The Effect of Drama-based Pedagogies on K-12 Literacy-Related Outcomes: A Meta-Analysis of 30 Years of Research

(working paper)

Bridget Kiger Lee, PhD
Patricia Enciso, PhD
Megan Brown

Author Note

Bridget Kiger Lee*, Department of Teaching and Learning, The Ohio State University; Megan Brown, Department of Teaching and Learning, The Ohio State University; Patricia Enciso, Department of Teaching and Learning, The Ohio State University.

*All work for this manuscript was conducted while at The Ohio State University; however, Dr. Lee is now affiliated with the University of Pittsburgh. Correspondence concerning this article should be addressed to Bridget Kiger Lee; Email: bridgetkigerlee@gmail.com

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A recent national report heartily supported arts integration as an effective, innovative, and cost efficient way to address teachers' and students' needs; however, the report called for a better understanding of when, for whom, and what content areas are best served by arts integration methods. The effectiveness of drama-based pedagogy (DBP), a type of arts integration, has been assessed in previous meta-analyses; however, an updated meta-analysis is warranted. In the present report, we review and meta-analyze thirty years of accumulated research of the effects of drama-based pedagogies on literacy related student outcomes. The findings show a significant positive effect of DBP on achievement, attitudes, 21st century skills, drama skills, and motivation. In particular, effects are more positive when DBP is led by a classroom teacher over multiple hours of instruction. Limitations and implications are discussed.
Keywords: drama; meta-analysis; literacy

1.1 *Introduction*

While several meta-analyses have been completed over the past three decades focusing on the relationship between drama-based pedagogy and learning, they have not focused specifically on the relationship between drama and literacy outcomes across early, middle, and secondary students. Furthermore, overviews of research findings for drama-based pedagogy and learning have provided general theories of learning and motivation to support the relationship between drama-based pedagogy and academic achievement but have not focused specifically on theories of literacy learning and their relationship to drama-based pedagogy. Past analyses of the role of drama-based pedagogy in learning have shown that DBP contributes significantly to gains in literacy achievement; however, no analyses have specifically addressed a nuanced understanding of how and/or why this significant positive effect in achievement is present.

In this review, we respond to the following questions:

(1) What does the cumulative research suggest regarding the impact of drama-based pedagogy on student outcomes in literacy including academic outcomes and other related outcomes such as psychosocial functioning and 21st century skills?

(2) Do characteristics of the intervention, students, or outcome influence the magnitude or direction of the effect of drama-based pedagogies?

(3) What theoretical lenses might be especially useful for interpreting the findings from this research and for directing future research on the relationship between drama-based pedagogy and literacy learning?

1.1.1 Defining Drama-Based Pedagogy

Drama-based pedagogy (DBP) uses active and dramatic approaches to engage students in academic, affective, and aesthetic learning through dialogic meaning-making in all areas of the curriculum (Dawson & Lee, 2018). As DBP is operationalized in the K-12 classroom, the teacher and/or teaching artist leads students through well-crafted learning experiences that use various drama-based teaching and learning approaches, e.g., theatre games, image work, role-play, etc. (For a full description of drama-based pedagogy practices, see Dawson & Lee, 2018). It is important to note that DBP focuses on the process and pedagogical approach to how students learn and engage with concepts and skills rather than the final product or theatrical outcome. In particular, DBP learning experiences should include 1) some way for students to embody their learning, 2) a narrative for students to explore either individually or as a collective, and 3) moments (short or extended) when students are using their imaginations. Unfortunately, these up-close features are poorly indicated and described in research on DBP, therefore we have established more concretized and broad defining features for this review. 1) DBP is facilitated and directed by a classroom teacher, teaching artist, and/or other facilitator trained in DBP, 2) DBP works towards academic and/or other academic related outcomes for the students involved, 3) DBP focuses on a process-oriented and reflective experience, and 4) DBP draws from a range of theatre/drama approaches.

Researchers and practitioners have diversely referred to forms of DBP as creative drama (McCaslin, 1996), story dramatization (Ward, 1986), process drama (Heathcote & Bolton, 1995), drama-in-education (Bolton, Davis, & Lawrence, 1987), theatre of the oppressed (Boal, 1974), applied theatre techniques (Dawson, Cawthon & Baker, 2011), theatre games (Spolin, 1986), enactment strategies (Willhelm, 2002), improvisation (Johnstone, 1994), and role playing (O'Neill, 1995). Although slightly different in their application in the classroom, all of these

related terms adhere to the defining features we outlined for this review. However, there is also an assortment of terms that describe drama activities that would not be considered drama-based pedagogy as we have defined it for this review, though they are likely to be confused with it. These include: dramatic or pretend play, theatre for young audiences, and drama therapy. These concepts and related themes are outside the scope of this meta-analysis.

1.1.2 Defining Literacy Learning

The present meta-analysis is concerned with accounting for teachers' and/or teaching artists' mobilization of dramatic arts through drama-based pedagogy in support of children's literacy learning. Given the similarities between drama and literacy (e.g., character development and focus on language), it seems reasonable to suggest that drama would contribute to students' insights about characters, thematic understanding, complex language and nuance, as well as their enjoyment of and persistence with interpreting and creating stories. Indeed, literacy scholars, theatre arts educators, theatre artists and literacy educators have argued for the value of drama in literacy education (Berry, 2001; Crumple, 2006; O'Neill, 1995; Podlozny, 2000; RSC, 2011; Wagner, 1998).

