 7.40, 11.30, and 11.40). All attended at least 25 % of the

Professional Development Sessions offered and 9 of the 12 attended 50% or more of the Sessions as part of the PAIR project.

**Table Twenty–Seven: Portfolio Conference Coded Categories of Reflective Practice: High and High/Middle and Number of Professional Development Sessions Attended**

Yellow (High)	Green (High/Mid)
3.20 (grade 4) (attended 11 PDs)	1.10 (grade 4) (attended 11 PDs)
5.10 (grade 4) (attended 7 PDs)	1.50 (grade 5) (attended 6 PDs)
7.10 (grade 4) (attended 6 PDs)	5.20 (grade 4) (attended 6 PDs)
7.30 (grade 5) (attended 8 PDs)	7.40 (grade 5) (attended 7 PDs)
11.10 (grade 4) (attended 7 PDs)	11.20 (grade 4) (attended 3 PDs)
11.40 (grade 5) (attended 4 PDs)	11.30 (grade 5) (attended 5 PDs)

#### Four Teacher Profile Effects and PAIR Program Impact

The data analysis regarding teachers in the PAIR project raises some interesting hypotheses that merit further investigation. The data indicate specific teacher profiles that relate to categories of teacher impact, based on whether these teachers *demonstrated significant differences from their peers on specific variables*, as reported on the surveys, the *coded comments from portfolio conferences*, the *coded open-ended responses on the surveys*, and the *reported pedagogy identified on student work labels*. Based on a mixed methods approach that incorporates these qualitative and quantitative data, the following effects show promise with respect to impact of the program and possible relationship to student achievement:

- **The Content Expertise Effect: Pedagogical Content Knowledge Matters**
- **The Documenting to Learn Effect: Collecting Student Work Inspires Reflection**
- **The Fourth Grade Effect: Designers Have Ownership**
- **The Healy Effect: Initiatives Build on Other Initiatives in a School**

1) The data suggest that teachers in arts partnerships *who stay focused on the learning in the non-arts content* that they are responsible for are more likely to see student achievement. In the PAIR project, we might call this “**The Content Expertise Effect**”. Shulman explains this phenomenon in a way that is appropriate for the discussion here. Shulman claims that teachers need more than straightforward

content knowledge. They need pedagogical content knowledge, or PCK, defined as a blend of content and pedagogy “into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners and presented for instruction” (1987, p. 8).

An arts integration innovation has the potential to contribute to teachers’ pedagogical content knowledge (PCK), if the teachers are alert and focused on their non-arts content throughout the project. Some teachers in the PAIR project demonstrated more pedagogical content knowledge (PCK) than others. Teachers appearing to have strong PCK knew what students would be able to transfer in an arts integration context. They had multiple ways of describing or explaining to their students in ways that are appropriate for the grade and age they were teaching and were able to translate and make connections to their content from the art forms, even when they were not familiar with that art form. Teachers with strong PCK had a sense of the whole of the content field and the particular components of the content that they were teaching at their grade level.

According to Shulman, PCK is what distinguishes a content specialist from a true teacher. Even if these teachers did not fully invest in the professional development offered by the project or feel fully capable of experiencing the art forms offered in their classrooms, they remained focused and confident of their non arts content goals; they knew the gaps in students’ understandings in those content areas; they knew what they needed to expect from the teaching artist partnerships to achieve specific content goals for their students. Having such knowledge and expertise in their subject areas enabled them to be clear on the goals for their students and their classrooms. Teacher knowledge of their content is even more critical in an innovative, inquiry-oriented classroom (Shulman, 1987). Table Twenty-Eight illustrates comments by five teachers who demonstrated focused attention on their non-arts content and were able to articulate elements of that curriculum consistent with pedagogical content knowledge. The project research did not intend to focus on this aspect of the professional development engendered through the PAIR project. But the PAIR design, which explicitly focused on specific non-arts content (mathematics, writing or culture/world language), seemed to encourage participating teachers to demonstrate their expertise in their content and focus the project specifically toward student learning in that discipline, once they were comfortable with the teaching artists and the concept of arts integration in their classrooms. There were, as noted above, some teachers who did not fully embrace arts integration as participants in the arts experiences (5.20 and 11.10); but those teachers also

demonstrated their attentiveness to the benefits of the approach for their students and attested to the value added for their classrooms. In other words, the teachers with PCK does not have to dance or even appreciate dance as an art form to know how dance can contribute to content learning for students.

