

Play as a Teaching Strategy for Children in Pre-Kindergarten to Grade 3: Findings from the Evidence Review

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I. Summary of findings

Introduction. This memo summarizes the findings from an evidence review that the Pennsylvania Office of Child Development and Early Learning (OCDEL) asked the Regional Educational Laboratory (REL) Mid-Atlantic to conduct on play as a teaching strategy for children in pre-kindergarten to grade 3.

As directed by OCDEL, we examined approaches to play as a teaching strategy implemented in academic settings, including preschools, elementary schools, and summer school programs. Our review focused on the academic achievement outcomes of students in pre-kindergarten through grade 3, including language development, early literacy, and early mathematics. Therefore, this memo describes findings on studies that included at least one academic outcome. Because of this focus, the findings do not emphasize the effects that play as a teaching strategy could have had on other important outcomes, such as physical and social-emotional development.

Our structured literature search yielded 22 studies that met our review eligibility criteria (the studies are listed in Table 1, and the structure of the literature search for this review is described in Appendix C). These studies focused on three approaches to play as a teaching strategy.¹ Each approach can include play with toys that can be explored or manipulated—for example, playing with blocks, figures, or other objects. It can also include dramatic or pretend play, meaning play that involves the transformation of objects or action in a symbolic manner; this can include role-taking, negotiation, and improvisation with or without objects.

The three approaches to play are as follows:

1. **Teacher-directed play:** This approach involves games and play activities that teachers plan as learning opportunities for their students. Teachers outline specific rules, and students follow them as they engage in the games and activities.
2. **Child-directed play:** Also known as free play, this approach gives students the opportunity to engage in a variety of play activities chosen freely and directed by themselves, without active guidance from teachers.
3. **Mutually directed play:** In this approach, teachers and students direct the games and play activities.

Findings. Only 2 of the 22 studies eligible for review provided evidence that meets the review criteria. Therefore, additional research on the effectiveness of play to improve the academic outcomes of students in pre-kindergarten to grade 3 would be useful to inform policy and practice related to early education. New research should focus on comparing play as a teaching strategy versus direct instruction or any other “business-as-usual” condition that does not include play.

It is important to consider what the comparison—that is, the counterfactual—is in an evaluation because it determines how the findings from the evaluation should be interpreted. When comparing an instructional approach that includes play (the intervention) with another instructional approach that does not include play (the counterfactual), we can learn whether play is the better way to improve students’ academic outcomes. In contrast, a comparison between two different approaches to play as a teaching strategy (for example, teacher-directed play versus child-directed play) cannot tell us whether play is an

¹ Pyle, A., C. DeLuca, and E. Danniels. “A Scoping Review of Research on Play-Based Pedagogies in Kindergarten Education.” *Review of Education*, vol. 5, no. 3, 2017, pp. 311–351.

effective instructional approach; it can only tell us whether using play as a teaching strategy in one way is more effective than using it in another way.

One of the two studies that meets the review criteria compares the three approaches to play—teacher-directed, child-directed, and mutually directed—with one another. Therefore, that study provides evidence on the best ways to use play as a teaching strategy, but it does not provide evidence on whether play is more effective in improving learning outcomes than other instructional approaches that do not include play.

The two studies that meet the review criteria provide evidence on mutually directed and teacher-directed approaches to play. These studies show that the mutually directed approach is supported by *promising*² evidence—relative to instruction without play and relative to child-directed play. One of these studies also shows that the teacher-directed approach to play is supported by *promising* evidence, but only relative to child-directed play.

The first of these studies (Toub et al. 2018³) focused on 249 students ages 4 and 5 in Head Start preschool classrooms in Eastern Pennsylvania and pre-kindergarten classrooms in Central Tennessee. All students in the study did an enriched, shared book-reading activity, followed by a play session based on one of three approaches: (1) “guided play” (mutually directed), (2) “free play” (child directed), or (3) “directed play” (teacher directed). Students were randomly assigned to one of the three approaches. This study showed that students in the mutually directed or teacher-directed play groups had higher scores on tests of receptive and expressive vocabulary than students in the child-directed play group; these differences were statistically significant.

The second study (Han et al. 2010⁴) focused on 49 students ages 4 and 5 in a Head Start preschool program in a mid-Atlantic state. The students were randomly assigned to a group that took part in a mutually directed play session or to a group that did not have a play session. The study showed that the students who engaged in the mutually directed play session had significantly higher scores on a test of expressive vocabulary compared with the students who did not take part in this play session.

We also found that the child-directed approach to play is not supported by any level of existing evidence (strong, moderate, or promising).

Finally, we found one study (Farran et al. 2019⁵) that showed *unfavorable* effects of the Tools of the Mind curriculum, which involves a teacher-directed approach to play, on the letter-word identification and spelling outcomes of students in grade 1. These unfavorable findings mean that we did not find evidence

² According to the Every Student Succeeds Act (ESSA) standards, studies can provide strong, moderate, or promising evidence for an intervention, practice, or strategy. We describe the requirements for meeting each level of evidence in more detail in Section II. Review process.

³ Toub, T.S., B. Hassinger-Das, K.T. Nesbitt, H. Ilgaz, D.S. Weisberg, K. Hirsh-Pasek, R.M. Golinkoff, A. Nicolopoulou, and D.K. Dickinson. “The Language of Play: Developing Preschool Vocabulary Through Play Following Shared Book-Reading.” *Early Childhood Research Quarterly*, vol. 45, 2018, pp. 1–17.

⁴ Han, M., N. Moore, C. Vukelich, and M. Buell. “Does Play Make a Difference? How Play Intervention Affects the Vocabulary Learning of At-Risk Preschoolers.” *American Journal of Play*, summer 2010, pp. 82–105.

⁵ Farran, D.C., S.J. Wilson, D. Meador, J. Norvell, and K. Nesbitt. “Experimental Evaluation of the Tools of the Mind Pre-K Curriculum: Technical Report.” Nashville, TN: Peabody Research Institute, Vanderbilt University, 2015.

at any level (strong, moderate, or promising) that supports this curriculum and its teacher-directed approach to play. Only favorable findings contribute to evidence that meets ESSA standards.

Table 1 lists the 22 studies that we reviewed and summarizes our conclusions about the level of evidence they provide, based on the standards of the Every Student Succeeds Act (ESSA).

Table 1. List of studies included in the evidence review

Study citation	Approaches to play examined	Contributes evidence according to the ESSA standards? ^a
Toub et al. (2018)	Mutually directed play Teacher-directed play Child-directed play	Yes. Findings from the study on mutually directed and teacher-directed play compared with child-directed play provide promising evidence.
Han et al. (2010)	Mutually directed play	Yes. Findings from the study on mutually directed play compared with instruction without play provide promising evidence.
Kotsopoulos et al. (2015)	Mutually directed play Teacher-directed play	No
Barnett et al. (2008)	Teacher-directed play	No
Blair et al. (2018)	Teacher-directed play	No
Campbell (2016)	Teacher-directed play	No
Diamond et al. (2007)	Teacher-directed play	No
Dickinson et al. (2019)	Teacher-directed play	No
Farran et al. (2015)	Teacher-directed play	No
Hsueh et al. (2014)	Teacher-directed play	No
Mackay (2013)	Teacher-directed play	No
Rodgers (2012)	Teacher-directed play	No
Solomon et al. (2018)	Teacher-directed play	No
Stebler et al. (2013)	Teacher-directed play	No
Trawick-Smith et al. (2016)	Teacher-directed play	No
Vogt et al. (2018)	Teacher-directed play	No
Youmans et al. (2018)	Teacher-directed play	No
Fisher et al. (2013)	Teacher-directed play Child-directed play	No
Cavanaugh et al. (2017)	Child-directed play	No
Lindsey (2016)	Child-directed play	No
Trawick-Smith et al. (2017)	Child-directed play	No
Youngblood (2017)	Child-directed play	No

^a The assessments of the level of evidence provided by each study can be found in Appendix B.

Considerations. There are three considerations when interpreting the findings from this review of play as a teaching strategy. First, we did not find strong or moderate evidence supporting *any* of the three approaches to play. However, two studies did provide promising evidence on teacher-directed and mutually directed approaches to play.

Second, promising evidence provided by one study (Toub et al. 2018) for the teacher-directed and mutually directed approaches refers to the effectiveness of these approaches compared with a child-directed approach to play, not compared with direct instruction or any other approach that does not

include play. Therefore, the findings from this study (Toub et al. 2018) do not indicate whether using play as a teaching strategy is more effective than direct instruction in improving learning outcomes. The study suggests that when play is used to teach emergent literacy skills (such as receptive and expressive vocabulary skills), it is more effective to have teacher involvement in the play (such as with a teacher-directed or mutually directed approach) than not having any teacher interaction in the play (such as with a child-directed or free-play approach).

Third, the available research is limited. Of the 22 studies in this review, 13 are based on a rigorous evaluation design (randomized controlled trial or quasi-experimental design), but only 4 are well-designed and well-implemented experimental or quasi-experimental studies.⁶ Moreover, the sample sizes in the 2 studies that provided promising evidence are small, and only 1 (Han et al. 2010) of the 4 studies that are well-designed and well-implemented experimental or quasi-experimental studies assessed the effectiveness of play as a teaching strategy compared with direct instruction (typically, the business-as-usual condition in the early grades).

This memo. Section II of this memo describes the review process and provides details on the ESSA standards. Sections III, IV, and V present our findings on the evidence for the teacher-directed and mutually directed approaches to play as a teaching strategy. Appendix A describes the studies included in the review that did not contribute evidence, and Appendix B includes the evidence assessments (based on the ESSA standards) we conducted for each study. Finally, Appendix C describes the literature search conducted for this review.

II. Review process

The REL review team assessed the level of evidence for each activity, strategy, and intervention (for brevity, we refer to all of these as “interventions”) using the non-regulatory ESSA guidance.⁷ The REL decided to use the ESSA standards because they provide a clear framework describing different levels of evidence: strong, moderate, and promising evidence⁸. As shown in Figure 1, each of these evidence levels (strong, moderate, and promising) has specific criteria. However, it is important to note that all evidence levels require that (1) there is at least one statistically significant and positive (that is, favorable) effect on a student outcome or other relevant outcome, and (2) the favorable effect is not over-ridden by statistically significant and negative (that is, unfavorable) evidence—in other words, to meet this requirement the number of relevant outcomes with statistically significant and *favorable* effects in a study should be *greater than or equal to* the number of relevant outcomes with statistically significant and *unfavorable* effects in the same study or in another study identified at the same time for review on the *same* intervention or practice. Therefore, if a study does not meet those two requirements, then it does

⁶ That is, these 4 studies meet the What Works Clearinghouse (WWC) standards (2 studies meet without reservations, and 2 studies meet with reservations). These studies are described in more detail in Sections III, IV, and V of this memo.