Literacy is important in all classroom interactions because teachers and students rely on language (Bloome, 1983; Cazden 2001; Heath, 1983; Wortham, 2006), reading (Cervetti & Pearson, 2012; Moje, Overby, Tysvaer, & Morris, 2008; Street, 1997), writing (Campano, 2007; Collins & Blot, 2003; Dyson, 1993;Willis, 1995) as well as personal and subject-specific oral storytelling and dialogue (Applebee, Langer, Nystrand & Gamoran 2003; Juzwik, Borsheim-Black, Caughlan & Heintz, 2013) to navigate meaning in nearly every subject area. Through text and talk, teachers and students inquire into and interpret new ideas as they extend their understandings of the world. In this sense, literacy is not a set of universal skills but rather a set

of practices, developed overtime to direct attention to and relationships among people and ideas.

Teacher-led discussions are one of the most widely studied and widely used literacy practices in education. As described by Mehan (1998), discussions usually rely on a pattern of teacher-initiated questions, student responses, and teacher evaluations (IRE) based on the assumption that when a teacher asks a question, students will respond with clearly stated propositions, based in textual evidence; and when the student's response is not clearly stated or incorrect, the teacher's evaluation corrects or redirects to the teacher's anticipated answer. This discussion format not only establishes the teacher's control of meaning but also constructs power relations between teachers and students and among students, such that students may be positioned as inadequate or disinterested contributors to both the learning event and the social group (Bloome & Egan Robertson, 1993; Lewis, 2001).

When talk and texts are controlled by only a few classroom participants, many students will be left on the periphery of active inquiry and understanding (Edmiston, 2003; Wolf, 1998). Furthermore, students' responses in class may not be recognizable as legitimate or meaningful because youth languages and interpretive referents are formed in a dynamic relationship with youth's multilingual and multiethnic communities, youth culture, social media, world events, and contemporary art forms. Thus, when teachers rely solely on talk and discussion to guide the interpretation of a narrative or concept, they are less likely to fully access or understand students' meaning (Edmiston, 2013; Medina, 2004).

In response to the challenges posed by longstanding IRE patterns of talk-dominant learning, literacy scholars have argued that youth ideas and interpretations will become more visible and available for shared negotiation when teachers implement lessons using multiple

modes of expression (Edmiston, 2013; Kress, 2003; Vygotsky, 1978;). As a classroom-based art form, drama-based pedagogy invites students to use active, embodied, relational, and spatial modes of exploration and expression, within a shared imagined context. An imagined world can be inspired by a story or concept, and created with embodied representations of characters or story elements; making it possible for teachers and students to actually see and feel the story world in 'real-time' so that everyone might focus on a shared representation and its potential meaning. In addition to creating a shared focus, drama-based pedagogy also introduces new relations of power and authority in classrooms so that multiple participants may assert possible meanings, thus disrupting students' expectations of IRE discussion patterns while inviting more students to represent meaningful images and references. Students are given the opportunity to question, adapt and create their own comprehension and meaning within the literacy event that may connect with or subvert other's literacy understandings (Johnston, 2012).

1.1.3 Drama-Based Pedagogy and Literacy Research

Broadly, DBP has been theorized to be an effective instructional approach likely to enhance achievement and other adaptive student outcomes compared to traditional instruction, in part, because it aligns with social cultural ideas for learning (Edmiston, 2013). In particular, facilitators rely upon this understanding of the learners, scaffold the learning, and co-construct meaning through dialectical interactions with others and the environment (Vygotsky, 1978). Through engagement in DBP, students are able to make their knowledge and perspectives visible and available as they learn to comprehend and write about complex texts (Edmiston, 2014; Berry, 2008; Cushman, 2011; Edmiston & Enciso, 2002; Wagner, 1998; Wolf, 1994). Recent research suggests that using DBP with literary and informational texts both challenge and support students as they examine details in texts (Kidd, 2011; Gallas & Smagorinsky, 2002),

infer and evaluate possible meanings (Smagorinsky & Coppock, 1995; Edmiston & McKibben, 2011), and synthesize perspectives (Crumpler, 2006; , 1995). All of these ways of thinking about texts are vital for deep comprehension and motivation for continued reading (Ivey & Broaddus, 2001; Olson & Land, 2007).

The effectiveness of DBP was assessed in one comprehensive meta-analysis (Lee, Patall, Cawthon & Steingut, 2014) and 1986 (Kardash & Wright) and three more limited meta-analyses in 1992 (Conrad) and 2000 (Conrad & Asher; Podlozny). In the 2014 and 1986 studies, the study included a broad review of all outcomes related to academics in general. The data suggests that DBP has a positive, significant effect on student outcomes related to literacy; however, because of the inclusion of *all* academic outcomes (i.e., math, social studies, science, etc.), the studies were unable to specifically address the unique review and analysis of literacy outcomes. These broad investigations of DBP help us understand a constellation of outcomes; however, the details of a specific content area (i.e., literacy) is limited by the reach of the research and the space allocation in the journal. Additionally, these previous analyses did not address literacy specific theory and research as part of their review.

In 2000, Podlozny conducted a focused inquiry on literacy and drama-based work. However, Podlozny included a broad range of pedagogies (i.e., thematic fantasy play, dramatic play) that traditionally have not been included in drama-based pedagogies during which learning experiences tend to be more directed by a facilitator (classroom teacher and/or teaching artist). Additionally, the literature on the effects of drama-based pedagogies on student's academic achievement and related academic outcomes has grown since this literacy-focused meta-analysis. Upon an initial search of studies focused on the effects of DBP on literacy outcomes in educational settings since 1999 (last search date by Podlozny), we identified 16 new studies for a

total of 42 research reports since 1985 with over 200 effect size estimates. This focused inquiry on DBP and literacy allows for a nuanced and deeper understanding of DBP effects. Through the following analysis, we focus our attention on the qualitative review and the quantitative moderator analyses that may shed light on the ways that DBP can be used to the greatest benefit of student's literacy outcomes.