**Table Twenty-Eight: The Content Expertise Effect: Pedagogical Content Knowledge Matters**

***Portfolio Conference Comments: Focus on Non-Arts Content***

*I think definitely they get...this really went along with and supported the math curriculum that we do. We work with hexagons; we work with trapezoids and rhombuses and triangles and fractions, and teaching them parts of a whole, so that really helped with this. They also, which they didn't say, with making these hexagons, they did a ton of measurement to make sure the sides were equal. Some of them did better jobs than others, but they did a lot of measurement, which was something that they really, really needed for their work. We do go over the concepts, but this is like a whole – it makes them generalize the information that they've learned, which I think is kind of what you're trying to do (5.10).*

*Well, for myself, the value of collaborating with an artist is that I understand what their technique is and how it can help my students advance in their development of writing. And I keep referring to the writing because that's what our focus is, is developing their writing. So collaborating with them helps me gain a deeper understanding of their arts and how I can integrate it with what I do in my classroom (11.10).*

*I put it in my research that I did on my master's program. We were trying to expand on what the students had learned in 4th grade and what they had learned with PAIR, and we were focusing on having the students develop their voice and recognizing point of view with main characters in a fiction story. The main purpose that we were, what we were looking to do was on all writings, regardless of whether it's ISAT or what we're using it for, we always want the student's own voice to come through and not just mimic what it is that they've read, but we want their input, their take on things (11.30).*

*For me, as a teacher, it has really helped me to instruct my students how to write better, I mean, how to really look at not only when we read a story, about characterization, motivation, plot. I will tell you this class, we have read some really difficult books this year, higher level, higher thinking, and I really do think having the PAIR program has helped my students look at characters, understand plot, conflict, resolution a lot better than my other classes (11.20).*

*Scale is a very difficult concept. It's a difficult concept, especially application of scale. You know, you can do it on pencil and paper, but to actually apply it is a whole other ball game. Not only can they do it on pencil and paper, but they could apply it, you know, apply it to build something or construct something now, whereas...you know, that is really difficult to get a student to comprehend that. I think it's beneficial on the test because it will help them retain it. Once you have applied it and used it, you have a tendency to retain it more than, okay, this is how you do it and it's gone. I think it's of great value because the kids were able to talk about math in a reasonable way. They truly have a much better understanding than they would have if I said open up to Page 200 and let's do scale (7.30).*



\* \* \*

2) *Teachers who document* (including collecting student work, reflecting on teaching, outlining the curriculum plan) *and assess* regularly as part of their teaching in an arts partnership are more likely to see student achievement. In the PAIR project, some teachers more than others clearly saw the value of documenting as they were asked to do for themselves and their students, though this realization did not come easily or immediately in the three-year project. We might call this “**The Documenting to Learn Effect**”.

The teachers who were more clearly invested in the PAIR Pails were also more able to articulate what they and their students were learning as evidenced in the Portfolio Conferences. In other words, for some teachers, the act of documenting and the engagement in discussion of documentation at professional development sessions contributed to the impact that the PAIR program had on their learning and their teaching. The teachers who offered reflections on their teaching in the form of student work labels were also the ones who were able to comment on the benefits of students participating in the documentation and the benefits for teachers who can learn from what they collect through a documentation process (See Tables Twenty-Nine, Thirty and Thirty-One).

**Table Twenty-Nine: The Documenting to Learn Effect: Collecting Student Work Inspires Reflection**

*I just think that sometimes we learn things, we take a test, and then maybe the test hangs on the refrigerator for a little while and then the test goes away in the garbage or the recycling. This, you know, you have a hard time throwing something like this out. You do get to kind of peek inside their psyche and kind of get an idea of what’s going on in their heads. And then we have evidence at the end, and it’s evidence that they can be proud of. It’s beautiful and it’s something that we don’t want to go away. We want to hang it and we want to be proud of it. That’s what I feel is nice about this whole process (1.50).*

*I’m using things that, you know, we’ve done the pail, like we’ve finished with it, and now I’m just seeing that this should be incorporated because, again, this is so much better than what we were doing in February...no, in December, and I would really like to hand in my pail almost at the end of the year, you know, because really, we keep reiterating what we’ve learned (11.20).*

**Table Thirty: The Documentation Effect: Teachers' Responses on Year-End Survey: Impact of PAIR Documentation of Learning by Students**

*Students can learn from each other (1.10).*

*They would say "Wow". This is what I have at first and now the final product. They were amazed to see from the beginning with just the basic and at the end they created something very amazing (1.20).*

*It shows the students the big picture (3.10).*

*They can actually see where they began and where they ended. It helps them to understand the process as well as the finished product. I think it allows them to see how far they have come from an idea to an actual finished product that represents them (3.40).*

*Perhaps they see how much their work is valued (3.60).*

*They're able to be more realistic and honest about their effort and their journal entries reflected how they were evaluating what they were doing (5.30).*

*When students see their work in documentation, they are able to identify the missing part (5.60).*

*When they reflect back on themselves and their work, they are usually very hard on themselves. They are able to see what they did well and what they would do differently in the future (7.50).*