⁷ <https://www2.ed.gov/policy/elsec/leg/essa/guidanceusseinvestment.pdf>

⁸ The ESSA includes a fourth level of evidence (“demonstrates rationale”), which requires two components: (1) that the practice have a logic model or theory of change supported by high-quality research or positive evaluation findings for a key component and (2) that a concurrent or future study will be examining the effects of the intervention. For this evidence review, unfinished studies or studies that have not yet been released publicly were not eligible, and thus we did not consider this fourth level of evidence.

not meet the ESSA evidence criteria—that is, the study does not provide strong, moderate, or promising evidence.⁹

The REL library staff conducted a literature search to find studies for this review.¹⁰ The search terms and databases they used can be found in Appendix C. The literature search yielded 141 studies. The REL team reviewed the abstracts of these 141 studies and identified 22 studies that met the following criteria: (1) were published in the last 20 years, (2) examined the effectiveness of play as a teaching strategy, (3) examined at least one academic outcome of students in pre-kindergarten to grade 3,¹¹ and (4) were implemented in academic settings. Table 1 lists these 22 studies.

⁹ Section 8101(21)(A) of the Elementary and Secondary Education Act defines an “evidence-based intervention” as an intervention that demonstrates a statistically significant effect on improving student outcomes or other relevant outcomes based on *strong, moderate, or promising* evidence from at least one study.

¹⁰ The literature search followed the procedures described in the WWC Procedures and Standards Handbook, Version 3.0., https://ies.ed.gov/ncee/wwc/Docs/referenceresources/wwc_procedures_v3_0_standards_handbook.pdf. See Section II (Developing the Review Protocol and Identifying Relevant Literature, p. 4) and Appendix B (Policies for Searching and Prioritizing Studies for Review).

¹¹ We did not review studies that did not include at least one academic outcome. But we report findings for all outcomes (academic and nonacademic, such as social-emotional outcomes) for the studies included in the review.

Figure 1. ESSA criteria for identifying strong, moderate, and promising evidence

Strong Evidence	Moderate Evidence	Promising Evidence
<ul style="list-style-type: none"> • At least one well-designed and well-implemented experimental study.^a • The study shows at least one statistically significant and positive (favorable) effect on a student outcome or other relevant outcome. • The favorable effect(s) is(are) not over-ridden by statistically significant and negative (unfavorable) effects from the same study or other studies of similar quality. • The study includes a large, multi-site sample. • The study includes a sample that overlaps with the populations (the types of students served) and with the settings proposed to receive the intervention. 	<ul style="list-style-type: none"> • At least one well-designed and well-implemented quasi-experimental study.^b • The study shows at least one statistically significant and positive (favorable) effect on a student outcome or other relevant outcome. • The favorable effect(s) is(are) not over-ridden by statistically significant and negative (unfavorable) effects from the same study or other studies of similar quality. • The study includes a large, multi-site sample. • The study includes a sample that overlaps with the populations (the types of students served) or with the settings proposed to receive the intervention. 	<ul style="list-style-type: none"> • At least one well-designed and well-implemented correlational study with statistical controls for selection bias.^c • The study shows at least one statistically significant and positive (favorable) effect on a student outcome or other relevant outcome. • The favorable effect(s) is(are) not over-ridden by statistically significant and negative (unfavorable) effects from the same study or other studies of similar quality.

Source: <https://www2.ed.gov/policy/elsec/leg/essa/guidanceusesinvestment.pdf>.

^a An experimental study is considered to be “well-designed and well-implemented” if it meets WWC evidence standards without reservations or is of equivalent quality for making causal inferences. For this review, we followed Version 3.0 of the WWC Procedures and Standards Handbook (https://ies.ed.gov/ncee/wwc/Docs/referenceresources/wwc_procedures_v3_0_standards_handbook.pdf) and the Review of Individual Studies Protocol (https://ies.ed.gov/ncee/wwc/Docs/ReferenceResources/wwc_ris_protocol_v3.pdf). We recorded the findings from individual reviews using the online Study Review Guide.

^b A quasi-experimental study is considered to be “well-designed and well-implemented” if it meets WWC evidence standards with reservations or is of equivalent quality for making causal inferences.

^c A correlational study is considered to be “well-designed and well-implemented” if it uses sampling and/or analytic methods to reduce or account for differences between the intervention group and a comparison group.

III. Findings on mutually directed and teacher-directed play relative to child-directed play

According to the ESSA standards, the findings from the following study provide promising evidence on mutually directed and teacher-directed play relative to child-directed play:

Toub, T.S., B. Hassinger-Das, K.T. Nesbitt, H. Ilgaz, D.S. Weisberg, K. Hirsh-Pasek, R.M. Golinkoff, A. Nicolopoulou, and D.K. Dickinson. "The Language of Play: Developing Preschool Vocabulary Through Play Following Shared Book-Reading." *Early Childhood Research Quarterly*, vol. 45, 2018, pp. 1–17.

Why Toub et al. (2018) provides promising evidence for the intervention, according to the ESSA standards:

- The study does not meet the ESSA criteria for providing strong or moderate evidence because its findings are not based on a large sample of students.
- The study is a randomized controlled trial for which the study's authors reported that after conducting random assignment, they made "adjustments to those initial arrangements in a small minority of cases, based on consideration of teachers' input on behavioral incompatibility, an aim to have mixed-gender groups, and attendance." (p. 4). Such adjustments compromised the integrity of the assignments to intervention conditions. For that reason, this study cannot be considered as a well-designed and well-implemented experimental study.¹²
- The study meets the ESSA criteria for providing promising evidence because (1) its findings show favorable (statistically significant and positive) effects of mutually-directed and teacher-directed play (as compared to child-directed play) on preschool and pre-kindergarten students' receptive and expressive vocabulary outcomes; (2) these favorable effects are not overridden by unfavorable effects (statistically significant and negative) from this study or other studies of similar quality; and (3) the study's quality is equivalent or superior to the quality of a well-designed and well-implemented correlational study with statistical controls for selection bias.
- The completed evidence template used for our review of Toub et al. (2018) is in Appendix B of this memo.

What the study showed. Toub et al. (2018) focused on the effectiveness of mutually directed and teacher-directed play relative to child-directed play. It did not examine the effectiveness of these approaches relative to an approach without play. The study showed that students assigned to the groups that received mutually directed or teacher-directed play had significantly higher scores on tests of receptive and expressive vocabulary than the students assigned to the group that received child-directed play. The test of receptive vocabulary used in this study was developed by the study authors based on the Peabody

¹² The intervention and comparison groups in the study satisfy the baseline equivalence requirement, so the study meets WWC group design standards with reservations.

Picture Vocabulary Test (PPVT).¹³ The authors assessed expressive vocabulary skills using the New Word Definition Test—Modified.¹⁴

The authors found favorable effects on receptive and expressive vocabulary from mutually directed and teacher-directed play relative to child-directed play. This means that (1) mutually directed and teacher-directed play are more effective in improving vocabulary development than child-directed play, and (2) there are no favorable effects of child-directed play on any outcomes of interest compared with mutually directed or teacher-directed play.

The authors did not find statistically significant differences between mutually directed play and teacher-directed play on either receptive or expressive vocabulary skills. This means that neither of these approaches is more effective than the other in improving vocabulary development.

Brief description of the intervention, excerpted from Toub et al. (2018). The intervention included direct instruction on vocabulary followed by a play activity. All students in this study engaged in an enriched, shared book-reading activity, followed by an activity based on one of three different approaches to play as a teaching strategy: (1) mutually directed play (“guided play” in the study), (2) child-directed play (“free play”), or (3) teacher-directed play (“directed play”). Children were randomly assigned to one of these three approaches to play.

The book-reading activity lasted 10 minutes, was scripted, and included direct instruction of word meanings and comprehension-related discussions. The play activities that followed included toys and props related to the story reviewed earlier. In the mutually directed approach to play, teachers joined the students’ play and incorporated vocabulary by building on what the children were already doing. In the child-directed approach to play, teachers did not interact with the children during the play activities. And in the teacher-directed play approach, teachers used a script, which included target vocabulary words, to direct the children to re-enact the story from the book used in the earlier reading activity.

Who participated in the study. Toub et al. (2018) examined 249 students ages 4 and 5 who attended Head Start preschool classrooms in Eastern Pennsylvania and pre-kindergarten classrooms in central Tennessee. Of the 249 students, 46 percent were male, 54 percent were female, 55 percent were African American, 14 percent were White, 23 percent were Hispanic, 1 percent were Asian, and 7 percent were biracial or some other race. Teachers reported that 15 percent of the students in the sample were designated as English-language learners. More information about sample characteristics and the study setting can be found on page 4 of the study.

Caveats. The study had four main caveats: (1) it included a small sample (249 students: 83 assigned to mutually directed play, 84 assigned to child-directed play, 82 assigned to teacher-directed play); (2) it reassigned sample members, which compromised the integrity of the random assignment; (3) it examined the effectiveness of three approaches to play as a teaching strategy by comparing the approaches to one another and not to regular vocabulary instruction (direct instruction) without the use of play as teaching strategy; and (4) it examined play as a teaching strategy for students ages 4 and 5, not for older students (in grades 1 to 3).

¹³ Dunn, L.M., and D.M. Dunn. *Peabody Picture Vocabulary Test (PPVT-IV)*. San Antonio, TX: Pearson Clinical Assessments, 2007.

¹⁴ Hadley, E.B., D.K. Dickinson, K. Hirsh-Pasek, R.M. Golinkoff, and K.T. Nesbitt. “Examining the Acquisition of Vocabulary Knowledge Depth Among Preschool Students.” *Reading Research Quarterly*, vol. 51, no. 2, 2016, pp. 181–198.

IV. Findings on mutually directed play relative to instruction without play

According to the ESSA standards, the findings from the following study provide promising evidence on mutually directed play relative to instruction without play:

Han, M., N. Moore, C. Vukelich, and M. Buell. "Does Play Make a Difference? How Play Intervention Affects the Vocabulary Learning of At-Risk Preschoolers." *American Journal of Play*, summer 2010, pp. 82–105.