1.1.4 Methods

Various past efforts inform this work: research reviews of DBP (Deasy, 2002) as well as previous meta-analyses of the effects of DBP on various student outcomes (Lee et. al, 2014; Conrad, 1992; Kardash & Wright, 1986; Podlozny, 2000). Research syntheses and quantitative meta-analysis primarily focus on empirical studies and seek to summarize past research by drawing overall conclusions from multiple, separate investigations that address related or identical topics (Cooper, Hedges, & Valentine, 2009). In so doing, the present study employs meta-analysis techniques that provide clarity and direction for what the research in DBP supports, does not support, and suggests for future lines of research.

1.1.5 Study/Data Inclusion Criteria and Search Strategies

For a primary study to be included in this research synthesis, several criteria had to be met. Most importantly, each study had to assess in some way the relationship between DBP as defined earlier and a student outcome in literacy, including academic achievement, attitudes toward academics or another measure of student psychosocial functioning, such as motivation within a literacy related intervention. The studies included in the meta-analysis must all be experiments or quasi-experiments with at least one experimental and one control group. Only studies conducted in educational settings during school hours with preschool through college students were included. We only included samples of students who are typically developing as indicated by the researchers of the study. Although many studies suggested such labels like "at-

risk" or "underachieving", we did not exclude these studies based on this label. If the researchers did not give a clear statement about the student samples and their educational, emotional, and/or behavioral development, we assumed students were typically developing. In addition, only studies with samples from the United States, Canada, United Kingdom, and Australia were included due to similarity in schooling and shared dominant language. Finally, enough information had to be provided in order to calculate an effect size.

Using a broad set of search strategies, we attempted to identify and retrieve the entire population of published and unpublished studies that examined the relationship between drama-based pedagogy and student literacy outcomes dating back to the first major review of the literature (Kardash & Wright, 1986). We followed the recommendation of Cooper, Hedges, and Valentine (2009) to include all relevant studies independent of their publication status (e.g., peer-reviewed journal, evaluation reports, dissertations, unpublished data, etc.). To that end, we used the following strategies: 1) We searched databases specific to psychology, education, and the arts as well as broad databases for academic work using each of the following keywords

Drama* OR Theat* OR Improvis* OR Arts Integration AND Education;

2) We conducted a hand-search of relevant journals; 3) We used *Social Sciences Citation Index* database for documents cited by previous meta-analyses or seminal literacy and drama research; and 4) We searched advocacy and research websites affiliated with the arts and education.

Next, we employed four strategies to directly contact researchers who have studied drama-based pedagogy: 1) productive researchers, 2) the directors of research in educational regional labs, 3) recipients of grants from Department of Education Arts and Education Model and Dissemination and the National Endowment for the Arts, and 4) authors found in the reference sections of relevant documents. Titles and abstracts for each document were examined

by the first author and any article that mentioned assessing the effects of drama-based pedagogy (or its other potential names) was retained.

1.1.6 Information Retrieved from Primary Research

Numerous characteristics of each study were collected to create the database. The following is not a comprehensive coding guide, but outlines the general categories for coding each study.

1.1.7 Data analyses

Coder reliability. Two trained coders extracted information from all reports selected for inclusion. All discrepancies were resolved by a third coder.

Effect size estimation. As part of the meta-analysis procedures, we calculated the standardized mean difference or the *d*-index (Cohen, 1988) to estimate effects. In this synthesis, we subtracted the control condition post-intervention outcome mean from the DBP intervention condition post-intervention outcome mean and divided the difference by their pooled standard deviation. Thus, positive effect sizes indicate that students who received DBP had more positive outcomes than students who did not receive DBP. When necessary, the appropriate changes were made to code all outcomes such that a positive outcome was better (e.g., absences, bullying behaviors, etc.). When available, we calculated effect sizes based on the means and standard deviations of the student outcomes. If means and standard deviations were not available, we retrieved the information needed to calculate *d*-indexes indirectly from inferential statistics (see Borenstein, 2009; Lipsey & Wilson, 2000). In addition to retrieving or computing unadjusted post-intervention effect sizes, effect sizes that adjusted or controlled for the outcome variable prior to intervention were also retrieved or calculated if the information was available.

Methods of data integration. First, the distribution of effect sizes and sample sizes was

examined to determine if any were statistical outliers. Grubbs (1950) test was applied. If outliers were identified, these values were set at the value of their next nearest neighbor of an independent sample. Additionally, we tested for possible publication bias and missing reports using Duval and Tweedie's (2000a, 2000b) trim and fill procedure. This test estimates the potential impact of missing reports on the observed average effect by imputing the "missing" values necessary to achieve a normal distribution.

We used inverse-variance weighted procedures to calculate average effect sizes across all comparisons (Borenstein, Hedges, Higgins, & Rothstein, 2005). Also, 95% confidence intervals were calculated for average effects. If the confidence interval did not contain zero, then the null hypothesis of DBP v. non-DBP difference was rejected.