*They can see their growth and assess their own learning. They can see what they might need to revisit and what they accomplished as a whole group (7.60).*

*Students can assess themselves and decide if or where improvement is needed. It also helps their confidence to grow (9.50).*

*They learn the mistakes, they correct them, and they learn not to do them again (9.60).*

*A student does not learn if they never see their graded/evaluated work. Providing students with feedback on their work allows students to focus on areas of need (11.10).*

*Students have a feeling of ownership and enjoy doing more work (11.20).*

*Students see themselves collaborating with their peers, working toward a common goal. Students observe the given and take needed to work successfully together (11.60).*

### Table Thirty-One

#### The Documentation Effect: Teachers' Responses on Year-End Survey:

#### PAIR Documentation of Student Learning by Teachers

*Seeing that my students who didn't know what was going on are able to do, especially the special needs students. I was able to see the progress of the students' work. They were amazing (1.20).*

*Teachers have to remember a lot day to day. I feel without good documentation things get lost in our heads very easily and good ideas are forgotten (7.50).*

*It helps me evolve as a teacher because I see the process (9.60).*

*I witnessed a growth in my teaching and writing (11.20).*

*Similar to students, if teachers receive no feedback in their teaching methods they have no way of knowing if their teaching is effective or where they may need to make adjustments (11.30).*

*Having the unit document provides evidence of success and failure. Know what works and what needs improvement is key to developing an engaging, informative activity (11.30).*

*When viewing pictures, documenting forced me to evaluate the effectiveness of an assignment. When you document your practice it preserves the pathways you traveled to achieve your goal. It allows you the ability to review and critique what you did. Then, when you repeat the same or similar lesson, or show it to colleagues, you can delete or add on to the plan as needed (11.60).*

\* \* \*

3) Teachers who actively contribute to the design of an arts partnership project are more likely to fully participate throughout the life of the project and see resulting student achievement. In the PAIR project, this might be known as “**the 4<sup>th</sup> grade effect**”, in that the 4<sup>th</sup> grade teachers show greater evidence of investment, ownership, and consistent documentation of achievement than do most 5<sup>th</sup> and 6<sup>th</sup> grade teachers who joined the project later.

Results from Year Two of the project revealed that the 4<sup>th</sup> grade teachers (who have been in the project for two years) reported significantly more frequent *participation in driving effective and real*

*collaboration* than the 5<sup>th</sup> grade teachers, new to the project this year, did ( $t = -2.185$ ,  $df=14$ ,  $significance < .05=.046$ ).

This year, in Year Three, with respect to the coded reflective practice totals from teachers in the portfolio conferences, 7 of the 12 highest scoring teachers were 4<sup>th</sup> grade teachers.

Means from the Year-End Curriculum and Teaching Survey collectively were compared across the three grade levels groups through an ANOVA. Because the PAIR project was structured as a graduated model, in which a grade level was added each year, this comparison provides some worthwhile information.

There were significant differences between the 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> grade teachers on items 5 and 6 regarding the degree to which teachers reported meeting with the artists/arts specialists and with other teachers in the PAIR project with the 4<sup>th</sup> grade teachers reported significantly more planning:

Item 5: (ANOVA, significance  $<.05 = .049$ )

4<sup>th</sup> grade teacher mean: 3.6667

5<sup>th</sup> grade teacher mean: 2.7000

6<sup>th</sup> grade teacher mean: 2.1000

Item 6: (ANOVA, significance  $<.05 = .027$ )

4<sup>th</sup> grade teacher mean: 4.4444

5<sup>th</sup> grade teacher mean: 2.8000

6<sup>th</sup> grade teacher mean: 3.1000

These results indicate that the **4<sup>th</sup> grade teachers, even though they were receiving fewer services, including artist visits, in year three of PAIR, report more collaboration than their peers in grades 5 and 6.** One could infer that the collaboration within the PAIR project remained stronger for the 4<sup>th</sup> grade teachers, perhaps due to the fact that they were key participants in the design of the project in Year One and continued to be the most invested in the program and the collaborations with the artists.

There were also significant differences across the teacher reported activities regarding arts integration with respect to movement/dance and mathematics (Item 35) and movement/dance and language arts (Item 36). These data suggest once again that **4<sup>th</sup> grade teachers, regardless of the art forms they experienced with teaching artists, report significantly more movement and dance associated with teaching mathematics and language arts than their colleagues in grades 5 and 6:**

Item 35: (ANOVA, significance  $<.05 = .007$ )

4<sup>th</sup> grade teacher mean: 3.4444

5<sup>th</sup> grade teacher mean: 2.8000

6<sup>th</sup> grade teacher mean: 1.7000

Item 35: (ANOVA, significance  $<.05 = .005$ )

4<sup>th</sup> grade teacher mean: 3.6667

5<sup>th</sup> grade teacher mean: 3.4000

6<sup>th</sup> grade teacher mean: 1.8000

Although these were the only significant differences between teachers' responses by grade level on the 40-item Year End Curriculum and Teaching Survey, they may indicate trends that other data sources can further clarify with respect to impact of the project on teachers in a project that was structured explicitly for length of involvement according to the grade level taught. There were no significance differences in the control group schools across grade levels. These data would suggest that at least certain teachers at the 4<sup>th</sup> grade level felt more engagement and participated in arts integration experiences more fully than their peers at grades 5 and 6.