Why Han et al. (2010) provides promising evidence for the intervention, according to the ESSA standards:

- The study is a well-designed and well-implemented experimental study,¹⁵ but it does not meet the ESSA criteria for providing strong or moderate evidence because its findings are not based on a large or multisite sample of students.
- The study meets the ESSA criteria for providing promising evidence because (1) its findings show favorable (statistically significant and positive) effects of mutually-directed play (as compared to instruction without play) on preschool students' expressive vocabulary skills; (2) this favorable effect is not overridden by unfavorable effects (statistically significant and negative) from this study or other studies of similar quality; and (3) the study's quality is equivalent or superior to the quality of a well-designed and well-implemented correlational study with statistical controls for selection bias.
- The completed ESSA evidence template used for our review of Han et al. (2010) is in Appendix B of this memo.

What the study showed. The study examined the effectiveness of mutually directed play relative to instruction without play (the business-as-usual condition). Students participating in the study were randomly assigned to a group that received the mutually directed play intervention (the intervention group) or to a group that did not receive the intervention (the comparison group). The study's findings indicate that students who received mutually directed play as a teaching strategy had significantly higher scores on a test of expressive vocabulary compared with students who did not receive mutually directed play. The test of expressive vocabulary used in this study was based on the Individual Growth and Development Indicators: Picture Naming test.¹⁶ The study did not show any statistically significant impact of the mutually directed play on students' receptive vocabulary (as measured by the PPVT-III) or on the percentage of students who met the PPVT-III benchmark for their age (in this case, a score of 85 to 115).

Brief description of the intervention, excerpted from Han et al. (2010). The intervention included dramatic play and constructed play activities designed to give substance and meaning to target words so that children learn those words. The intervention consisted of a mutually directed approach to play, incorporating adult- and child-guided play and props. The play included pretend actions; for example, if the target vocabulary word was "bake," one adult and one child pretended to bake a cake using materials like a pan and oven mitts. During the play session, the adult and child also used motions like using the

¹⁵ This study is a randomized controlled trial with low attrition. For that reason, this study meets WWC group design standards without reservations.

¹⁶ Early Childhood Research Institute on Measuring Growth and Development. "Individual Growth and Development Indicators for Preschool Children (IGDI)." 2000.

oven mitts to take the pan out of a pretend oven. The adult received a play script that included information on the suggested actions. However, the child was free to enact the suggested actions as he or she wanted and to guide the development of the play activity.

Students in the intervention group received the play intervention in addition to the Explicit Instructional Vocabulary Protocol (EIVP). The EIVP is a seven-step process that includes showing the child the target word, saying the word, asking the child to say the word, defining the word using a child-friendly definition, asking the child to give the definition, doing an action related to the word, and asking the child to repeat the action. The mutually directed play intervention was implemented as the “eighth” step after the seven EIVP steps to support understanding of the target word. The first 20 minutes were devoted to the standard EIVP curriculum, and the final 10 minutes were devoted to play. Students in the comparison group received the seven EIVP steps only and did not have the play session. For the comparison group, the full 30 minutes were devoted to the standard EIVP curriculum.

Who participated in the study. The study included 49 students ages 4 and 5 who attended one Head Start preschool program in a mid-Atlantic state. The students in the sample were selected from a larger pool of 118 kindergarten students in Head Start. They were selected because their families met the federal guidelines for poverty, they were not identified as having special needs, and their standard scores on the PPVT-III were at least one standard deviation below the mean (85 points). About 53 percent of the students were male and 47 percent female. The majority of the students were Hispanic (65 percent), 24 percent were African American, 4 percent were biracial, 2 percent were Caucasian, and 4 percent were some other race. About 59 percent spoke Spanish at home, 27 percent spoke English at home, and 14 percent spoke English and another language at home.

Caveats. The study has two main caveats: (1) it involved a small sample of students from one site (49 students: 24 assigned to the mutually directed play intervention group, and 25 assigned to the comparison group), and (2) it examined play as a teaching strategy for young students ages 4 and 5 but did not examine play for older students in grades 1 to 3.

V. Findings on teacher-directed play relative to instruction without play

According to the ESSA standards, the findings from the following study do not provide strong, moderate, or promising evidence on teacher-directed play relative to instruction without play:

Barnett, W.S., K. Jung, D.J. Yarosz, J. Thomas, A. Hornbeck, R. Stechuk, and S. Burns. "Educational Effects of the Tools of the Mind Curriculum: A Randomized Trial." *Early Childhood Research Quarterly*, vol. 23, 2008, pp. 299–313.

Why Barnett et al. (2008) does not provide strong, moderate, or promising evidence for the intervention, according to the ESSA standards:

- The study is a well-designed and well-implemented experimental study,¹⁷ but it does not meet the ESSA criteria for providing any level of evidence (strong, moderate, or promising evidence) because the favorable impact findings from the study are over-ridden by the unfavorable impacts found by Farran et al. (2015).
- The completed ESSA evidence template used for our review of Barnett et al. (2008) is in Appendix B of this memo.

What the study showed. This study examined the effectiveness of Tools of the Mind—a curriculum that includes teacher-directed play, with teachers guiding students to write play plans, plan their dramatic play, and think about next steps during their play, with the intention of fostering self-regulation—as compared to instruction without play. Students participating in the study were randomly assigned to either the Tools of the Mind curriculum or to a business-as-usual condition, which involved the continued use of a curriculum developed by the school district. The findings showed that, compared with the business-as-usual condition, teacher-directed play (Tools of the Mind) had statistically significant positive impacts on students' scores on the Oral Language Proficiency Test.

Brief description of the intervention. Tools of the Mind is a preschool and kindergarten curriculum developed by Bodrova and Leong (1996).¹⁸ It involves a teacher-directed approach to play as a teaching strategy that seeks to support student learning and development while emphasizing emergent academic skills and self-regulation. Tools of the Mind focuses most directly on cognitive development, specifically executive function, in young children through the mechanism of social interaction. Techniques for supporting or scaffolding the development of executive function are embedded in classroom group activities designed primarily to promote the learning of academic content. Tools of the Mind also builds social-emotional skills via purposeful interactions with classmates, such as make-believe play and cooperative learning activities.¹⁹ The Tools of the Mind curriculum enables teachers to incorporate activities designed to promote dramatic play, foster self-regulation, and teach the use of aids to facilitate

¹⁷ This study is a randomized controlled trial with low attrition. For that reason, this study meets WWC group design standards without reservations.

¹⁸ Bodrova, E., and D.J. Leong, D. J. "Tools of the Mind: The Vygotskian Approach to Early Childhood Education." Upper Saddle River, NJ: Prentice-Hall, 1996.

¹⁹ As explained earlier, the focus of this review is on academic outcomes, including language development, early literacy, and early mathematics. Thus, the findings we report here do not emphasize the effects that play as a teaching strategy could have had on other important outcomes, such as social-emotional skills.

memory. Teachers use a play-planning process to support students' development of mature play. During this planning, teachers help students write play plans, instruct them to plan their dramatic play together, and ask them to think about next steps during their play, with the goal of developing their emergent academic skills and self-regulation.

Who participated in the study. This study involved 209 children ages 3 and 4 and 18 teachers from a high-poverty New Jersey school.

According to the ESSA standards, the findings from the following study do not provide strong, moderate, or promising evidence on teacher-directed play relative to instruction without play:

Farran, D.C., S.J. Wilson, D. Meador, J. Norvell, and K. Nesbitt. "Experimental Evaluation of the Tools of the Mind Pre-K Curriculum: Technical Report." Nashville, TN: Peabody Research Institute, Vanderbilt University, 2015.

Why Farran et al. (2015) does not provide strong, moderate, or promising evidence for the intervention, according to the ESSA standards:

The quality of this study is equivalent to the quality of a well-designed and well-implemented quasi-experimental study.²⁰ However, Farran et al. (2105) does not meet the ESSA criteria for providing moderate or promising evidence because its findings show unfavorable (statistically significant and negative) impacts of Tools of the Mind on relevant students' outcomes (scores on tests of letter-word identification and spelling skills).

The completed ESSA evidence template used for our review of Farran et al. (2015) is in Appendix B of this memo.

What the study showed. In this five-year study, schools were randomly assigned to implement the Tools of the Mind curriculum or to implement the typical curricular practices that were already used in the schools (business as usual). The study consisted of two cohorts: Cohort 1: 2009–2010 school year and Cohort 2: 2010–2011 school year. The study found unfavorable effects of Tools of the Mind (negative and statistically significant impacts) for Cohort 1 students when they were in grade 1 (spring 2013) on two vocabulary outcome measures: (1) Scores on the Woodcock-Johnson III (WJIII) Letter-Word Identification subtest; and (2) Scores on the WJIII Spelling subtest. The study also showed null impacts (no statistically significant differences between the intervention and comparison groups) on the scores of grade 1 students in Cohort 2 (spring 2014) on the WJIII Letter-Word Identification and Spelling subtest. Finally, the study showed null impacts for grade 1 students in Cohorts 1 and 2 on scores on the following subtests of the WJIII: Academic Knowledge, Oral Comprehension, Picture Vocabulary, Applied Problems, and Quantitative Concepts.

Brief description of the intervention. The Tools of the Mind curriculum includes a teacher-directed approach to play as a teaching strategy. In this curriculum, teachers guided students to write play plans, plan their dramatic play, and think about next steps during their play (additional details on the Tools of the Mind curriculum are included in the description of the Barnett et al. (2008) study presented earlier).

²⁰ This study is a randomized controlled trial with high attrition, but the intervention and comparison groups in the analytic sample satisfy the baseline equivalence requirement. For that reason, this study meets WWC group design standards with reservations.

Who participated in the study. The study included 1,143 pre-kindergarten students in 57 schools from four school districts in Tennessee and two school districts in North Carolina.

Appendices to the memo on Play as a Teaching Strategy for Children in Pre-Kindergarten to Grade 3: Findings from the Evidence Review

Appendix A. Additional Studies Considered in the Review

This appendix describes studies that do not meet ESSA standards for providing either strong, moderate, or promising evidence because (1) they are not well-designed and well-implemented experimental, quasi-experimental, or correlational studies, or (2) their findings do not show favorable (positive and statistically significant) effects of the intervention on relevant outcomes (academic outcomes, including language development, early literacy, and early mathematics). None of the studies described in this appendix showed favorable effects that were overridden by unfavorable (negative and statistically significant) effects shown in the same study or in other studies included in the review.

Table A.1 shows information on the following study that compared mutually directed play and instruction without play:

Kotsopoulos, D., S. Makosz, J. Zambrzycka, and K. McCarthy. "The Effects of Different Pedagogical Approaches on the Learning of Length Measurement in Kindergarten." *Early Childhood Education Journal*, vol. 43, 2015, pp. 531–539.