Possible moderators (e.g. grade level, duration of the treatment, etc.) of the relationship between drama-based pedagogy and student literacy or literacy-related outcome were tested using homogeneity analyses (Cooper, et al., 2009; Hedges & Olkin, 1985). The analyses was carried out to determine whether (a) the variance in a group of individual effect sizes varied more than predicted by sampling error and/or (b) multiple groups of average effect sizes varied more than predicted by sampling error. For the moderator analyses, we used a shifting unit of analysis (see Cooper, 2009 for a description). In this procedure, each effect size associated with one study is first coded as if it were an independent estimate of the relationship between DBP and the outcome. However, when estimating the overall effect of DBP, we averaged these effects prior to analysis so that the one sample only contributed one effect size. In contrast, when conducting moderator analyses, if a single sample provided a test of the effect of DBP for more than one category of a moderator (e.g. one sample provided the effect of DBP on both writing and reading achievement), we allowed a single sample to contribute one effect to each moderator category.

This method retains as much data as possible from each study while holding to a minimum any violations of the assumption of independent data points.

Because of our sampling method, we employed random-error assumptions (see Hedges & Vevea, 1998, for a discussion of fixed and random effects). In a fixed effect model, the model assumes that the studies are identical and only the sample is different among studies. The random effects model allows for variance from multiple sources rather than solely from the sample. The wide range of studies and interventions that all fall under the drama-based pedagogy definition suggests a need to focus on the random-error model. Past meta-analyses of drama-based pedagogies have reported fixed- and random-effects findings; however, further development and understanding of the statistical models no longer suggests this method for data integration (Borstein, Hedges, Higgins & Rothstein, 2009).

All statistical processes were conducted using the Comprehensive Meta-Analysis software package (Borenstein, Hedges, Higgins, & Rothstein, 2005). Only outcome measures that were reported in two or more separate reports with two or more independent samples were meta-analyzed.

2.1 *Results*

2.1.1 Overall Descriptive Results

Starting with 100 retrieved studies from the comprehensives search, we retained 32 articles for further analysis. Studies were discarded for various reasons including: a focus on ESL (k = 21), research design (k = 17), multi-arts (k = 12), no literacy-related outcome (k = 12), play or theatre focused (k = 2) or no measurable outcome or inadequate information to calculate effect estimates (k = 8). In the case of inadequate information, multiple attempts were made to clarify or retrieve additional information from authors. After several attempts to contact the

authors, we felt it reasonable to manually impute missing data for studies when possible. For all imputations, the most conservative estimates were used. For example, two studies only discussed the number of classrooms (rather than number of students); therefore, we used n = 20 for each classroom and calculated the corresponding number of students (Wright, 1986; Biegler, 1998). Additionally, one study did not report *n*s but did report the degrees of freedom for the *F* test. We divided the degrees of freedom in two to indicate the intervention and control groups (Walker, 2011a). Finally, one study did not report the post effect standard deviations; therefore, we used the pre intervention effect standard deviations (Risemberg & Zimmerman, 1992). This imputation allowed us to retain four additional studies. All other studies with missing statistical data were not included in the review (k=4). Within the final 32 studies, 49 independent samples with 209 separate effect estimates. There were 25,080 codes extracted by each coder. Of these, the highest discrepancy was for the activities used during the intervention. All discrepancies were resolved.

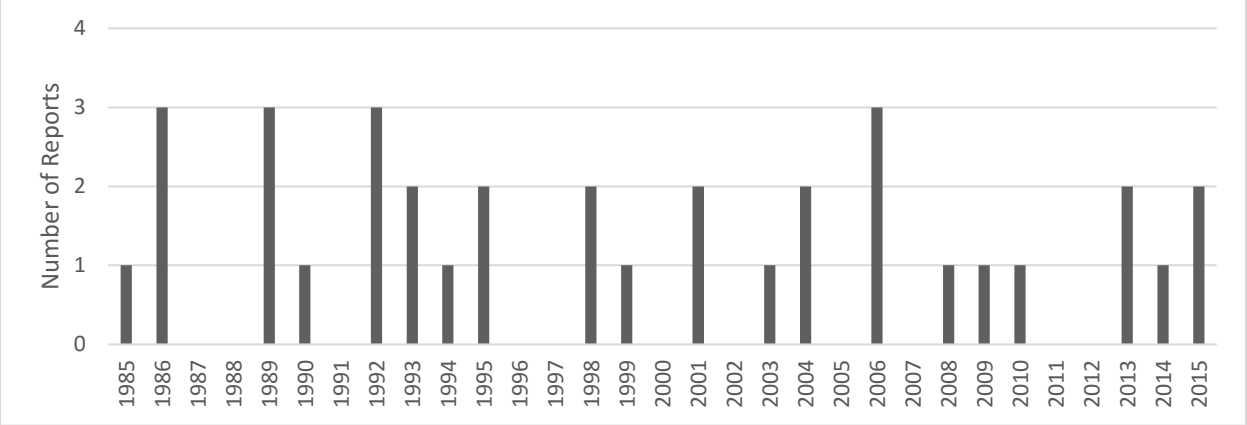
Variability of theoretical framing. Upon a qualitative review of the theoretical framing for these studies, researchers cite a wide range of learning theories. Most common are: cognitive constructivism (Piaget, 1952), social constructivism (Vygotsky, 1978), social learning (Bruner & Haste, 2010; Bandura,1999), and communities of practice (Lave & Wenger, 1991). Only one dramatic framework is mentioned more than once: process drama (Heathcote & Bolton, 1995). That being said, there is not a consistency among other research and theories that were cited including: story acting (Paley, 1990), dramatic inquiry (Edmiston, 2013), story drama (O'Neill, 1995), improvisation (Sawyer, 2004), experiential learning (Dewey, 1933), and multiple intelligences (Gardner, 1983), among others.