There were some interesting trends with respect to individual items on the year-End Curriculum Survey regarding grade level results. There were six individual teachers from the High and High/Middle Portfolio Conference category groups (total of 12 teachers in those groups) who demonstrated significant differences or approaching significance with respect to their peers in grades 4,5,6 (See Table Thirty-Two). Five of the six teachers are 4<sup>th</sup> grade teachers who have been with the PAIR project all 3 years. However, in the case of two of those 4<sup>th</sup> grade teachers (5.20 and 11.10), the differences represented a below mean response. That is, these two 4<sup>th</sup> grade teachers, who demonstrated High or High/Middle range reflection in the portfolio conference categories were also clear about what did not happen in the project in their experience. Teacher 5.20, reported significantly less *participation as a student, practicing and learning the art form while the artist led the session*. This teacher expressed some discomfort with the performance art form during her portfolio conference, yet was clear about the advantages she perceived for her students in integrating the arts and the non-arts content area. She chose to step back from actively participating in the art making while the teaching artist was there.

Similarly, teacher 11.10, reported much less *discussion and feedback*, i.e., co-teaching, with the teaching artist(s) *for students*. She also reported fewer contributions on her part regarding *innovative arts approaches*. She seemed to experience the project, less as an active participant during the arts integration, but was capable of extending the experience for her students when the artist was not there.

These trends in 2 fourth grade teachers indicate different ways of implementing and perceiving an innovation with an external partner – ways that may in fact be no less effective than those who fully participated specifically in the arts learning with their students and the artists.

**Table Thirty-Two: Teachers and Significant Differences from all PAIR Teachers Grades 4, 5, 6 on Specific Indicators as Self-Reported on Year-End Curriculum and Teaching Survey**

Teacher and Grade Level	Indicator/Item	Mean Scores: Individual vs. All PAIR Teachers (higher mean = higher incidence)	Significance P = <.05
1.20 (gr. 4)	#15 – Teacher reported explaining, presenting, and getting feedback on PAIR units from other teachers at her school more often than her peers in grades 4,5,6.	6.0000 3.2857	.069 (approaching significance)
1.10 (gr.4)	# 11 – Teacher reported she develops inquiry questions for the curriculum more often than her peers in grades 4,5,6.	6.0000 3.6667	.056 (approaching significance)
	# 16 – Teacher reported explaining, discussing, and getting feedback on PAIR units from teachers who are not from her school more often than her peers in grades 4,5,6.	5.0000 3.3214	.012
	# 36 – Teacher reported using movement/dance in language arts activities in her classroom more often than her peers in grades 4,5,6.	6.0000 2.8214	.030
	#37 – Teacher reported using movement/dance to understand cultures and identity in her classroom more often than her peers in grades 4,5,6.	6.0000 2.9286	.056 (approaching significance)

(continued on next page)

7.10 (gr. 4)	# 35 – Teacher reported using movement/dance to understand math concepts/math problems in her classroom more often than her peers in grades 4,5,6.	5.0000 2.8571	.060 (approaching significance)
5.20 (gr. 4)	# 40 – Teacher reported less participation as a student when artist was teaching than her peers in grades 4,5,6.	1.0000 4.5714	.016
11.10 (gr. 4)	# 3 – Teacher reported less modeling discussion and feedback with artist for student than her peers in grades 4,5,6.  #10 – Teacher reported less brainstorming and contributing her ideas to innovative arts integration approaches than her peers in grades 4,5,6.	3.0000 5.0357  2.0000 4.4286	.039   .057 (approaching significance)
7.30 (gr. 5)	# 32 – Teacher reported using music to understand math concepts or problems more often than her peers in grades 4,5,6.  #35 – Teacher reported using movement/dance to understand math concepts or problems more often than her peers in grades 4,5,6..  #37 – Teacher reported using movement/dance to understand different cultures and identity in her classroom more often than her peers in grades 4,5,6.	5.0000 2.4286  5.0000 2.5357  6.0000 2.9286	.030   .060 (approaching significance)  .056 (approaching significance)

Fourth grade teachers repeatedly demonstrated more ownership and independence with PAIR work as they described their involvement in the project than 5<sup>th</sup> and 6<sup>th</sup> grade teachers did in the qualitative data as well (See Table Thirty-Three).