Kotsopoulos et al. (2015) does not meet the ESSA standards for providing promising evidence because it does not show any favorable effect of the intervention on relevant outcomes.

Table A.1. Study on mutually directed play that does not meet ESSA standards for providing promising evidence

Short citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
Kotsopoulos et al. (2015)	The study authors examined mutually directed and teacher-directed play (Table A.2 describes the study findings on teacher-directed play). In the mutually directed play, children had access to two "play centers" for three consecutive days. The students could circulate through the centers by their own initiative or by their teacher's suggestion. The purpose of one center was to engage children in activities that involved using nonstandard units of measurement. In the other center, students played with blocks and were free to build any structures that they chose.	This study involved a randomized controlled trial. The authors randomly assigned three kindergarten classrooms (with 64 students) from one elementary school to implement either (1) a teacher-directed play teaching strategy ("guided instruction"), (2) a mutually directed play teaching strategy ("center-based learning"), or (3) a comparison condition in which no particular teaching strategies were assigned ("free exploration"). This study cannot be considered as a well-designed and well-implemented experimental or quasi-experimental study because there was	This study revealed no statistically significant association between classroom assignment (the intervention condition) and students' ability to measure in standard and nonstandard units.	This study does not meet the ESSA standards for providing promising evidence because it does not show any statistically significant effects of the intervention on any relevant outcome.

Short citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
		only one kindergarten classroom in each treatment condition (guided instruction, center-based learning, and free exploration), confounding the unit of assignment (classroom) with the treatment condition. Therefore, this review considered the study as a well-designed and well-implemented correlational study with statistical controls for selection bias.		

Table A.2 summarizes the following 14 studies that **examined teacher-directed play** that do not contribute promising evidence, based on ESSA standards:

Blair, C., R.D. McKinnon, and M.P. Daneri. "Effect of the Tools of the Mind Kindergarten Program on Children's Social and Emotional Development." *Early Childhood Research Quarterly*, vol. 43, 2018, pp. 52–61.

Campbell, Kelly M. "Trajectories of Children's Writing Development in Pre-Kindergarten: Six Months of Repeated Measures." Dissertation manuscript. Berkeley, CA: University of California, Berkeley, 2016.

Diamond, A., W.S. Barnett, J. Thomas, and S. Munro. "Preschool Program Improves Cognitive Control." *Science*, vol. 318, 2007, pp. 1387–1388.

Dickinson, D.K., M.F. Collins, K. Nesbitt, T.S. Toub, B. Hassinger-Das, E. Burke Hadley, K. Hirsh-Pasek, and R.M. Golinkoff. "Effects of Teacher-Delivered Book Reading and Play on Vocabulary Learning and Self-Regulation Among Low-Income Preschool Children." *Journal of Cognition and Development*, vol. 20, no. 2, 2019, pp. 136–164.

Fisher, K.R., K. Hirsh-Pasek, N. Newcombe, and R.M. Golinkoff. "Taking Shape: Supporting Preschoolers' Acquisition of Geometric Knowledge Through Guided Play." *Child Development*, vol. 84, no. 6, 2013, pp. 1872–1878.

Hsueh, J., A.E. Lowenstein, P. Morris, S.K. Mattera, and M. Bangser. "Impacts of Social-Emotional Curricula on Three-Year-Olds: Exploratory Findings from the Head Start CARES Demonstration." OPRE Report 2014-78. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, 2014.

Kotsopoulos, D., S. Makosz, J. Zambrzycka, and K. McCarthy. "The Effects of Different Pedagogical Approaches on the Learning of Length Measurement in Kindergarten." *Early Childhood Education Journal*, vol. 43, 2015, pp. 531–539.

Mackay, P.E. "The Effects of Tools of the Mind on Math and Reading Scores in Kindergarten." *Open Access Dissertations*, no. 807. Amherst, MA: University of Massachusetts Amherst, 2013.

- Rodgers, M.S. "Structured Play and Student Learning in Kindergarten: An Outcome Evaluation." Dissertation manuscript. Boston, Massachusetts Northeastern University, 2012.
- Solomon, T., A. Plamondon, A. O'Hara, H. Finch, G. Goco, P. Chaban., L. Huggins, B. Ferguson, and R. Tannock. "A Cluster Randomized-Controlled Trial of the Impact of the Tools of the Mind Curriculum on Self-Regulation in Canadian Preschoolers." *Frontiers in Psychology*, vol. 8, 2018, pp. 1–18.
- Stebler, R., F. Vogt, I. Wolf, B. Hauser, and K. Rechsteiner. "Play-Based Mathematics in Kindergarten. A Video Analysis of Children's Mathematical Behaviour While Playing a Board Game in Small Groups." Posted at the Zurich Open Repository and Archive, University of Zurich, 2013 (originally published in the *Journal für Mathematik-Didaktik*, vol. 34, no. 2, 2013, pp. 149–175).
- Trawick-Smith, J., S. Swaminathan, and X. Liu. "The Relationship of Teacher-Child Play Interactions to Mathematics Learning in Preschool." *Early Child Development and Care*, vol. 186, no. 5, 2016, pp. 716–733.
- Vogt, F., B. Hauser, R. Stebler, K. Rechsteiner, and C. Urech. "Learning Through Play—Pedagogy and Learning Outcomes in Early Childhood Mathematics." *European Early Childhood Education Research Journal*, vol. 26, no. 4, 2018, pp. 589–603.
- Youmans, A.S., J.R. Kirby, and J.G. Freeman. "How Effectively Does the Full-Day, Play-Based Kindergarten Programme in Ontario Promote Self-Regulation, Literacy, and Numeracy?" *Early Child Development and Care*, vol. 188, no. 12, 2018, pp. 1788–1800.

Table A.2. Other studies examining teacher-directed play that do not meet ESSA standards for providing promising evidence

Study citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
Blair et al. (2018)	The authors examined Tools of the Mind as the intervention. Teachers who were implementing this curriculum with kindergarteners taught children how to engage in intentional make-believe play through two planning processes: interactive reading, in which children planned their roles to play, and collaboration in small groups, in which children planned what they would play together. Each group had props that they could use to work cooperatively to act out the story.	This study involved a clustered randomized controlled trial, in which 29 schools in 12 school districts were randomly assigned to the Tools of the Mind group or to a comparison condition, in which schools continued using their regular curricula and instructional activities (business as usual). There were 715 kindergarten students in the study. This study cannot be considered as a well-designed and well-implemented experimental or quasi-experimental study because it includes joiners and it did not demonstrate that the intervention (Tools of the Mind) and comparison groups in the analytic sample were	This study did not show statistically significant impacts on academic competence. However, there were statistically significant, positive impacts on behavior problems (fewer problems), aggression, self-regulation, social-emotional competence, and positive teacher-child relationships.	This study does not meet the ESSA requirements for providing promising evidence because it does not show statistically significant, positive impacts of the intervention on any relevant outcome (academic outcomes).

Study citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
		baseline equivalent. Therefore, this review considered the study as a well-designed and well-implemented correlational study with statistical controls for selection bias.		
Campbell (2016)	The author investigated teacher-directed play. In this approach, teachers provided scaffolding and guided children as they wrote in their Play Plan, which is a daily activity from the Tools of the Mind curriculum. Children planned, drew, and wrote messages about their dramatic play choices.	In this mixed-methods study, the author examined weekly writing samples from 62 children (ages 3 and 4) over six months. The author analyzed children's writing development using the Simple Scoring Rubric to measure name writing and the Early Writing-10 (EW10) scoring system.	Findings from a hierarchical linear model indicated a statistically significant, positive association between children's name-writing ability at school entry and the EW10 score at the end of the intervention. Results from univariate <i>t</i> -tests suggest that older children (4-year-olds) had better writing abilities than younger children (3-year-olds).	This study does not meet the ESSA requirements for providing promising evidence because it is not a well-designed and well-implemented correlational study (it does not include a comparison group).
Diamond et al. (2017)	The authors examined teacher-directed play in which teachers used the Tools of the Mind curriculum to support children's efforts to develop executive functioning skills.	The study involved a randomized controlled trial in which 18 teachers were randomly assigned to either Tools of the Mind or to a standard academic curriculum that did not explicitly cover executive function skills. Six classrooms were added to the sample within two years after randomization. The study focused on examining executive functioning outcomes of 145 preschoolers (ages 4 and 5).	The findings suggest that children who participated in Tools of the Mind had significantly better executive functioning skills than children in the comparison group.	This study does not meet the ESSA requirements for providing promising evidence because it does not show statistically significant, positive impacts of the intervention on any relevant outcome (academic outcomes)
Dickinson et al. (2019)	The authors examined the effectiveness of Read-Play-Learn, which is a teacher-directed intervention to teach vocabulary to preschoolers through book reading and play. In book reading, teachers read each	This study involved a randomized controlled trial, with 10 classrooms randomly assigned to the intervention condition (book reading and teacher-guided play) and 6 classrooms randomly assigned to the comparison	Findings suggest that there were no significant differences between the intervention and comparison conditions on the two vocabulary outcome measures: receptive vocabulary	This study does not meet the ESSA requirements for providing promising evidence because it does not show statistically significant impacts of the intervention on

Study citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
	intervention book four times (over four days) and used definitions, gestures, and pictures to teach the focus words. In the teacher-directed play, teachers led children in a re-enactment of the story using toys, such as figurines and replica props, and posed framing questions to help children get started, describe and repeat their play actions, elaborate their talk, prompt their word use, and act playfully.	condition (book reading only). The participants were 210 preschool-age children from low-income families who were attending Tennessee's Voluntary Pre-K Program and Head Start preschool classrooms in Pennsylvania. This study cannot be considered as a well-designed and well-implemented experimental or quasi-experimental study because it is a randomized controlled trial in which attrition rates cannot be assessed, and the intervention and comparison groups in the analytic sample are not shown to be equivalent at baseline. Therefore, this review considered the study as a well-designed and well-implemented correlational study with statistical controls for selection bias.	and expressive vocabulary.	any relevant outcome.
Fisher et al. (2013)	The authors examined teacher-directed play as a teaching strategy to improve shape knowledge. The intervention was delivered individually to each student by one interventionist once for 15 minutes. The interventionists provided each student with cards (each card containing one of four shapes: triangle, rectangle, pentagon, or hexagon) and sticks that can be used to create shapes. Each child was given 7	The authors randomly assigned 70 preschool students (ages 4 and 5) to either (1) a group receiving the child-directed play intervention, (2) a group receiving a teacher-led play intervention that used cards showing shapes and sticks, or (3) a comparison group in which the teacher taught shapes to students using cards and sticks but did not have the students play with the cards or sticks. This study cannot be considered as a well-	The study showed a statistically significant effect on shape identification skills; the children taught shapes in the teacher-directed play condition showed improved shape knowledge compared with the other groups.	This study does not meet the ESSA requirements for providing promising evidence because the one favorable impact from this study is over-ridden by the two unfavorable impacts reported by Farran et al. (2015).

