

The Impact of Professional Development Interventions on Teacher Learning in Arts Integration

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Introduction

This paper examines the impact of an arts integration professional development initiative, DREAM (**D**eveloping **R**eading **E**ducation with **A**rts **M**ethods). DREAM provides in-depth learning for classroom teachers in the integration of theatre and visual arts into their reading curriculum.

DREAM is a partnership between the San Diego County Office of Education, North County Professional Development Federation and California State University San Marcos (CSUSM) and is funded by an Arts in Education Model Development and Dissemination grant from the U.S. Department of Education. The DREAM project is an evolution of a successful teacher professional development program, SUAVE. SUAVE (Socios Unidos para Artes Via Educación - United Community for Arts in Education) was a coaching model of teacher professional development created at CSUSM, partnering classroom teachers with professional artists to learn how to integrate the arts into their classroom curriculum.

The investigation of best practices in arts integration, particularly in drama, has been highlighted by researchers as a useful and necessary resource for educators (Mages, 2008). The idea of arts integration as a methodology for improving student learning is rooted in the understanding that children have different modes of learning (Gallas, 1994; Gardner, 1993; Goldberg, 2006). In learning through the arts, students are able to work with information on multiple levels simultaneously, thus increasing their understanding and retention.

With this in mind, this paper examines two models of teacher professional development in arts integration. The decision to explore two models came from a very pragmatic question – what works best in teacher learning? The DREAM project asked this question during the planning phase. There were no immediate or obvious answers. Research provided hints but no

conclusive direction. The decision was made to add this investigation to the project and compare the results.

The DREAM staff chose two professional development models. One model was a stand-alone summer institute. The other model added on to the summer institute with one-on-one coaching throughout the school year.

Previous research found mixed results with these two professional development interventions. Coaching coupled with workshop training has been found to be successful in improving instruction (Batt, 2010; Rudd, Lambert, Satterwhite, & Smith, 2009). Some research suggests, however, that this combination does not lead to teacher retention of professional development learning (Goldschmidt & Phelps, 2009). Other research has shown that while coaching combined with institute training can improve instructional practice, the impact on student learning outcomes is more elusive (Garet, Cronen, Eaton, Kurki, Ludwig, Jones, et al., 2008).

Research Design and Methodology

Research Question

DREAM's purpose in investigating these different p.d. approaches is to identify possible best practices in preparing teachers to integrate theatre and visual arts in their classrooms to enhance student learning in reading. The research questions are as follows:

- Which professional development model increases teacher proficiencies in arts integration?
- Which professional development model improves student academic performance in reading comprehension?

Theoretical Framework

Laura Desimone's framework for teacher professional development was used to identify the necessary elements for effectiveness (Desimone, 2009). Desimone argues that there are five core features to effective professional development for teachers:

- *Content focus* highlights that the purpose of the professional development is to improve teachers' knowledge of subject matter content and to identify how children then learn that content.
- *Active learning* occurs when teachers are actively involved in meaningful discussion, planning and practice. This includes the opportunity to observe and be observed in utilizing new concepts and knowledge; planning how to use new curriculum and teaching methods in the classroom; and reviewing student work.
- *Coherence* highlights that professional development needs to be aligned with other expectations placed on teachers. Professional development needs to relate to content standards and assessment and it needs to build on teachers' previous knowledge.
- *Duration* is important as teachers need the appropriate number of hours over a period of time in order for professional development to be effective in improving teaching practice.
- *Collective participation* incorporates a collaborative, communal approach to professional development. Teachers from the same school or the same grade work together and create a more dynamic and engaged learning community.

Study Design

Teachers were first recruited for the study during the school year (2008-09) prior to the first summer institute. To be eligible, participants had to teach third or fourth grade in a participating district at an elementary school with a population of students at least 35% of whom

qualified for free or reduced lunch. The 120 teachers who volunteered to participate were stratified by grade level. Once stratified, teachers were randomly assigned via lottery to one of three research groups.