**Table Thirty-Three: The Fourth Grade Effect: Designers Have Ownership**

*I'm getting a lot of, like, input from them. I'm getting a lot of ideas. Without (the teaching artist) here, I'm able to go ahead, like I'm able to see what I can be able to plan for next year, or without them in here. So it's really like they give me fully great ideas and all this. With (teaching artist), I believe I still need him in here with the music. But with art, I'm able to...the only thing is, like, the materials I need, but then besides that, I'm able to do this on my own. (1.20).*

*For PAIR, there was little collaboration in development for me this year because ideas were developed previously. It seems that when it is a repeated program, collaboration means discussing goals, not setting goals (1.40, 5<sup>th</sup> grade).*

*...how much it has changed from one year to two years, especially with me being in three years. Just the comfort level and knowing what to do, and I was able to help the kids even better when the artist was outside the room, because then I would reinforce the concepts and have them write for them (7.10).*

*The second year I was able to implement it in some of the stories that we read, and bringing out the motivations of the characters, and how the characters changed throughout the story. And this year the students used the techniques that (the teaching artist), our playwright, taught them, to develop their own stories, and on their final pieces, the Young Authors piece that we write every year. This year it seemed to go a lot easier. We didn't collaborate as much as we have in the past, or emailed or spoke as frequently as we did in the past, and I think that comes from the fact that we've been together for three years. We worked on the same things for three years (11.10).*

\* \* \*

4) Teachers who have experience with teaching artists and arts partnerships are more likely to be independent consumers of projects like PAIR, needing less support while consistently reporting satisfaction with the collaborations, even when they are less than perfect. In the PAIR project, this might be known as “**The Healy Effect**”, given that the data show Healy School teachers demonstrating significantly higher levels of satisfaction with the partnership, the professional development, and the outcomes for their students. Healy is a long-time CAPE partner school and has as a school had intensive arts integration professional development over many years.

One teacher at Healy came to the project late due to a maternity leave (1.60) and one teacher left the school. The remaining 4 teachers in the PAIR project, 1.20 (4<sup>th</sup> grade), 1.10 (4<sup>th</sup> grade), 1.40 (5<sup>th</sup> grade), 1.50 (5<sup>th</sup> grade) attended professional development sessions at a higher rate than most of their peers as follows:

1.20 – attended 14 PD sessions across 3 years

1.10 – attended 11 sessions across 3 years

1.40 – attended 7 sessions, including all 4 sessions in year 3

1.50 - attended 7 PD sessions,

1.60 - (new to project in year three) – attended 3 of the 4 PD sessions



Just these attendance figures indicate that Healy as a school community appeared to participate more fully in the project by attending Professional Development sessions offered by CAPE. Healy is also a school in which the project did disseminate evenly from 4<sup>th</sup> to 5<sup>th</sup> to 6<sup>th</sup> grade, perhaps due to the fact that at least 1 sixth grade teacher was involved, if on the periphery, from the first year.

The attendance data triangulates with the Year-End Curriculum and Teaching Survey in which there was a significant difference between Healy and the paired control group school, Holden, with respect to the *impact of professional development sessions on the arts integrated activities teachers reported using in their classrooms (#17)* with respect to one matched pair of schools. Healy teachers reported a significantly greater impact of professional development on their practice than did the control group school, and was the only one of the PAIR schools to do so.

Also, as noted in the Goal 1B section of this report (addressing the development of partnerships with teaching artists and external resources), there were significant differences between Healy and the control group school, Holden, with more occurrences reported in the treatment school teachers in the frequency of *teacher brainstorming to contribute to teacher/artist planning*, the frequency of *coming to consensus during planning meetings between artists and teachers*, and the frequency of *modeling discussion and feedback in front of students in the classroom*.

Regarding Goal 2 A (in which teachers were asked to report on their use of inquiry questions and the degree to which they reflected on their teaching), there were no significant differences in the treatment and control group teachers as groups with respect to *reporting their success at predicting the quality of student work over time (#20)*, except in the case of the matched pair of Healy and Holden, in which *Healy teachers did report increasing success at predicting quality as the project continued*.

There was also a significant difference between Healy and Holden with respect to the degree to which students documenting and assessing their own learning, with Healy teachers reporting their *students documenting and assessing* more often than the control group teachers did (See Goal 2C).