Study citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
	minutes to play freely with the cards and 6 minutes to play freely with the sticks.	implemented experimental or quasi-experimental study because it is a randomized controlled trial in which attrition rates cannot be assessed, and the intervention and comparison groups in the analytic sample are not shown to be equivalent at baseline. Therefore, this review considered the study as a well-designed and well-implemented correlational study with statistical controls for selection bias.		
Hsueh et al. (2014)	The authors examined Tools of the Mind. This curriculum includes daily make-believe play that is guided by the teacher.	The study involved a cluster randomized controlled trial in which 104 participating Head Start centers were randomized to one of four study conditions: one of the three intervention groups (Tools—Play, Incredible Years, or PATHS) or the comparison group. This study cannot be considered as a well-designed and well-implemented experimental or quasi-experimental study because it is a randomized controlled trial in which attrition rates cannot be assessed, and the intervention and comparison groups in the analytic sample are not shown to be equivalent at baseline. Therefore, this review considered the study as a well-designed and well-implemented correlational study with	The study showed no statistically significant findings of the effects of Tools of the Mind on academic or social-emotional outcome measures.	This study does not meet the ESSA requirements for providing promising evidence because it does not show any statistically significant effects of the intervention on any relevant outcome.

Study citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
		statistical controls for selection bias.		
Kotsopoulos et al. (2015)	The authors examined mutually directed play and teacher-directed play. In the teacher-directed play condition, teachers implemented three lessons with the whole class over three consecutive days. Each lesson focused on measuring objects using standard units of measure (meter sticks) and nonstandard units of measure (small gems).	The authors used a randomized controlled trial, randomly assigning three kindergarten classrooms (with 64 students) from one elementary school to implement either (1) a teacher-directed play strategy ("guided instruction"), (2) a mutually directed play strategy ("center-based learning"), or (3) a comparison condition in which no particular teaching strategies were assigned ("free exploration"). This study cannot be considered as a well-designed and well-implemented experimental or quasi-experimental study because there was only one kindergarten classroom in each treatment condition (guided instruction, center-based learning, and free exploration), confounding the unit of assignment (classroom) with the treatment condition. Therefore, this review considered the study as a well-designed and well-implemented correlational study with statistical controls for selection bias.	This study did not show any statistically significant association between classroom assignment (the intervention condition) and students' ability to measure in standard and nonstandard units.	This study does not meet the ESSA requirements for providing promising evidence because it does not show any statistically significant effects of the intervention on any relevant outcome.
Mackay (2013)	The author used Tools of the Mind, a teacher-directed approach to play as a teaching strategy, to examine associations with kindergarten math and	This correlational study involved 191 students. The intervention group, which used Tools of the Mind, consisted of 97 students from five kindergarten classrooms	The author found a statistically significant, negative association between the intervention and academic progress in reading. Students in the	This study does not meet the ESSA requirements for providing promising evidence because it reports an unfavorable

Study citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
	reading scores. Students participated in dramatic play, first making props to use in the dramatization and then choosing the roles they will play. Each student then drew and wrote his or her play plan. During dramatized play, teachers were recommended to intervene only to prompt staying in roles or using props.	from 2010 to 2011. The comparison group consisted of 94 students from five kindergarten classrooms from 2008 to 2009.	intervention group had significantly lower reading scores than students in the comparison group. The study did not show any statistically significant, positive effects of the intervention.	association between participation in the intervention and academic progress in reading, and it does not show any favorable associations between the intervention and any relevant outcomes.
Rodgers (2012)	The author examined teacher-directed play. Teachers in the study used the Tools of the Mind curriculum to support students. Tools of the Mind focuses on developing students' literacy skills and self-regulation through structured make-believe play and games.	This study included four classrooms in two elementary schools that implemented the Tools of the Mind curriculum as a pilot during the 2010–2011 school year. Four teachers took part in the study with about 50 students. The author analyzed students' scores on the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) test and compared them with the national norms for the fall, winter, and spring benchmark administrations.	Descriptive statistics showed that students who received the Tools of the Mind curriculum had higher average DIBELS scores than the minimum benchmark scores for the fall, winter, and spring administrations. The authors did not run any statistical tests to examine mean differences between the two groups.	This study does not meet the ESSA requirements for providing promising evidence because it is not a well-designed and well-implemented correlational study (it does not include a comparison group).
Solomon et al. (2018)	The authors examined Tools of the Mind, a teacher-directed approach to play, to see the effects of the curriculum on students' language and cognitive development and self-regulation skills. In Tools of the Mind, teachers use a play-planning process and specific interactions to support children's pretend play. Teachers ask children to consider the setting, the	This is a randomized controlled trial in which 20 classrooms with 256 students were randomly assigned to the intervention (Tools of the Mind) or to the comparison group (YMCA Playing to Learn) across two cohorts. This study cannot be considered as a well-designed and well-implemented experimental or quasi-experimental study because it is a	The study focused on receptive vocabulary, expressive vocabulary, letter recognition, counting principles, developmental progress, executive functioning, and positive and negative behavior outcomes. However, the authors did not report any significant positive impacts on any student outcome measures.	This study does not meet the ESSA requirements for providing promising evidence because it does not show statistically significant, positive impacts of the intervention on at least one relevant outcome.

Study citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
	language that a character might use, and what the character will be doing and then to draw a picture of the play scenario. While the play is occurring, the teachers help children stay in character and suggest additional things that the characters could do or say. Teachers can also incorporate pretend play into other portions of the curriculum.	randomized controlled trial with high attrition, and the intervention and comparison groups in the analytic sample are not shown to be equivalent at baseline. Therefore, this review considered the study as a well-designed and well-implemented correlational study with statistical controls for selection bias.		
Stebler et al. (2013)	The authors investigated a teacher-directed play intervention in a play-based training program. Teachers received two days of training in methods of fostering mathematical competency among kindergarteners. In this intervention, students were given a free choice of selecting a board game or card game and forming groups with their peers.	This study is a subsample of a larger randomized controlled trial study, in which classes were randomly assigned to one of three conditions: (1) a play-based approach (11 classrooms with 89 children), (2) a training program (12 classrooms with 110 children), or (3) a comparison group (12 classrooms with 125 children). However, the authors did not compare student outcomes between conditions. Instead, the authors watched videos of play interactions between 21 6-year-olds in 7 of the classrooms that were using the play-based approach. For that reason, this study cannot be considered as a well-designed and well-implemented experimental, quasi-experimental, or correlational study.	The authors observed children as they played, and found that they used mathematical skills, such as counting and assigning numbers to the game activities, to support their peers and maximize their chances of winning.	This study does not meet the ESSA requirements for providing promising evidence because it is not a well-designed and well-implemented correlational study (it does not include a comparison group).
Trawick-Smith et al. (2016)	The authors examined teacher-directed play, with teachers	In this mixed-methods study, authors reviewed video recordings of 47	Findings from multiple regression analysis indicate a statistically	This study does not meet the ESSA requirements for

Study citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
	implementing a full-day, play-based curriculum in each classroom for one hour.	children and their teachers they engaged in play activities. The authors examined children-teacher interactions and children's scores on the Test of Early Mathematics Ability, Third Edition (TEMA-3), which measures number skills and knowledge of math concepts in children ages three to eight years.	significant, positive association between children-teacher interactions and post-test TEMA-3 scores.	providing promising evidence because it is not a well-designed and well-implemented correlational study (it does not include a comparison group).
Vogt et al. (2018)	The authors examined a teacher-directed approach to play using cards and board games. The play-based intervention consisted of 24 units that are each 30 minutes long and focus on quantity-number competencies. An example of a game is called "More Is More," in which each child has a deck of cards, with each card depicting three structured quantities of points in different colors. Children have to compare the top card in their deck to a card that the teacher shows to all the children in the game (the central card). If the children's card shows more of one of the colors than the central card, they can discard the card. Otherwise, the children place their card at the bottom of their deck and then uncover the next card at the top of their deck to play again. The first child to discard all of his or her cards is the winner.	The study involved a randomized controlled trial in which 35 kindergarten teachers were randomly assigned to either (1) a group implementing the play-based intervention (89 students), (2) a group implementing a math instruction intervention that did not include play (110 students), or (3) a comparison group implementing a business-as-usual approach that did not include play (125 students). Because the study intervention was conducted in German, this review did not consider the study as a well-designed and well-implemented experimental or quasi-experimental study. ^a Instead, this review considered the study as a well-designed and well-implemented correlational study.	The authors estimated effects of the curriculum on students' mathematical competencies using ANOVA and conducted a correlational analysis by baseline level of competency (low, moderate, or high). The findings suggest a significant association between time and condition. The authors did not report any statistically significant and positive impacts of the intervention on math competencies.	This study does not meet the ESSA requirements for providing promising evidence because it does not show statistically significant, positive impacts of the intervention on at least one relevant outcome.

Study citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
Youmans et al. (2018)	This study involved a teacher-directed approach to play through the Full-Day Early Learning Kindergarten (FDELK) based in Ontario, Canada. This play-based aspect of the program was intended to increase students' interaction with peers and their opportunities for active learning.	The authors used a quasi-experimental design to compare students in schools that had FDELK with students in half-day kindergarten or alternate-day kindergarten schools. There were 32,027 students in the sample, with 6,453 students at the 213 FDELK schools and 25,574 students at the 732 non-FDELK schools. This study cannot be considered as a well-designed and well-implemented quasi-experimental study because the intervention and comparison groups in the analytic sample are not shown to be equivalent at baseline. This review considered the study as a well-designed and well-implemented correlational study.	Findings suggest that there were no statistically significant, positive differences in self-regulation, literacy, and numeracy outcomes between the students receiving the intervention (FDELK) and the comparison group.	This study does not meet the ESSA requirements for providing promising evidence because it does not show statistically significant, positive impacts of the intervention on at least one relevant outcome.