- A. Coaching Group: 25 teachers were assigned to this group and they attended the 2009 summer institute which was 30 p.d. hours. Seventeen teachers remained in this group at the start of the school year (eight were reassigned by their districts to other grades or ineligible schools.). There was no attrition from this group during the year. They also received on average 25 hours of instructional arts coaching during the school year. Teachers received a stipend for attending the summer institute but not for the coaching.
- B. Institute-only Group: 25 teachers were assigned to this group and they attended the 2009 summer institute for 30 p.d. hours but received no coaching support during the school year. Eighteen remained in this group at the start of the school year (six were reassigned by their districts and one left for maternity leave.). One withdrew during the year. Teachers received a stipend for attending the summer institute.
- C. Control Group: Initially, 70 teachers were assigned to the control group. They did not participate in the 2009 summer institute or receive coaching. Due to teacher layoffs and reassignment by districts, this number was reduced to 33 by the start of the school year.

Study Participants

To confirm that the research groups are statistically similar, all study teachers took a demographic pre-test about their own education and teaching experience. Other research has found these factors to be influential in student success. Insuring the randomly assigned groups

are similar in these factors eliminates the possibility of other variables conflicting with the intervention (Coalition for Evidence-Based Policy, 2005).

One-way ANOVAs were used to identify any statistically significant differences between study groups and no differences between study groups were found for teachers' level of educational attainment, total years of teaching, years teaching at current grade level or prior arts professional development. Table 1 highlights these variables for each of the study groups.

Table 1

Study Group Demographics

	Coached group	Institute-only group	Control group
Average years teaching	15 years	13 years	13.9 years
Average years teaching current grade	7 years	6.5 years	5.6 years
Average education attainment	Work towards master's degree	Work towards master's degree	Work towards master's degree
Percent who had prior arts p.d.	52%	40%	28%

Data Sources

In order to provide strong evidence of the project impact, an experimental design with a stratified random sample was being utilized for this study. In addition, qualitative methods were used to complement the formative component of this project. This “embedding” of qualitative methods into a quantitative design allows greater dimension to the research without compromising the integrity of the experimental design (Creswell & Plano, 2007).

Table 2 below describes the data collection instruments for the first year of the intervention.

Table 2

Data Sources from the 2009/10 Intervention Year

Instrument	Description	Study group
Pre-test/post-test survey <i>Administered spring 2009 & 2010.</i>	Collected demographic data, and measures about teacher knowledge and confidence in arts instruction, arts state standards and arts integration as well as frequency of arts integration.	<ul style="list-style-type: none"> • Coaching group • Institute-only group • Control group
Post-institute survey <i>Administered June 2009</i>	Assessed teacher knowledge and confidence in arts instruction, arts state standards, arts integration and institute feedback.	<ul style="list-style-type: none"> • Coaching group • Institute-only group
Lesson plan work samples <i>December 2009 & March 2010</i>	Arts integration lesson used in reading instruction.	<ul style="list-style-type: none"> • Coaching group • Institute-only group
Focus groups <i>January 2010</i>	Examined impact of intervention on teaching practice and student learning. Provided formative evaluation data as well.	<ul style="list-style-type: none"> • Coaching group • Institute-only group
California Standards Test Language Arts test and Reading Comprehension subscale. <i>Testing in April/May 2010</i>	Reading comprehension	<ul style="list-style-type: none"> • Coaching group • Institute-only group • Control group
Follow-up survey <i>February 2011 (year after intervention)</i>	Collected data about teacher confidence in arts integration as well as frequency of arts integration.	<ul style="list-style-type: none"> • Coaching group • Institute-only group

Data Analysis

Data were analyzed to determine the impacts of the intervention on teacher practice as well as student learning in reading. The data analysis process utilized multiple regression

analysis, one-way ANOVAs and t-tests to determine the significance of differences between groups. Descriptive statistics were also used for quantitative data. Descriptive and content analysis were used with qualitative data. The teacher surveys and interviews were examined for themes and patterns. Triangulation across different methods was used to confirm findings.