**In all, Healy showed positive significant differences in 8 indicators of implementation based on the Year-End Curriculum and Teaching Survey, more than any other PAIR school in comparison with their paired control group school (item # 1,2,3,17, 20, 25, 30, 31).**

One possible explanation for this engagement on the part of one school that the research seems to suggest is that Healy teachers knew what to expect and knew how to engage with a community partner focused on arts integration with non-arts content in ways that the other five participating treatment schools did not. Even if all of the specific teachers in PAIR had never partnered with a teaching artist before, the culture of the school is such that these partnerships are welcomed, familiar and expected. The 2 fourth grade teachers, 1.20 and 1.10, had worked with teaching artists many times before, thus setting a norm for practice more easily perhaps than other 4<sup>th</sup> grade teachers in the other 5 schools.

It is not clear whether this familiarity with the process is actually a positive element in how much teachers were able to learn from the experience, nor is it clear whether this element contributes to students’ learning to a greater degree than in other schools.

\* \* \*

**Considerations for Making Connections: Teacher Impact Effects and Student Learning Outcomes**

While it is not possible to have a singular ranking of teachers with respect to their learning during PAIR or the impact of PAIR on them and their classrooms, it is possible to identify the teachers who demonstrate these 4 “effects” more clearly than their peers (See Table Thirty-Four).

**Table Thirty-Four: The Four Teacher Impact Effects in PAIR Project**

<b>Content Expertise Effect</b>	<b>Documenting to Learn Effect</b>	<b>4<sup>th</sup> Grade Effect</b>	<b>“Healy” Effect</b>
5.10	1.50	1.10	1.10
7.30	5.20	1.20	1.20
11.10	7.10	3.20	1.40
11.20	9.50	5.10	1.50
11.30	11.20	5.20	1.60
	11.40	7.10	
		11.10	
		11.20	

Teachers who appear in more than one of these ‘effect columns are: 1.10, 1.20, 1.50, 5.10, 5.20, 7.10, 11.10, 11.20.

It may be worth investigating whether these 8 teachers' engagement in these particular ways and under these parameters affects the achievement of their students. Note that two of these effects are by virtue of grade level (4<sup>th</sup> grade) and school affiliation (Healy) and two of these effects are due to what teachers themselves have offered and reported about what they did in the project and what their perceptions of learning are (Content Expertise and Documenting to Learn).

The method of investigating individual teachers and the impact that PAIR has had on them and their practice has compelling implications for how to study the relationship between teacher learning and student achievement. It is important to offer the necessary caveats to such investigation regarding impact on teachers. Do teachers respond to such partnership initiatives differently as correlated with their years of teaching experience? There are some teachers who have already demonstrated high quality teaching; in what ways are their experiences with such partnership programs qualitatively different from less proficient teachers? Is it possible that arts partnership programs need to make accommodations for different profiles of teachers, providing a menu of professional development options that more clearly accommodate teachers' needs, interests and capacities? Is it also possible that such choice may in fact encourage continuous improvement even among the high quality teachers who are willing to take new risks to engage their students in different ways?

An investigation of the teachers demonstrating the four 'effects' noted above juxtaposed with the achievement of their students is worth exploring. Although this project design included tracking High, Average and Low Achieving students (HAL) through their participation in PAIR in grades 4,5,6, it is also worth considering the achievement of students who rotated through teachers' classrooms involved in the program more than one year. In other words, it may not be how many years the students were in the project, but rather how many years their teachers were PAIR teachers that contributes to student achievement. Anyone who has ever taught a class can attest to the value of additive expertise as one becomes more skilled and more comfortable with teaching a unit, concept or topic. It is possible that, when one or more of these project "effects" are in evidence in the teacher indicators, then their students will benefit, whether they have participated in PAIR for 1, 2, or all 3 years.

## Conclusions

- A. Hall and Hord’s ‘levels of use’ (2006) is a valuable framework to adopt in considering arts integration partnerships. Different teachers embrace innovations to varying degrees, based on a variety of variables, including their years in the profession, experience with external partnerships and exposure/access to the arts in their own lives and in their schools. Examining the levels of use of teachers engaged in new ventures over time and developing more fine-tuned measures to observe teachers’ movement from Nonuse to Use as Renewal and assist them to move more effectively toward that goal is a promising approach to Professional Development.

**Table Fifteen (repeated from above): Level of Use of An Innovation (Hall and Hord, 2006)**  
*(How do we know when an innovation has taken hold?)*

Users
<ul style="list-style-type: none"> <li>• Renewal</li> <li>• Integration</li> <li>• Refinement</li> <li>• Routine</li> <li>• Mechanical Use</li> </ul>
Nonusers
<ul style="list-style-type: none"> <li>• Preparation</li> <li>• Orientation</li> <li>• Nonuse</li> </ul>

- B. The PAIR project, by Year Three, was equipped to examine qualitative and quantitative measures in order to ascertain which teachers fully developed the project in their classrooms and which engaged in the project less completely. **The four “effects” posited in this report suggest certain elements that assist teachers in implementing an innovation:**
1. *The degree to which the teacher possesses pedagogical content knowledge (PCK) of the non-arts content field addressed by the innovation.* If teachers have limited PCK, then that must also be addressed in order to have full benefit from the innovation;
  2. *The degree to which the teacher learns how to document the project,* with particular attention to evidence of student learning through student products;
  3. *The degree to which the teacher engages in the project over the long term* and has ownership of choices with respect to goals, experiences, and assessments;

4. *The degree to which the teacher works in a school culture that embraces external resources and partnerships and rewards teachers for participation in them.*

We often ignore the effects of professional development on individual teachers. The results from PAIR suggest the error in doing so.