Variability by year of publication. Covering 30 years of studies, the search results show a steady

number of research studies throughout the years. No peak or pattern of publication dates seem to be present in the retrieved studies.

Chart 1

Number of reports for years 1985-2015



Variability in design. All studies included in this review compare an intervention group to a control/comparison group. Many studies use random sampling at the school level (Walker, 2011a; Walker, 2011b), classroom level (Fizano, 2005; Inoa, 2014; Rose, 2000; Walker, 2011a; Walker, 2011b), classroom level with a wait-listed control (Lee, Enciso & Austin Theatre Alliance, 2017; Nicopoloupou, 2015) or student level (Ballou, 2000; Byerly, 1994; Fischer, 1989; Freeman, 2000; Joseph, 2013; Moore & Caldwell, 1993; Rapapport, 1989; Warner, 2004; Wagner, 1986; McCambridge, 1998). Under the quantitative review, we compare these sampling designs to detect any potential difference in effects.

Variability in study samples and interventions. Because of the limitations of this study, all samples include typically developing students. At times, researchers mention that students are identified with certain learning disabilities or “at risk”; however, all samples seem to be a part of typical classroom instruction without the help of an aide or separate instruction in a resource

room.

This review focuses on literacy related outcomes; therefore, we also review the type of texts that are used in the interventions. Again, there are a wide range of texts from textbooks to contemporary (i.e., *Tuck Everlasting, A Single Shard)*, as well as traditional texts (i.e., *Hamlet, Romeo and Juliet, The Odyssey*). We are not able to qualitatively ascertain any noticeable trends of texts when using drama in the K-12 classroom.

Additionally, we gathered information on the ways drama-based pedagogy was used in the classroom. To that end, the majority of studies in this synthesis seem to use drama as a way to help students comprehend a story (k=17). Other approaches of DBP include: teaching a skill (k=4), embodying an idea or story to help generate new ideas or stories (k=7), and extending or deepening the understanding of a concept (k=7). As suggested previously, it was challenging to ascertain the exact nature of the intervention for many studies. For that reason, many studies are not included in this description.

Variability in outcomes. All outcomes in the studies are classified under one of five outcomes: achievement, attitudes, 21st century skills, self-concept, or motivation. That being said, these outcomes are measured in many ways. Typically, achievement is measured through standardized tests or another type of test (e.g., end of unit exam, teacher created quiz, etc.) or observational data (e.g., coding writing samples); however, a few instances use surveys as evidence for achievement. All attitudinal outcomes are measured with surveys; whereas, 21st century skills (i.e., collaboration, communication, creativity) are measured with a variety of measures including observational data, surveys, or another test measuring the outcome. Finally arts and motivation outcomes are measured with a survey or observational data.

2.1.2 Overall Quantitative Effect Estimates

Outlier detection and publication bias. All studies are grouped by outcomes for the quantitative meta-analysis. Within each of these outcomes, we performed a Grubbs outlier test on all effect estimates and sample sizes in order to help attenuate the influence of any atypical findings or sample sizes. For achievement, five study samples were windsorized to the nearest neighbor of n=201 (Chizhik, 2009; Inoa, 2013; Lee et. al, 2017; Walker, 2011a; Walker, 2011b). Additionally, one study effect estimate was windsorized to 1.92 (Fizano, 2005). Similarly, these studies were windsorized if included in the adjusted effects estimate (Fizano, 2005 to $d = 2.14$) and windsorized sample size (Lee et. al, 2017; Chizhik, 2009 to $n = 143$). Within the studies reporting attitude outcomes, only one study sample size was windsorized to n = 100 (Lee et. al, 2017). Within studies reporting 21st century outcomes, the sample size for Lee et. al was windsorized to 168. For the studies reporting arts outcomes, the sample size for Lee et. al was windsorized to 70. Additionally, all studies within each outcome were tested for publication bias based on the effect estimates using a trim and fill procedure. Assuming a random model of effect estimates, no publication bias was present within any of the studies when grouped by overall outcome.

Overall effect estimates. Because the studies varied in the specific DBP intervention and were sampled from the wide research literature, the random effect model best represents the effect estimates. This model allows for many sources of variability; therefore, we only report the random effect model findings. For this sample of studies, there is an overall positive, significant effect and adjusted effect of DBP on literacy achievement outcomes. There is an overall positive and significant effect of DBP on attitudes toward the domain of study (i.e., reading) but not for the adjusted effect; therefore, no further analyses was conducted on the adjusted effects. There is an overall positive and significant effect and adjusted effect of DBP on 21st century, motivation,

and arts outcomes. Too few studies reported outcomes for motivation (k = 4) and arts (k = 3); therefore, no further meta-analyses was conducted for these outcomes. See Table 2 for statistical results.

2.1.3 Moderator Analyses for Achievement

When the heterogeneity is significant (*Q* statistic) or when there is theoretical reasons, we conducted moderator analyses to better understand the potential moderation of the overall significant effects. See Table 3 for all statistical results.