^a This study involved a randomized controlled trial, but we reviewed it as if it had a correlational design because the intervention was conducted in German and was therefore not eligible for review against WWC standards.

Table A.3 presents information on the following five studies that (as compared to instruction without play or to other approaches to play as a teaching strategy) do not provide strong, moderate, or promising evidence according to the ESSA Standards:

Cavanaugh, D.M., K.J. Clemence, M.M. Teale, A.C. Rule, and S.E. Montgomery. "Kindergarten Scores, Storytelling, Executive Function, and Motivation Improved Through Literacy-Rich Guided Play." *Early Childhood Education Journal*, vol. 45, 2017, pp. 831–843.

Fisher, K.R., K. Hirsh-Pasek, N. Newcombe, and R.M. Golinkoff. "Taking Shape: Supporting Preschoolers' Acquisition of Geometric Knowledge Through Guided Play." *Child Development*, vol. 84, no. 6, 2013, pp. 1872–1878.

Lindsey, M.D. "The Interrelationship of Pre-Kindergarten Writing and an Early Childhood Play Environment." Dissertation manuscript. Stillwater, OK: Oklahoma State University, 2016.

Trawick-Smith, J., S. Swaminathan, B. Baton, C. Danieluk, S. Marsh, and M. Szarwacki. "Block Play and Mathematics Learning in Preschool: The Effects of Building Complexity, Peer and Teacher Interactions in the Block Area, and Replica Play Materials." *Journal of Early Childhood Research*, vol. 15, no. 4, 2017, pp. 433–488.

Youngblood, C.K. "Kindergarten Literacy Readiness Before and After HighScope Implementation." Dissertation manuscript. Minneapolis, MN: Walden University, 2017.

Table A.3. Studies examining child-directed play that do not meet ESSA standards for providing promising evidence

Study citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
Cavanaugh et al. (2017)	The authors examined child-directed play; the intervention involved asking students to generate their own games and play them to practice initial sounds of words (phonemic awareness) and word family concepts (phonics and vocabulary) after having participated in teacher-led activities that focused on learning initial sounds of words and word family concepts, respectively. The intervention took place during a 15-minute period once a day for three weeks.	The authors used a quasi-experimental design in which 41 students from two kindergarten classrooms in two schools were assigned to participate in either the child-directed play intervention and the teacher-led activities (the intervention group, or Group B) or to participate in the teacher-led activities only (the comparison group, or Group A). Midway through the study (after three weeks of the intervention), researchers switched the assignments, and Group A received the intervention while Group B became the comparison group. For that reason, the REL review team considered only the findings for the first half of the study (only the findings that refer to the contrast of Group B as the intervention group and Group A as the comparison group after three weeks of intervention). This study cannot be considered as a well-designed and well-implemented quasi-experimental study because the intervention and comparison groups in the analytic sample are not shown to be equivalent at baseline. This review considered the study as a well-designed and well-implemented correlational study.	The findings from the first half of the study showed no statistically significant impacts of the intervention on students' scores on the DIBELS instrument.	This study does not meet the ESSA requirements for providing promising evidence because it did not show statistically significant, positive impacts of the intervention on at least one relevant outcome.

Study citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
Fisher et al. (2013)	The authors examined child-directed play as a teaching strategy to improve shape knowledge. The intervention was delivered individually to each student by one interventionist once for 15 minutes. The interventionists provided each student with cards (each card containing one of four shapes: triangle, rectangle, pentagon, or hexagon) and sticks that can be used to create shapes. Each child had 7 minutes to play freely with the cards and 6 minutes to freely play with the sticks.	The authors randomly assigned 70 preschool students (ages 4 and 5) to either (1) a group receiving the child-directed play intervention, (2) a group receiving a teacher-led play intervention that involved cards showing shapes and sticks, or (3) a comparison group in which the teacher taught shapes to students using cards and sticks but did not have the students play with the cards or sticks. This study cannot be considered as a well-designed and well-implemented experimental or quasi-experimental study because it is a randomized controlled trial in which attrition rates cannot be assessed, and the intervention and comparison groups in the analytic sample are not shown to be equivalent at baseline. Therefore, this review considered the study as a well-designed and well-implemented correlational study with statistical controls for selection bias.	The findings did not show any statistically significant impacts of the child-directed play intervention, compared with the business-as-usual condition, on students' shape knowledge (the number of times the student identified shapes correctly as real or not real).	This study does not meet the ESSA requirements for providing promising evidence it did not show statistically significant, positive impacts of the intervention on at least one relevant outcome.
Lindsey (2016)	The author examined child-directed play. The intervention included writing in the classroom's dramatic play center. Students were free to engage in the writing activities for as long as they wanted during free-play time.	This study consisted of a 12-week observation of how 19 children in one pre-kindergarten classroom interacted with writing as they engaged in free-choice play in the classroom. The authors collected qualitative data through classroom observations, brief interviews with children who had created writings or drawings during play, and reviews of student	The analysis of the qualitative data suggests that early experiences with writing in the dramatic play center can engage children in writing exploration and conventional writing through play.	This study does not meet the ESSA requirements for providing promising evidence because it is not a well-designed and well-implemented correlational study (it does not include a comparison group).

Study citation	Approach to play as a teaching strategy	Study sample and design	Findings	Justification
		documents or artifacts such as photocopies of their written work or drawings.		
Trawick-Smith et al. (2017)	The authors examined child-directed play, implemented in a “block center” in the classrooms. This center had unit blocks of varying lengths, shapes, and sizes. The play period occurred in each classroom for one hour in the morning and one hour in the afternoon. Children could also select other play activities, such as engaging in pretend play, assembling puzzles, and reading books.	This mixed-methods study relied on data from video recordings of 41 children in four classrooms who were playing with blocks in a classroom. The authors examined children’s scores on the Tools for Early Assessment in Mathematics (TEAM) instrument, which measures a range of math abilities, including patterns, geometry, and measurement.	A two-stage hierarchical multiple regression analysis revealed a statistically significant, positive association between block play in the classroom and post-test TEAM scores.	This study does not meet the ESSA requirements for providing promising evidence because it is not a well-designed and well-implemented correlational study (it does not include a comparison group).
Youngblood (2017)	The author examined the HighScope curriculum, a hands-on, child-centered curriculum that includes a planning activity for students, small- and large-group instruction, and outdoor play (which incorporates child-directed play).	The author compared the letter identification, sound identification, and reading outcomes of 73 preschool students in a cohort that did not receive the intervention (2010–2011 cohort) with the outcomes of preschool students in two cohorts that received the intervention (72 students in the 2011–2012 cohort and 73 in the 2012–2013 cohort).	The study revealed a statistically significant, positive correlation between participation in the HighScope curriculum and students’ letter identification, sound identification, and reading skills.	This study does not meet the ESSA requirements for providing promising evidence because it is not a well-designed and well-implemented correlational study (the study used a comparison group but did not use statistical controls for selection bias).

Appendix B. Evidence Assessments Based on the ESSA Standards

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Toub, T. S., B. Hassinger-Das, K. T. Nesbitt, H. Ilgaz, D. S. Weisberg, K. Hirsh-Pasek, R. M. Golinkoff, A. Nicolopoulou, and D. K. Dickinson. "The language of play: Developing preschool vocabulary through play following shared book-reading". *Early Childhood Research Quarterly*, vol. 45, 2018, pp. 1-17.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines receptive and expressive vocabulary, as well as self-regulation measures.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines the three approaches to play as teaching strategy we considered in this review: (1) mutually-directed play, (2) child-directed play, and (3) teacher-directed play.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); or (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); or (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses either an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), or a quasi-experimental design [QED], or a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; and (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (This applies to mutually-directed play and teacher-directed play).	The study uses a RCT design and reports a favorable impact of mutually-directed play on receptive vocabulary and expressive vocabulary skills, when compared to child-directed play. The study reports statistically significant, negative impacts of child-directed play on receptive and expressive vocabulary skills, when compared to mutually-directed play. The study reports statistically significant, positive impacts of teacher-directed play on receptive and expressive vocabulary skills, when compared to child-directed play.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The relevant finding on mutually-directed play

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	(This applies to mutually-directed play and teacher-directed play).	remains and it is not overridden by any unfavorable results. However, the study found unfavorable impacts of child-directed play on receptive and expressive vocabulary. The favorable impacts of teacher-directed play on receptive and expressive vocabulary skills are not overridden by the unfavorable impacts shown in Farran et al. 2015.
<p>5. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study has a multi-site sample (10 classrooms in Eastern Pennsylvania and 18 in Tennessee), but the number of students (249 students) in the study is smaller than 350 so it cannot be considered as large.
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹		
8. Is the study or report one of the following: (a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u> (c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i> , or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i> ² — (i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i> ; <u>and</u> (ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i> ; <u>and</u> (iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input checked="" type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”)—Only for mutually-directed play and teacher-directed play <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Han, M., N. Moore, C. Vukelich, and M. Buell. "Does Play Make a Difference? How Play Intervention Affects the Vocabulary Learning of At-Risk Preschoolers." *American Journal of Play*, summer 2010, pp. 82-105.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined expressive vocabulary, receptive vocabulary, and percentage of students meeting the vocabulary benchmark for their age.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined mutually-directed play.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study used an experimental design eligible for the highest WWC rating, and reports a statistically significant and favorable impact of mutually-directed play on expressive vocabulary.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least	<input type="checkbox"/> Yes <input type="checkbox"/> No	The relevant finding on mutually-directed play is not overridden by any unfavorable results.

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹		
<p>5. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); or</p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; or</p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; and</p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; and</p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study does not have a multi-site sample and it does not have a large sample (total sample size in the study is 49 students, which is less than 350 students).
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>8. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); or</p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; or</p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one <i>relevant finding that Meets What Works Clearinghouse Standards without Reservations</i>; and</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC Handbook; and</p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC Handbook on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>Mark the highest level of evidence provided by this study or report for the intervention or practice of interest:</p> <p><input checked="" type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”)</p> <p><input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”)</p> <p><input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)</p>		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Kotsopoulos, D., S. Makosz, J. Zambrzycka, and K. McCarthy. "The Effects of Different Pedagogical Approaches on the Learning of Length Measurement in Kindergarten." *Early Childhood Education Journal*, vol. 43, 2015, pp. 531-539.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines student's mathematical abilities to use measuring devices and to measure in standard and non-standard units.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study focuses on mutually-directed play and teacher-directed play.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	This is a correlational study that did not report any statistically significant, positive correlation between participating in the intervention and any relevant outcome for either approach to play.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC Handbook reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); or</p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC Handbook reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; or</p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC Handbook, or on the basis of your <i>own</i> study review using Version 3.0 of the WWC Handbook²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC Handbook; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC Handbook on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC Handbook reporting a “strong” evidence base for a recommendation on a practice in (2); or</p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC Handbook reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; or</p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC Handbook, or on the basis of your own study review using Version 3.0 of the WWC Handbook²—</p> <p>(i) at least one relevant finding <i>that Meets What Works Clearinghouse Standards without Reservations</i>; and</p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC Handbook; <u>and</u></p>		

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Barnett, W. S., K. Jung, D. J. Yarosz, J. Thomas, A. Hornbeck, R. Stechuk, and S. Burns.
 “Educational effects of the Tools of the Mind curriculum: A randomized trial.” *Early Childhood Research Quarterly*, vol. 23, 2008, pp. 299-313.