- C. *The PAIR design depended on teachers' ability to assess the non-arts content learning that was targeted by the arts integration projects.* Professional development specifically in meaningful classroom or grade level based assessment, would have not only served to enhance the project, but also would have been useful to teachers as they observed their students' integration of various art forms in their learning. District partnerships might focus specifically on support for assessment during an innovation provided by external partnerships in order to fully appreciate the value added of programs such as PAIR.
- D. It seems clear that the design of PAIR, in which a grade was added each year, was not as effective for teachers as it may have been for the cohorts of PAIR students. The 4th grade teachers, invested in the project for all three years, were the most affected by the PAIR project. Collaborative curriculum development that is replicable would be best served by engaging multiple grades at the same time, as teachers learn to work with arts integration as *vertical as well as horizontal learning* approaches for students.
- E. Ball and Cohen's reference to a "pedagogy of professional development" (1999) took on a new meaning in the PAIR project. Teachers began to reconceive of where they would learn and by what means they would learn about the benefits of arts integration in their classrooms. *Professional development, for PAIR teachers, came in the form of co-teaching with artists, observing artists working with their students, and revising the targeted curriculum to accommodate different kinds of learning that students were demonstrating.* "Workshops as professional development" are limited, but in-class co-teaching has great potential to influence practice, as this project demonstrated.
- F. Teachers change their practice only when they see that change makes a difference in what their students learn and how their students are engaged. *The evidence in PAIR shows clearly that the teachers saw their students learn the non-arts content differently.* They reported that the students were able to elaborate, *give me more of what I was looking for*, as one teacher phrased

it, and expand their ideas more fully due to the tools that the teaching artists provided in the classroom.

- G. Dissemination of changed practices and the impact of innovations such as this arts integration project require considerable planning and support. Schools are not designed to enable teachers to share what they know; the culture of schools are often not conducive to peer acceptance of such dissemination; teachers who hear about and view documentation from a project like PAIR are usually not compelled to do anything with it. What teachers *do* respond to is evidence of students' learning through students' products, narrated by those with strong pedagogical content knowledge from within the professional community. *Dissemination then must focus on actual products – and must be interpreted so that non-project teachers can see for themselves the value of taking the risk to engage in innovation outside of their expertise.* Dissemination did not happen as often as thoroughly in PAIR as it could. But the Magnet Cluster Schools have established a network that is conducive to such practices and could build upon the BCCLA and now the PAIR project among others to send the message that dissemination is crucial and is a necessary form of professional development for all teachers.
- H. The portfolio conferences, with three students and their teacher, are a promising initiative for research and for professional development purposes. While the “three-way conference” involving a parent, student, and teacher, is not new to educators, *the concept of having a teacher watch as her/his students discuss their learning with another adult is an interesting method of assessment* that could be used by teachers and researchers in various ways.
- I. The practice of collecting student work and then attaching Labels to those samples that document the teaching approach that resulted in that work is a difficult concept for teachers and takes some time to embed in their routines. The principle, however, is soundly research-based. The notion that we should be able to discuss what the teacher (or teaching artist) *did* with students that enabled students to produce a given work sample, and then learning from that insight to improve teaching the next time is crucial to continuous improvement. The categories considered as effective teaching practices within an integrative curriculum (See Table Twelve excerpted below) are representative of approaches that affect student achievement. Teachers not only reported enacting these practices more often as the project continued; they also documented those practices more often as well. The labels in the PAIR project began to be

most useful as documentation of teaching in the third year of the project. CAPE has seen the labels work to varying degrees in different projects, but it is clear that *the longer teachers have to experiment with the labels and perhaps have more ownership in what prompts should be on the labels, the more we are truly able to see into the classroom as a learning laboratory and understand what is behind the student work on the table.*