Characteristics of Research Design. We assessed the design of the study through various potential moderators. We tested the sampling method (any use of random sampling or no random sampling), the relationship between the DBP and the measured outcome (proximity directly or indirectly related), who completed the measure for the outcome (students, teacher, observer), type of measure for achievement used (standardized test, another type of test, survey, or observer rating), and how many measures were used (one through ten or more). Of these, proximity, type of measure, and number of assessments are significant. For proximity, measures of the outcome directly related to the DBP intervention (using DBP for reading comprehension and assessment is in reading comprehension) are significantly more positive than those indirectly related (using DBP for reading comprehension and assessment is in math). For the type of measurement used, the largest effect is for another test measuring the outcome which is significantly more positive than a standardized achievement test. Additionally, the observer rating scale and surveys are significantly more positive than a standardized achievement test. No other significant differences are detected. Finally, the number of assessments significantly moderated the effect estimates for the sample of studies. Using one measure of achievement was significantly more positive than any other number of measures. Additionally, using two measures of achievement was

significantly more positive than using ten or more measures of achievement. All other numbers of measures used were not significant from one another.

For the adjusted effects, only proximity remains significant with directly related interventions and outcomes as significantly larger than indirectly related interventions and outcomes.

Characteristics of Sample. Due to lack of detail and/or descriptions across the sample of studies, the only characteristic of the sample we tested was the grade level of the students. Categories included: preK, lower elementary, upper elementary, middle school, high school, or college. Thirty-six of the samples were included in this analysis. No significant effects under the random effects model are present. No further analysis was conducted. A meta-regression analysis was conducted for the potential moderating effects of gender on the outcomes. No significant effects under the random effects model are present. For the adjusted effects, we see the same results.

DBP Intervention. We were able to test the potential moderators of the DBP intervention in multiple ways including: number of lessons, the leader of the DBP intervention, various intended uses of DBP as well as the domain of the DBP intervention. These analyses are reported in the following.

Number of lessons and hours of lessons implemented. Categorical variables include: 1-5 lessons, 6-10 lessons, 11-15, 16-20, more than 20 lessons. This moderator does not produce significant heterogeneity between the study samples under random effects assumptions. No further analysis was conducted. However, we next conducted an analysis on the hours of implementation: up to 2 hours, 3-6 hours, 7-10 hours, 11-20 hours, and more than 20 hours. Further comparison shows that 3-6 hours and 7-10 hours are not significantly different therefore

the categories were combined. The largest average effect is for the 3-10 hours of lessons which is significantly greater than all other categories. Additionally, studies reporting 11-20 hours are significantly more positive than more than 20 hours.

Under the adjusted effects, we see similar findings. There is no significant difference among number of lessons. For adjusted effects for the hours of lessons, the less than 2 hours category was not included in the analysis due to too few studies. Once again, the largest adjusted effect is for the 3-10 hours of lessons which is significantly more positive than the 11-20 or more than 20 hours of lessons categories.

Leader for the DBP. Categories included: classroom teacher, researcher, or teaching artist. Thirty-five of the samples are included in this analysis. This moderator produces significant heterogeneity between the study samples. The largest effect estimate is for studies reporting the classroom teacher leading the DBP which is significantly larger than treatments led by teaching artists, but not significantly different from treatments led by the researcher or both a teaching artist and teacher. No other significant differences are present.

For the adjusted effect estimates, we see similar findings. DBP interventions led by a classroom teacher has the largest effect and is significantly more positive than a researcher or teaching artist led intervention. The latter two are not significantly different from one another.

Moderators about the text used for intervention. We tested multiple aspects about the text used. These included: the type of text (nonfiction or fiction; traditional or contemporary), the length of text (partial or full), who read the text (teacher, students or both), and when the text was used throughout the DBP intervention (pre, during, post). No significant effects are detected. Similarly, no significant adjusted effects are present for these moderators.

Moderators about the DBP used during the intervention. We conducted various analyses

to better understand the potential moderating effects related to the DBP intervention. These categories included: when was DBP used during the intervention (pre, during, post) and why the DBP was used (comprehension, embodying ideas, extending ideas, and teaching skills/concepts). For the first moderator, there is a trend toward a significant difference ($p = .06$) and therefore, we conducted further analyses. That being said, the use of drama toward the end of the intervention (post) is the largest significant effect and is significantly more positive than when DBP was used throughout the intervention (during). No other significant differences are present. The same findings exist for adjusted effects with post having the largest significant effect which is significantly more positive than the during category but not for the pre category.

For the second DBP related moderator, there is no significant difference detected; however, for theoretical reasons, we pursued analyses further. The largest effect is the effects related to DBP used for comprehension which are trending toward significantly more positive than using DBP to teach and using DBP to extend ideas ($p < .10$). For the adjusted effects, no statistical difference is present.

Domain for the DBP intervention and domain for the outcome. Both of these moderators were divided into typical subject categories. For the domain of the DBP intervention, we used the following categories: reading, writing, both reading and writing, social studies. Thirty-two studies were included in this analysis. There is a significant difference detected under the random effects model. The largest effect is for reading which is significantly larger than when both reading and writing were the focus. Social studies is also significantly larger than when both reading and writing were the focus. No other significant differences are present. For adjusted effects, only 23 studies are included and only the categories for reading and writing are present. No significant differences are present between these categories.

For the domain of the outcome, studies fell under one of multiple categories: both reading and writing, math, reading, writing, social studies, and self-concept. This final category included studies measuring some type of self-evaluation (i.e., self-concept, self-efficacy). Significant heterogeneity was present. The largest effect is for writing and reading which are significantly more positive than math. No other significant differences are present. For the adjusted effects, studies only reported adjusted effects for outcomes relating to reading, writing, and self. Of these, reading and writing were the largest but not significantly different than self.