Findings

Findings strongly suggest that the coaching intervention appears to have made the most impact on teacher confidence and use of arts integration. The impact on improved student performance in reading was not as clear.

Which Professional Development Model Increases Teacher Proficiencies in Arts

Integration?

Our findings suggest that the coaching model had a greater impact on teacher proficiencies during the intervention and was better sustained after the intervention. Coached teachers reported greater confidence integrating the arts, produced higher-quality work samples and used arts integration more frequently than did the institute-only teachers or the control group teachers. Coached teachers also had additional resources emerge during the coaching to help support them.

Teacher Confidence in Arts Integration

Confidence in integrating the arts in general was, on average, higher at the end of the treatment year for the coaching group than the institute-only group or the control group. At the start of the year, there was no statistically significant difference found between study groups on the pretest's confidence measures using a one-way ANOVA. However, an independent t-test was used to compare the overall year-end confidence of the treatment groups. The analysis produced a significant t value ($t_{(29)} = 2.200, p < .05$). An examination of means shows that, on a

scale of 1-4, with 4 indicating most confident, the coaching group had a higher score on overall confidence in integrating the arts at the end of the school year ($M=3.29$) than did the institute-only group ($M=2.79$). The control group's mean was the lowest at 2.48.

Confidence Integrating Theatre. An independent t-test was used to compare the two treatment groups in their overall confidence in theatre integration. At the start of the year, there was no statistically significant difference found between study groups on the pretest using a one-way ANOVA. The year-end analysis produced a significant t value ($t_{(29)} = 2.638, p < .05$). An examination of means shows that, on a scale of 1-4, with 4 indicating most confident, the coaching group had a higher posttest score in their confidence integrating theatre ($M=3.12$) than did the institute-only group ($M=2.43$).

Confidence Integrating Visual Art. Institute-only teachers ended the year with slightly higher confidence integrating visual arts than the coached teachers, although this difference between groups was not statistically significant.

Interestingly, coached teachers reported greater confidence on the pre-test ($M=2.76$) than the institute-only teachers ($M=2.20$). On this particular measure, the institute-only teachers made greater gains than did the coached teachers. This growth may be related to prior arts p.d. The institute-only teachers reported receiving much more p.d. in visual arts prior to the summer institute than did coached teachers.

Participant Work Samples

The teacher work samples suggest that the coaching intervention had a greater impact on teachers. On average, the coached teachers scored higher on the lesson plans than the institute-only teachers. On average, the coached teachers made improvement in their second lesson plans over their first in several areas. The second lesson plans were, on average, better aligned to the

lesson plan goal and were more inclusive of reading instruction (rather than being primarily arts-focused). The institute-only teachers did not make any significant improvements on any of the criteria between the first and second lesson plan.

Frequency of Arts Integration

Over the course of the year, the coached teachers were integrating the arts more frequently than either the institute-only teachers or the control group teachers. At the start of the year, there was no statistically significant difference for frequency found between study groups on the pretest using a one-way ANOVA.

Coached teachers reported a significant increase in the frequency of arts integration over the course of the school year. Project staff considered "once a week" to be the baseline in terms of measurable impact.

Table 3

Percentage of Teachers Integrating the Arts at Least Once a Week.

	Coached teachers	Institute-only teachers	Control group teachers
Pretest	53%	35%	48%
Post-test	89%	50%	44%

On the pretest there was no statistically significant difference found between study groups using a one-way ANOVA, so they were considered equal in research terms. An independent t-test was used to compare the frequency of arts integration at year end of the two treatment groups. The analysis produced a significant t value ($t_{(29)} = 3.073$, $p < .01$). Teachers indicated their frequency on a scale of 1-5, with 5 being most frequent (daily) and 1 being least

frequent (yearly). An examination of means shows that, on a scale of 1-5, the coaching group had a higher frequency score ($M=4.12$) than did the institute-only group ($M=3.43$).