**Table Twelve (Excerpted): Effective Teaching Practices Documented on PAIR Student Work Labels**

Evidence of PAIR Teacher Impact based on Student Work Labels	Documented assessment	Documented students' co-creation of curriculum	Documented students teaching other students	Documented students teaching the teacher	Students participated in documentation and/or assessment	Students wrote inquiry questions	Students used new arts vocabulary
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- J. There was a relationship in the PAIR project between professional development attendance and other variables regarding impact of the program. Part of the rationale for that relationship, however, was in the design of the program, in which the 4<sup>th</sup> grade teachers began attending in Year One and many continued throughout the three years.
- K. There were clear relationships between the PAIR professional development sessions, the documentation of the project, and the expectations for meaningful arts integration within the schools. For teachers new to professional development, the CAPE projector directors have acknowledged the need early in the project for more intentional professional development on arts integration, using the Design Seminar model.
- L. Several of the PAIR professional development sessions across the four years engaged teachers and artists in conversation about preliminary research findings. This practice resulted in teachers' increased interest in results and in participating in the research with the research team. This is a common methodology for CAPE projects and continues to enhance the quality of the projects as participants see that the team is doing research *with*, not research *on* students and teachers.
- M. A meta-analysis by Robinson and Timperley (2007) examined seventeen studies of professional development initiatives that have made a demonstrable impact on the students of

the teachers involved to determine what kinds of leadership practices were involved in each initiative. The analysis revealed five leadership dimensions that were critical in fostering teacher and student learning: *providing educational direction; ensuring strategic alignment; creating a community that learns how to improve student success; engaging in constructive problem talk; and selecting and developing smart tools*. The PAIR project addressed all five of these dimensions through the professional development sessions and the project support team from CAPE and Chicago Public Schools. Further strategic alignment is possible across grades 4,5,6 with future initiatives if the design works toward vertical alignment – an important outcome of this project that the district can build upon. The “smart tools” are those embedded in all high quality arts integration initiatives; some were also specifically targeted as strategies in the Effective Teaching practices. Gathering, improving, and disseminating the PAIR “smart tools” (portfolio conference process, professional development assessment measuring levels of use of material addressed, student work labels to connect product with pedagogy) would be beneficial.

In the current educational climate, much has been made of the necessity of linking teacher evaluation with student achievement as measured by standardized test scores. The recent federal competitive initiative from the Department of Education termed “Race to the Top” is encouraging the developing of “data-driven systems” in states that are competing for federal funds. New York, which has been awarded nearly \$700 million, adopted a new teacher evaluation system that takes student test performance into account (*New York Times Editorial*, August 29, 2010). The challenge is of course how to determine the variables that contribute to student achievement and juxtapose those variables to the characteristics of teachers.

In a 2007 Data Quality Campaign document from the National Center for Educational Accountability, there were “10 essential elements of state longitudinal data systems” that were proposed (Bergner, Stein and Armstrong, 2007, p. 2) (See Table Thirty-Five).



**Table Thirty-Five: Data Quality Campaign: Advances in State Student Data Systems**

<b>10 Essential Elements of State Longitudinal Data Systems</b>
1. A unique statewide student identifier that connects student data across key databases across years.
2. Student-level enrollment, demographic and program participation information.
3. The ability to match individual student’s test records from year to year to measure academic growth.
4. Information on untested students and the reasons they were not tested.
<b>5. A teacher identifier system with the ability to match teachers to students.</b>
6. Student-level transcript information, including information on courses completed and grades earned.
7. Student-level college readiness test scores.
8. Student-level graduation and drop-out data.
9. The ability to match student records between the p-12 and post-secondary systems.
10. A state audit system assessing data quality, validity and reliability.

The only mention of teachers is in element #5, noting the need for a “teacher identifier system” with the ability to match teachers to students. The proposed data points track students at all levels and through different dimensions. The formula, however, misses essential elements regarding **what teachers are actually doing in the classroom** and **whether there are specific practices that teachers across grade levels are doing to contribute to the achievement information** called for in this Campaign and rewarded by the Race to the Top program.

Although the Data Quality Campaign’s system suggest the need to “identify which teacher preparation programs produce the teachers whose students have the most academic growth” (p.2), there is no mention in the proposed schema to identify the practices, strategies and approaches to learning that could be reinforced, replicated and restored in schools and classrooms where they are not as visible.

The PAIR project has had some success in helping teachers identify the effective teaching practices that emerge in arts integrated contexts and utilize them in their teaching. We have proposed a tentative and very preliminary “teacher identifier system” based on the goals of the PAIR project in general. The assumption is that involvement in PAIR has served as professional development for teachers who will use what they have learned to further contribute to their students’ understanding in non-arts content areas to varying degrees, based on a number of factors that contribute to teacher quality as PAIR teachers. The research indicates that it is possible to identify teachers who have learned from the innovation and increased their level of use of the practices inherent in integrative learning and teaching. Future research is needed on how best to support and effectively provide professional development for teachers at different levels and with different needs from external partnerships and innovations and then track teachers over multiple years to determine how, when, and how often effective practices are used. Only then can we truly link student achievement to teacher evaluation.

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