2.1.4 Moderator Analysis for Attitudes

When possible, we tested the same set of moderators for this outcome including characteristics of the research design, sample, and DBP intervention. Because so few moderators were significant under a random effect model and/or there were too few studies within a category and not enough variability to perform the analyses, we only list significant moderators.

Characteristics of Research Design. No moderators were significant for unadjusted effects. For the adjusted effects, proximity was a significant moderator in favor of directly related DBP interventions and outcomes as opposed to indirectly related.

Characteristics of Sample. Similar to the achievement outcome, we tested for the grade level of the sample as a potential moderator. There were only enough samples in elementary and middle school in order to be included in the analysis. Of the eight studies, middle school has significantly more positive effects than elementary samples. The same significant effect is present under adjusted effects. No further analysis is conducted.

2.1.5 Moderator Analysis for 21st Century Skills

With only 9 studies included in this meta-analysis, we were unable to conduct all of the moderator analyses as we conducted with achievement outcomes. We have included only

significant moderator analyses.

Characteristics of Research Design. We tested the sampling method, the relationship between the DBP and the outcome measured, and what type of measure for achievement was used. Of these, only sampling method is significant and is in favor of no random sampling. For the adjusted effects, sampling method remained significant in favor of no random sampling. No other moderators are significant.

Characteristics of DBP Intervention. We tested various moderators including: leader of the DBP and domain for the DBP intervention and outcome.

Leader of DBP intervention. There were only enough studies to compare two categories of leaders: classroom teacher and both a teacher and teaching artist. The largest effect estimate is for studies reporting the classroom teacher leading the DBP which is significantly larger than treatments led by both a teaching artist and teacher. No adjusted effects analysis could be conducted.

Domain for the DBP intervention and domain for the outcome. Eight studies were included in this analysis. There was a significant difference detected under the random effects model. The largest effect is for reading which is significantly larger than when both reading and writing or social emotional learning were the focus. No other significant differences were present. For adjusted effects, only six studies were included in the analysis and no significant differences were detected.

For the domain of the outcome, 12 studies fell under one of multiple categories: creativity, critical thinking, oral skills, and social skills. Significant heterogeneity is present. The largest effect is for critical thinking which are significantly more positive than oral skills but not significantly different from other categories. Creativity is also significantly more positive than

social skills. For the adjusted effects, no significant differences are present.

3.1 *Discussion and Conclusion*

Drama-based pedagogy has a significant positive effect on achievement, attitudes, 21st century skills, arts skills, and motivation outcomes in literacy. Further, Drama-based pedagogy has a significant positive adjusted effect on all of these outcomes except attitude. This suggests that DBP is making an important impact on students and their learning across many areas. The moderator analysis offers a nuanced understanding of the effects on achievement. In particular, the leader and the duration of the DBP intervention needs to be considered when developing interventions and future research. Interventions led by the classroom teacher and interventions that consisted of 3-10 hours of lessons have the strongest effect on achievement outcomes. These significant differences remain with adjusted effects assuming a random effects model. These are the most robust type of findings from this type of meta-analysis. This may suggest that DBP learning experiences are more impactful when informed by a focused inquiry (duration) and by learning theory and practice (leader).

Other potential moderators of achievement outcomes are also worth reviewing. The research design and measures may have a moderating effect on the outcomes. It is curious that random sampling did not have a significant moderating effect on the outcomes. For some audiences, this is the gold standard of research design and yet, for this sample of studies, it did not make a significant difference. Also important to note, studies that used a non-standardized test, survey, or observer rating scale had more significant effects than those that used standardized tests. Rather than suggest that this shows a lack of rigor, this may be more a reflection of the in situ, relevant nature of the other measures and the austere, irrelevant nature of standardized tests. DBP which depends on contextualized, ensemble focused interactions may not easily transfer to or show evidence of learning on these tests. Additionally, it is no

coincidence that the proximity between the DBP intervention and the measure of the outcome is a significant moderator. Research designs that align the measures to the intervention are able to better capture what is learned or being learned.

Although no obvious picture evolved in relationship to the DBP intervention and the texts used, a trend toward needing to consider modes of learning did emerge. For example, DBP was most effective when introduced before or after a text was introduced—not both together. Students not familiar with DBP (as many in these studies) may find it difficult to learn a *new* text in a *new* way. This should be considered when planning DBP learning sequences. Though not significant, there is a trend toward larger effects when DBP was used for story comprehension—rather than to teach a new skill, embody new ideas, or extend learning. This may also be explained in relationship to modes of learning. When used for story comprehension, typically the teacher reads a story and then gives very specific direction for recreating the story that students have just heard. This process reinforces the ideas from the story in an embodied way and builds upon and enriches the existing understanding.

Many advocates and researchers of drama-based pedagogies over-generalize or over-characterize its effects. This meta-analysis offers a critical look at the breadth of work that does indeed have a significant, positive effect on achievement in literacy outcomes; however, this meta-analysis also highlights some areas for more conservative discussion of effects and further research needs. In particular, there is not sufficient quasi-experimental research to strongly suggest that DBP has a significant positive effect on attitudes, arts skills, 21st century skills as well as motivation. This may be attributable to the current measures of these psychological constructs or to fewer studies measuring these outcomes being funded; however, more research needs to be done to further understand the findings from many qualitative research studies that

have suggested an effect on these outcomes (i.e., Crumpler, 2006; Cushman, 2011; Edmiston & McKibben, 2011; Medina & Campano, 2006; Wolf, 1994).