Availability of Support and Resources

The institute-only teachers reported in focus groups and on surveys some key problems in successfully implementing the methods. These challenges included:

- The lack of resources in general in public education had specific impact on the DREAM teachers. Schools and/or districts no longer would provide art supplies and, due to the low-income status of the participating schools, many teachers felt that parents could not be asked to provide financial support. While nearly every teacher wanted to use visual arts, the cost of materials was prohibitive to some. One teacher noted that she integrated theatre rather than visual art because it required no supplies. Another teacher reported that she taught directed drawing because it only required pencils and paper, which were available in her classroom. Coached teachers did not face these challenges to the same extent as their art coaches would often provide or help the teacher identify resources or “work-arounds”.
- The lack of consistent administrator support was also an issue. Institute-only teachers reported that their principal did not know about the project or their participation. One institute-only teacher reported that her principal specifically forbade her from integrating the arts during language arts. Other teachers reported being discouraged to use integration by their principals. The coaching teachers appeared to have a slightly easier time of this. The coaches' practice of meeting the principals appears to have helped tremendously in gaining support. One teacher reported that her coach's interactions with the principal significantly eased the way for her use of arts integration.

- Very limited time to integrate the arts. The treatment teachers all had a pacing guide tied to their reading text. The institute-only teachers reported the need for more curriculum planning during the summer institute. They had to figure out on their own how to connect the professional development to the curriculum, whereas the coached teachers had support from their coach for that. The weekly presence of the coach also held the coached teachers accountable for using the methods.

Impact beyond the Intervention

All treatment teachers were invited to complete a survey in February of the year following the intervention year. Sixteen responded, ten from the coaching group (59%) and six from the institute-only group (35%). Teachers were asked to report on how they were using the arts integration methods they had learned and to what extent. In addition, teachers were asked to describe their observations of the impact on student learning.

Participant confidence in arts integration – post intervention. Confidence in integrating the arts was, on average, higher for both treatment groups at the end of the intervention year than at the mid-year point post-intervention. In the year following the intervention, the coached group had greater confidence in integrating theatre and visual art than did the institute-only group.

Confidence in integrating the arts changed for both treatment groups during the year following the intervention. For the coaching group, their confidence in integrating both theater and visual arts dropped but only the drop in theater was statistically significant. A t-test was used to compare the coaching group's treatment-year-end confidence with the follow-up year's confidence level. The analysis produced a significant t value ($t_{(8)} = 3.500, p < .01$). An examination of means shows that, on a scale of 1-4, with 4 indicating most confident, the sample

of coaching group teachers had a higher score on overall confidence in integrating theatre at the end of the intervention ($M=3.56$) than they did in the school year following ($M=2.78$). In addition, this sample of coached teachers dropped slightly in confidence in integrating visual art from a mean of 3.78 to a mean of 3.22. However, this difference was not statistically significant.

The institute-only teachers also demonstrated a statistically significant decline in confidence for integrating theatre in the subsequent year. Using a t-test, analysis produced a significant t value ($t_{(5)} = 5.000, p < .01$) for confidence in theatre integration. Like the coaching group, the institute-only teacher sample reported a drop in confidence which was not statistically significant.

Frequency of arts integration – post-intervention. The coached teachers were integrating the arts more frequently than the institute-only teachers. Both treatment groups' use of integration was reduced in the post-intervention year but neither drop was statistically significant when analyzed with a t-test.

Predicting sustained use of arts integration post-intervention. Using multiple regression analysis our analysis found two variables that predicted continued integration of the arts beyond the treatment year. Teacher confidence in theatre and visual art predicted continued use of the integration methods. Higher confidence integrating theatre mattered at the end of the treatment year whereas higher confidence integrating visual art was important in the year following the intervention. There was no between-group difference in treatment groups.

Table 4

Estimated Coefficients and Levels of Significance for the Continued Use of Arts Integration Beyond the Treatment Year using Multiple Regression

Independent variables	Treatment teachers
Teacher-reported confidence integrating theatre into reading curriculum at the end of the treatment year	.376**
Teacher-reported confidence integrating visual art into reading curriculum midyear in the follow-up year.	.687***
R ²	.881

Note. *p< .05; **p<.01; ***p<.001; only statistically significant scores were reported.