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined vocabulary skills, oral language skills, general mathematics achievement, print knowledge skills, and cognition. The study also examined a non-academic outcome, Problems Behaviors Scale of the Social Skills Rating System (SSRS).
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined Tools of the Mind, which includes teacher-directed play as a teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study uses a RCT design eligible for the highest WWC rating and reports a statistically significant, positive impact of the intervention on vocabulary development, as measured by the PPVT-III.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The one favorable impact from this study is overridden

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹		by the two unfavorable impacts found by Farran et al. 2015.
5. Is the study or report one of the following: (a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); or (b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u> (c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i> , or on the basis of your <i>own</i> study review using Version 3.0 of the WWC <i>Handbook</i> ² — (i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i> ; <u>and</u> (ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i> ; <u>and</u> (iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following: (a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); or (b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u> (c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i> , or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i> ² —	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i> ; <u>and</u> (ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i> ; <u>and</u> (iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Blair, C., R. D. McKinnon, and M. P. Daneri. "Effect of the Tools of the Mind kindergarten program on children's social and emotional development." *Early Childhood Research Quarterly*, vol. 43, 2018, pp. 52-61.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines academic competence (it also examines child behavior outcomes).
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines the Tools of the Mind curriculum.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study is a RCT with joiners (and the analytic sample did not meet the baseline equivalence requirement) that did not find statistically significant impacts on academic competence (but it found statistically significant, positive impacts on behavior problems, aggression, self-regulation, social-emotional competence, and positive teacher-child relationships).
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); or</p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the <i>WWC Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); or</p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on the basis of your own study review using Version 3.0 of the <i>WWC Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; and</p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i>; <u>and</u></p>		

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Campbell, Kelly M. "Trajectories of Children's Writing Development in Pre-Kindergarten: Six Months of Repeated Measures." Dissertation manuscript, University of California, Berkeley, 2016.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	This study examined early writing skills.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined teacher-directed play as a teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	This study does not include a comparison group.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Is the study or report one of the following: (a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a "potentially positive" effect or	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results?¹</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p>	
<p>Mark the highest level of evidence provided by this study or report for the intervention or practice of interest:</p> <p><input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”)</p> <p><input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”)</p> <p><input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)</p>		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Diamond, A., W. S. Barnett, J. Thomas, and S. Munro. "Preschool Program Improves Cognitive Control, *Science*, vol. 318, 2007, pp. 1387-1388.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	The study focuses on executive functioning outcomes. The study does not examine academic outcomes.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined teacher-directed play as a teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study uses an experimental design, but it does not show statistically significant, positive impacts of the intervention on any relevant outcome (academic outcomes).
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹		
<p>5. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the <i>WWC Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>8. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
<p>9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results?¹</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>Mark the highest level of evidence provided by this study or report for the intervention or practice of interest:</p> <p><input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”)</p> <p><input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”)</p> <p><input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)</p>		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Dickinson, D. K., M. F. Collins, Molly F., K. Nesbitt, T. S. Toub, B. Hassinger-Das, E. Burke Hadley, K. Hirsh-Pasek, and R. M. Golinkoff. "Effects of Teacher-Delivered Book Reading and Play on Vocabulary Learning and Self-Regulation among Low-Income Preschool Children." *Journal of Cognition and Development*, vol. 20, no. 2, 2019, pp. 136-164.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	The study examines vocabulary development (and self-regulation outcomes).
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	The study examines teacher-directed play as a teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study uses a RCT design but the analysis does not provide a credible measure of the effectiveness of the intervention, and the study does not show statistically significant impacts on any relevant outcomes.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations or Meets What Works Clearinghouse Standards without Reservations</i>; and</p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; and</p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <i>or</i></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <i>or</i></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; and</p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; and</p>		

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<i>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?</i> ³		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Farran, D.C., S.J. Wilson, D. Meador, J. Norvell, and K. Nesbitt. "Experimental Evaluation of the Tools of the Mind Pre-K Curriculum: Technical Report." Nashville, TN: Peabody Research Institute, Vanderbilt University, 2015.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines alphabetic skills, academic achievement, oral comprehension skills, and general mathematics achievement outcomes. The study also examined self-regulation outcomes, child behavior outcomes and classroom observation measures.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines the Tools of the Mind curriculum.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study is a RCT with high attrition, but the treatment and comparison group in the analytic sample satisfy the baseline equivalence requirement. The study does not show any statistically significant, positive impacts, but it shows statistically significant, negative impacts on two outcomes: letter-word identification and spelling.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹		
<p>5. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>8. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Hsueh, J., A. E. Lowenstein, P. Morris, S. K. Mattera, and M. Bangser. "Impacts of Social-Emotional Curricula on Three-Year-Olds: Exploratory Findings from the Head Start CARES Demonstration." OPRE Report 2014-78, Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, 2014.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines academic and social-emotional outcomes.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines the Tools of the Mind curriculum.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	This study does not show any statistically significant effects of the intervention on any relevant outcome.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Is the study or report one of the following: (a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; or</p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations or Meets What Works Clearinghouse Standards without Reservations</i>; and</p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; and</p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Mackay, P. E. "The Effects of Tools of the Mind on Math and Reading Scores in Kindergarten." *Open Access Dissertations*, 807, Dissertation manuscript, University of Massachusetts Amherst, 2013.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Study examines letter naming fluency, and academic progress in reading and math.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines Tools of the Mind, which includes a teacher-directed approach to play as teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	This is a correlational study that reports a statistically significant, negative association between participation in the Tools of the Mind curriculum and reading academic progress. The study does not report any statistically significant, positive effects of the intervention.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study reports a statistically significant, unfavorable effect of the intervention, and no statistically significant, positive effects of the intervention.
5. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; or</p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the <i>WWC Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; or</p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on the basis of your own study review using Version 3.0 of the <i>WWC Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; and</p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i>; and</p>		

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest:		
<input type="checkbox"/> <i>Promising Evidence</i> (1 through 4 must be “Yes”)		
<input type="checkbox"/> <i>Moderate Evidence</i> (1 through 7 must be “Yes”)		
<input type="checkbox"/> <i>Strong Evidence</i> (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Rodgers, M. S. "Structured Play and Student Learning in Kindergarten: An Outcome Evaluation Dissertation manuscript, Northeastern University, 2012.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined students' scores on the Dynamic Indicators of Basic Early Literacy Skills (DIBELS).
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined teacher-directed play as a teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); or (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); or (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study does not include a comparison group.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Is the study or report one of the following: (a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); or	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; or</p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on the basis of your own study review using Version 3.0 of the <i>WWC Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on the basis of your own study review using Version 3.0 of the <i>WWC Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; and</p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i>; and</p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Solomon, T., A. Plamondon, A. O'Hara, H. Finch, G. Goco, P. Chaban., L. Huggins, B. Ferguson, and R. Tannock. "A Cluster Randomized-Controlled Trial of the Impact of the Tools of the Mind Curriculum on Self-Regulation in Canadian Preschoolers." *Frontiers in Psychology*, vol. 8, 2018, pp. 1-18.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines receptive vocabulary, expressive vocabulary, letter recognition, counting principles, developmental progress, executive functioning, and positive and negative child behavior outcomes.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines Tools of the Mind.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study uses a RCT design, but it does not report any statistically significant impact on any relevant outcome.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹		
<p>5. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); or</p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; or</p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; and</p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; and</p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>8. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); or</p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; or</p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
(i) at least one relevant finding that Meets What Works Clearinghouse Standards without Reservations ; and (ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i> ; and (iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Stebler, R., F. Vogt, I. Wolf, B. Hauser, and K. Rechsteiner. "Play-Based Mathematics in Kindergarten. A Video Analysis of Children's Mathematical Behaviour While Playing a Board Game in Small Groups." Posted at the Zurich Open Repository and Archive, University of Zurich, 2013 (originally published at the *Journal für Mathematik-Didaktik*, vol. 34, no. 2, 2013, pp. 149-175).

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study examined students' mathematical behavior and peer interactions while they played a game.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined teacher-directed play as a teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study does not include a comparison group.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p>		

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Trawick-Smith, J., S. Swaminathan, and X. Liu. "The relationship of teacher–child play interactions to mathematics learning in preschool." *Early Child Development and Care*, vol. 186, no. 5, 2016, pp. 716-733.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined students' number skills and knowledge of math concepts.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined teacher-directed play as a teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study does not include a comparison group.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Is the study or report one of the following: (a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a "potentially positive" effect	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <i>or</i></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Vogt, F., B. Hauser, R. Stebler, K. Rechsteiner, and C. Urech. "Learning through play - pedagogy and learning outcomes in early childhood mathematics." *European Early Childhood Education Research Journal*, vol. 26, no. 4, 2018, pp. 589-603.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines scores on a test of early mathematical competencies such as ordinality, cardinality, quantity, number knowledge and first arithmetic operations skills.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines teacher-directed play as a teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study does not report any statistically significant and positive impacts of the intervention on any relevant outcomes.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>5. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results?¹</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>8. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i> ; <u>and</u> (iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Youmans, A. S., J. R. Kirby, and J. G. Freeman. "How effectively does the full-day, play-based kindergarten programme in Ontario promote self-regulation, literacy, and numeracy?" *Early Child Development and Care*, vol. 188, no. 12, 2018, pp. 1788-1800.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines numeracy, literacy, and self-regulation outcomes.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines teacher-directed play as a teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study uses a QED. It does not report any statistically significant impact on any relevant outcome.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Is the study or report one of the following: (a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a "potentially positive" effect	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Fisher, K. R., K. Hirsh-Pasek, N. Newcombe, and R. M. Golinkoff. "Taking Shape: Supporting Preschoolers' Acquisition of Geometric Knowledge Through Guided Play." *Child Development*, vol. 84, no. 6, 2013, pp. 1872-1878.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	This study reports on shape knowledge (number of times the student identified shapes correctly as real or not real shapes).
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	This study examines child-directed play and teacher-directed play.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study does not meet WWC Standards because it is a RCT that is compromised and has high attrition, and the analytic treatment and control groups in the study do not satisfy the baseline equivalence requirement. For child-directed play, the study does not report any statistically significant, positive impacts on at least one relevant outcome. For teacher-directed play, the study reports a statistically significant effect on shape identification skills.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	For teacher-directed play, the favorable