Many arts and education researchers have called for more cautious directives about the effects of arts in the classroom and the need for nuanced perspectives on the effects of DBP (Eisner, 1998; Fleming, et al., 2004; Mages, 2008; Wagner, 1998; Winner & Cooper, 2000). As this field continues to gain notice at the national level, the research needs to be situated in previous studies and offer clear language about the intervention. Even with the given limitations, this meta-analysis does seem to make clear that DBP does have a significant effect on literacy related outcomes for K-12 students, especially when led by a classroom teacher over many hours of instruction. This alone could help facilitate the meaningful support of DBP in teacher education programs as well as professional development experiences to make a difference for student learning.

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*Indicates study inclusion in meta-analysis.

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Table 1

Coding categories

Coding category	Specific codes	Example codes
Report	Author	
	Year of publication	
	Type of document	Journal, dissertation, thesis, unpublished, government
Study information	Research funding	
Characteristics of the DBP intervention	Total lessons	
	Total hours	
	Word to describe DBP	Creative drama, drama-based,
	Types of DBP	drama in education, role play,
	Leader of DBP and experience level	story drama, improvisation, other
		Classroom teacher, researcher, teaching artist, other arts teacher, other
	Domain of DBP	writing, reading, other literacy areas
	When was DBP used?	Beginning, Middle, End of lesson
	When were texts used?	Beginning, Middle, End of lesson
	Domain of the DBP intervention	Writing, Reading, Science, Math, Social Emotional Learning, Other[1]
Characteristics of control condition	Business as usual OR record all the relevant information	
Setting characteristics	State/country	
	Type of community	City, suburban, small city,
	Type of school	rural, other
		Public, private, religious affiliated
Research design	Research design	
	Attrition	
	Sampling procedure	
	Characteristics of matching	
	Local event/contaminant	
Sample characteristics	Sample/subsample	
	Labels for sample	

[1] Research studies focused on literacy learning in another area of the curriculum (e.g., Science or Math) were also included in this review.

	SES Gender Race/ethnicity Age of students Grade level	Typically developing, "at risk", gifted, learning disabled
Outcome measured	Type of outcome and subject How measured (i.e., standardized test, survey) Domain of outcome	 Standardized test, survey, teacher/researcher developed test, observer rating, interview, other Writing, reading, both, other
Effect size information	Pre-intervention effect/ unadjusted post-intervention effect/adjusted post-intervention effect Control variables When measured Unit of assignment and unit of statistical analysis Covariates for equating Effect size information	

Table 2

	Unadjusted d-index				Adjusted d-index			
	Random Effects				Random Effects			
Outcome	*k*	*d*	*p*	*Q*	*k*	*d*	*p*	*Q*
Achievement	37	.64	<.001	236.22***	28	.68	<.001	304.20***
Attitudes	11	.40	<.001	44.12***	6	.40	>.05	33.23***
21st Century Skills	9	.52	<.01	98.64***	8	.70	<.01	102.77***
Arts	3	.34	<.001	2.64	3	.45	<.001	6.79**
Motivation	4	.60	<.01	5.63	3	.69	<.05	5.62

Overall Effects of DBP on Literacy Related Outcomes

Table 3

Moderator Analysis

		Unadjusted d-index Random Effect			Adjusted d-index Random Effect	
Moderator	k	d	Q_b	k	d	Q_b
Characteristics of Research Design						
Research Sampling			.21			1.93
No random sampling	24	.61***		20	.54***	
Random sampling	13	.70***		8	1.04***	
Domain of outcome			11.83*			.85
Reading	15	.66***		15	.74***	
Writing	13	.71***		11	.66*	
Both reading & writing	5	.46**				
Math	2	.24**				
Social Studies	3	.54*				
Self-concept	2	.12		2	.48*	
Proximity between DBP and outcome			8.88*			6.58*
Direct	32	.68***		24	.77***	
Indirect	6	.24***		4	.25*	
Number of assessments used			26.65***			7.45
1	15	.87***		8	.69***	
2	6	.47***		5	.48***	
3	7	.05		2	.28*	
4	4	.24***		2	.42	
6	3	.38**		4	.15	
>10	3	.04		3	.14	
How measured			8.88*			5.68
Test (nonstandardized)	12	.89***		8	1.27**	
Observer rating scale	16	.59***		13	.43**	
Survey	3	.28		3	.62**	

Test (standardized)	12	.29***		11	.35***	
Characteristics of Sample						
Grade level			2.94			3.18
Preschool	2	.32		2	.45	
Elementary	26	.69***		21	.77***	
Middle	5	.57***		2	.17	
HS to College	3	.36				
Characteristics of DBP Intervention						
Leader			5.18			7.41*
Classroom	16	.89***		12	1.10***	
Researcher	11	.54***		6	.53**	
Teaching artist	5	.31**		7	.26*	
Both	3	.48***				
Domain of DBP intervention			9.93**			.004
Reading	16	.72***		15	.76***	
Writing	9	.67**		8	.74*	
Both reading & writing	4	.26***				
Social Studies	3	.64**				
When DBP used			5.32			6.94*
Pre	5	.74		3	1.14	
During	16	.41***		13	.31**	
Post	13	.94***		11	1.01***	
How DBP used			4.39			.95
Comprehension	17	.74***		13	.76***	
Embody	7	.73**		7	.81*	
Extending ideas	7	.39***		0		
Teaching	4	.33		5	.55***	
Hours of lessons			17.53***			7.52*
Up to 2 hours	4	.19		0		
3-10 hours	11	.87***		11	.92***	
11-20 hours	7	.59***		6	.26	
More than 20 hours	2	-.01		2	.11	