Which Professional Development Model Improves Student Academic Performance in Reading Comprehension?

Differences in student outcomes were not as apparent as teacher outcomes. Teacher-reported outcomes were very positive. Mean scores on the state language arts test did not show a statistically significant difference between groups. However, multiple regression analysis points to arts integration as a positive factor in third grade language arts test scores.

Teacher-reported Student Outcomes

When asked about what they observed about their students when using arts integration, over half the responding teachers on the year-end survey described their students as more engaged and enthusiastic about learning. Significantly, they observed deeper learning in the core

curriculum was demonstrated through arts integration and student confidence in reading was higher.

Table 5

Survey Question: What Did You Observe About Your Students When Using DREAM Methods?

Teacher response	Percentage of responses
Higher student engagement and enthusiasm for learning	53%
Deeper learning in and better retention of core curriculum	20%
Higher student confidence	16%
Improved social skills	4%
Improved attendance	2%
Some students do not like art and won't try	2%
Students hesitate in theatre because I am unsure	2%

Table 6

Survey Question: In What Specific Ways Did The DREAM Methods Help You Teach Reading?

Teacher response	Percentage of responses
Students developed greater understanding of reading elements including plot, character, inference, setting, etc.	48%
Students demonstrated improved reading comprehension	28%
Students demonstrated greater vocabulary acquisition	25%

State Language Arts Test Scores.

While the treatment group students did have a higher mean score on the state standardized language arts test at the end of the intervention year, they also had a higher mean score on the pretest (the standardized test score for the prior school year). The treatment group mean score on the “pre-test” was 3.5% higher than the control group and 2.5% higher on the “post-test” at the end of the intervention year.

Table 7

CST ELA Mean Scores

Study group	Pre-test mean score	Post-test mean score
Treatment classrooms (n = 761)	348	354
Control group classroom (n=646)	337	345

This difference between groups was found to be statistically significant for both the pretest and the post-test. An independent samples t-test was calculated to compare differences in the state Language Arts scores of treatment students with control group students. For the pretest, the analysis produced a significant value of ($t_{(1405)} = -3.463, p < .01$). For the post-test, the analysis produced a significant t value ($t_{(1405)} = -2.579, p < .05$).

State Language Arts Test - Reading Comprehension Subscale.

The treatment students (n= 852) had a mean score of 66% while the control group students (n= 720) had a mean score of 63%. This was not found to be a statistically significant difference.

Regression Analysis of Student Test Scores and Teacher Variables

Multiple regression analysis was conducted using student test scores and related teacher variables to examine any predictive relationships.

English language arts state test scores for treatment and control groups. Multiple regression analysis was conducted to examine predictors for the English Language Arts test score on the California state standards test (CST). Six statistically significant variables were identified in the model for fourth grade and four variables were identified for third grade. These variables accounted for 84.7% of fourth grade CST scores and 81.9% of third grade scores. The strongest positive predictors of this score for Fourth grade were the reading comprehension subscale score and the fourth grade teacher's score on the fall lesson plan. The strongest positive predictors of this score for third grade were the reading comprehension subscale score and the frequency with which third grade teachers integrated the arts.

The strongest predictors that were negatively associated with this response were the frequency with which fourth grade teachers integrated the arts and if theatre was the art form used most frequently in the classroom. There were no predictors with negative associations for third grade.

Treatment and control groups were analyzed together and the study group assignment was not a statistically significant predictor. However, regardless of grouping, arts integration was a strong predictor among third graders in higher ELA test scores.

The study groups were equivalent on the pre-test. No statistically significant difference was found between control and treatment groups on the 2009 ELA scores, using independent samples t-test.

Table 8

Estimated Coefficients and Levels of Significance for the 2010 CST English Language Arts scores using Multiple Regression

Independent variables	Third grade (treatment & control)	Fourth grade (treatment & control)
CST ELA score from prior year (2009)	.363***	.202***
Reading comprehension subscale score	114.298***	143.205***
CST math scale score from 2010	.202***	.199***
Teacher's frequency of arts integration in 2009/10	3.260**	-4.062*
Teacher used theatre most frequently of all arts	Not statistically significant	-7.000*
Fall 2009 lesson plan score	Not statistically significant	.501*
R ²	.819	.847

Note. *p< .05; **p<.01; ***p<.001; only statistically significant scores were reported.

Discussion

In returning to the original question asked by the DREAM staff, “Which p.d. model works best?” the evidence here leads us to the institute/coaching combination. The coaching intervention appears to have had a deeper impact on teacher practice and attitudes. The evidence suggests that the summer institute was able to reinforce and reactivate teachers' prior arts skills and knowledge. The coaching intervention, however, appears to have honed new skills and knowledge and insured their application.

Teacher Outcomes

Changes in practice. There were significant disparities in the progress made between the coached teachers and the institute-only teachers. The institute-only teachers self-reported that they were able to make progress towards changing their practice but it was small, particularly in comparison to the coached teachers. The institute-only teachers had reported the highest levels of prior p.d. in visual art and they ended the year with greater confidence in this area than the coached teachers. However, the coached teachers made greater gains in this area over the year and nearly matched the institute-only group by the end. There were no instances of the institute-only teachers making this kind of gain.

The coached teachers overall reported and demonstrated that they made significant changes in their practice. There were unexpected supports provided by the coaches that emerged during the school that contributed to this change - art supplies and/or solutions, administrator support and connection to the reading curriculum.

Dosage. The length of the intervention may also play a critical role in changing teacher practice. Coached teachers received almost twice the professional development hours as the institute-only teachers. Not surprisingly, coached teachers integrated the arts more frequently

than the other teachers in the study. Dosage may be a crucial element in teacher learning in areas, such as the arts, in which they have minimal prior education or experience. This finding is supported by recent research that teacher professional development needs to be at minimum nearly 50 hours and sustained over a significant period of time (Darling-Hammond, Chung Wei, Andree, Richardson & Orphanos, 2009).

Sustaining the practice. The coaching/institute combination appears to have been better sustained in the year following the intervention. Midway through the following school year coached teachers reported greater confidence and more frequent use of arts integration than the institute-only teachers. As other research has suggested that teacher learning from professional development is difficult to sustain, the continuation of arts integration by the treatment group teachers suggests that this particular intervention had some success. That said, these findings should be examined with care. The follow-up year sample may not be representative of the entire pool of treatment teachers and sustained implementation may not be to the extent it was reported here.

Student Outcomes

State language arts test scores. Student outcomes provided some mixed findings. While students in the two treatment group and the control group showed little difference in mean scores on the state standardized test, it should be noted that there were no negative consequences to test scores when the arts were incorporated into the curriculum. Indeed our multiple regression analysis does suggest that greater frequency of arts integration third grade teachers (regardless of the treatment group) had a positive impact on students' language arts test scores. The presence of the arts did not detract from student achievement. Rather, they appear to have

contributed in ways undetected by state tests. This finding could suggest that the current practice to eliminate the arts from public education makes little to no sense.

Evidence of learning beyond testing. Even without a significant move in test scores, the inclusion of the arts was greatly beneficial in other ways for students. The treatment teachers were extremely enthusiastic about the impact of arts integration on student reading. Every treatment teacher reported at the year's end that arts integration was an effective teaching strategy for reading comprehension. Among many benefits, teachers reported during the treatment and follow-up years that their students demonstrated higher student engagement and enthusiasm for learning, better retention of curriculum, more creative participation and more self-reflection when utilizing arts integration. These qualities, which enhance classroom environments for learning, are not measured by any state's standardized test.

In conclusion, the findings contribute a growing body of research that depth and breadth matter when teachers tackle learning in new areas. A supportive coach appears to be important to the learning, particularly one who can provide not only content expertise but also intangible resources that allow the new practice to take shape. Shedding light on professional development approaches in arts integration offers the possibility of rich data not only for those interested in arts integration but in other areas of teacher professional development.

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