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹		impact shown in this study is overridden by the two unfavorable impacts shown in Farran et al. 2015.
5. Is the study or report one of the following: (a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u> (c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i> , or on the basis of your <i>own</i> study review using Version 3.0 of the WWC <i>Handbook</i> ² — (i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i> ; <u>and</u> (ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i> ; <u>and</u> (iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following: (a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u> (c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
<p>9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results?¹</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>Mark the highest level of evidence provided by this study or report for the intervention or practice of interest:</p> <p><input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”)</p> <p><input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”)</p> <p><input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)</p>		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Cavanaugh, D. M., K. J. Clemence, M. M. Teale, A. C. Rule, and S. E. Montgomery. "Kindergarten Scores, Storytelling, Executive Function, and Motivation Improved through Literacy-Rich Guided Play." *Early Childhood Education Journal*, vol. 45, 2017, pp. 831-843.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study focused on early literacy skills (phonemic awareness, phonics, vocabulary) as measured by the Dynamic Indicators of Basic Early Literacy Skills (DIBELS).
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined a child-directed play as a teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study uses a QED that did not satisfy the baseline equivalence requirement for the treatment and comparison groups in the analytic sample. The study does not show statistically significant, positive impacts on at least one relevant outcome.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹		
5. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
(a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u> (c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i> , or on the basis of your own study review using Version 3.0 of the <i>WWC Handbook</i> ² — (i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i> ; <u>and</u> (ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i> ; <u>and</u> (iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
(a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u> (c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i> , or on the basis of your own study review using Version 3.0 of the <i>WWC Handbook</i> ² — (i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i> ; <u>and</u>		

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i> ; <u>and</u> (iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Lindsey, M. D. "The Interrelationship of Pre-Kindergarten Writing and an Early Childhood Play Environment." Dissertation manuscript, Oklahoma State University, 2016.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined writing exploration and conventional writing, assessed from classroom observations and interviews with children.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined child-directed play as a teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study does not include a comparison group.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p>		

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Trawick-Smith, J., S. Swaminathan, B. Baton, C. Danieluk, S. Marsh, and M. Szarwacki.
 “Block play and mathematics learning in preschool: The effects of building complexity, peer and teacher interactions in the block area, and replica play materials.” *Journal of Early Childhood Research*, vol. 15, no. 4, 2017, pp. 433-488.

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examines students’ math skills, including patterns, geometry, and measurement.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	The study examined child-directed play as a teaching strategy.
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study does not include a comparison group.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>		
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8. Is the study or report one of the following:	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the WWC <i>Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the WWC <i>Handbook</i>, or on the basis of your own study review using Version 3.0 of the WWC <i>Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the WWC <i>Handbook</i>; <u>and</u></p>		

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the WWC <i>Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

ASSESSMENT OF THE LEVEL OF EVIDENCE PROVIDED BY A STUDY OR REPORT

(Version 2.1, 13 February 2017)

ED contract supporting review: REL Mid-Atlantic

Relevant outcome(s) of interest: Academic (literacy and math) outcomes

Target population(s) of interest: Students in Pre-Kindergarten through Grade 3 settings

Intervention(s) or practice(s) of interest: Play as a teaching strategy

Study or report: Youngblood, C. K. "Kindergarten Literacy Readiness Before and After HighScope Implementation." Dissertation manuscript, Walden University, 2017.

REQUIREMENTS (answer each question until an answer is "No")	CHECKLIST	JUSTIFICATION
1. Does the study or report include at least one outcome of interest to the stakeholder, <u>and</u> that is included in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Study examined letter identification, sound identification, and reading level outcomes.
2. Does the study or report include an intervention or practice of interest to the stakeholder or that is designed to affect an outcome in (1), <u>and</u> that is shown in a theory of action (i.e., logic model) prepared by, or provided for, the stakeholder?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Study examined the HighScope curriculum, which includes student planning, small and large group instruction, and outdoor play and work (including child-directed play or free play).
3. Is the study or report one of the following: (a) a practice guide prepared by the WWC reporting a "moderate" evidence base or a "strong" evidence base for a recommendation on a practice in (2); <u>or</u> (b) an intervention report prepared by the WWC reporting a "potentially positive" effect or a "positive" effect of an intervention in (2) on a relevant outcome in (1); <u>or</u> (c) a study or report investigating the impact of an intervention or practice in (2) on a relevant outcome in (1) that (i) uses <i>either</i> an experimental design eligible for the highest WWC rating (i.e., a randomized controlled trial [RCT], regression discontinuity design [RDD], or single-case design [SCD]), <i>or</i> a quasi-experimental design [QED], <i>or</i> a correlational design comparing outcomes for an intervention group and a comparison group and using statistical controls for selection bias; <u>and</u> (ii) reports a statistically significant and positive (i.e., favorable) impact of the intervention in (2) on at least one relevant outcome in (1)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	The study used a correlational design that compared outcomes for an intervention group and a comparison group, but it did not use statistical controls for selection bias.
4. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified at the same time for review on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least	<input type="checkbox"/> Yes <input type="checkbox"/> No	.

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
one relevant finding or practice recommendation identified in (3) that remains and is <u>not</u> overridden by any unfavorable results? ¹		
<p>5. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “moderate” evidence base or a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “potentially positive” effect or a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study or quasi-experimental design [QED] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on the basis of your <i>own</i> study review using Version 3.0 of the <i>WWC Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards with Reservations</i> or <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p> <p>(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i>; <u>and</u></p> <p>(iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample?³</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6. Is at least one relevant finding or practice recommendation satisfying (5) based on a sample that overlaps with a target population <u>or</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Taking into account any statistically significant and negative (i.e. unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2)—is there at least one relevant finding or practice recommendation identified in (6) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>8. Is the study or report one of the following:</p> <p>(a) a practice guide prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “strong” evidence base for a recommendation on a practice in (2); <u>or</u></p> <p>(b) an intervention report prepared by the WWC using Version 2.1 or higher of the <i>WWC Handbook</i> reporting a “positive” effect of an intervention in (2) on a relevant outcome in (1) based on a “medium to large” extent of evidence; <u>or</u></p> <p>(c) an experimental [RCT, RDD, or SCD] study investigating the impact of an intervention in (2) on a relevant outcome in (1) with—on the basis of a review reported on the WWC website and prepared under Version 2.1 or higher of the <i>WWC Handbook</i>, or on the basis of your own study review using Version 3.0 of the <i>WWC Handbook</i>²—</p> <p>(i) at least one relevant finding that <i>Meets What Works Clearinghouse Standards without Reservations</i>; <u>and</u></p>	<input type="checkbox"/> Yes <input type="checkbox"/> No	

REQUIREMENTS (answer each question until an answer is “No”)	CHECKLIST	JUSTIFICATION
(ii) at least one relevant finding in (5)(c)(i) that is statistically significant and positive (i.e., favorable) after applying any corrections specified in the <i>WWC Handbook</i> ; <u>and</u> (iii) at least one relevant finding in (5)(c)(ii) that is from a large sample and a multi-site sample? ³		
9. Is at least one of relevant finding or practice recommendation satisfying (8) based on a sample that that overlaps with a target population <u>and</u> an education setting specified by the stakeholder?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
10. Taking into account any statistically significant and negative (i.e., unfavorable) impacts of the intervention or practice in (2) on relevant outcomes in (1)—either in the study or report itself, or in another study or report identified for review at the same time on the <i>same</i> intervention or practice, or in a WWC report prepared under Version 2.1 or higher of the <i>WWC Handbook</i> on the intervention or practice in (2) —is there at least one relevant finding or practice recommendation identified in (9) that remains and is <u>not</u> overridden by any unfavorable results? ¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Mark the highest level of evidence provided by this study or report for the intervention or practice of interest: <input type="checkbox"/> Promising Evidence (1 through 4 must be “Yes”) <input type="checkbox"/> Moderate Evidence (1 through 7 must be “Yes”) <input type="checkbox"/> Strong Evidence (1 through 10 must be “Yes”)		

Appendix C. Literature Search Terms and Databases

Table C.1. Literature search terms

Category	Search terms	
Curriculum or practice	Play + learn* Guided play Directed play Play-based learning Play pedagogy Game-based learning Game-based pedagogy Active engagement Active learning Hands-on learning Experiential learning	Active learning Multisensory learning Project-based learning Supportive perspective taking Tools of the Mind Readers' Theater Games for Learning Project Approach Reggio Emilia Playful learning
Outcomes	Academic Cognit* Math* Arithmetic Counting Fractions Measure* Number* Numer* Pattern Problem solving Reasoning Science Social studies Alphabetic Compreh*	Decoding ELA Fluency Language Letter identification Lexicography Literacy Phonemic Phonetics Phonics Phonological Print awareness Print knowledge Reading Verbal development Vocabulary Word recognition
Population	Student 1st grade* 2nd grade* 3rd grade* 4 year* old* 5 year* old* 6 year* old* 7 year* old* 8 year* old* Age* 4 Age* 5 Age* 6 Age* 7 Age* 8	Pre-k* Prekindergarten Preschool Elementary school* Grade school* Primary grades Early years Primary school* Kindergarten* First grade* Second grade* Third grade* Grade* 1 Grade* 2 Grade* 3

Category	Search terms	
Impact	Achiev*	Gain
	Affect*	Growth
	Benefit*	Impact*
	Compar*	Improve*
	Decreas*	Increas*
	Difference	Progress
	Effect*	Reduc*
	Efficac*	Success*

Note: We searched for studies that mentioned one or more terms in each category in the title or abstract. Asterisks (*) are placed next to search terms to help broaden the search to any words that start with the same letters. That is, the asterisks are used as a “wildcard” symbol that helps retrieve variations of a term with less typing.

Databases and other sources

For this review, we searched the electronic databases listed in Appendix B of the WWC Procedures and Standards Handbook. We also searched the websites of the following organizations:

- Abt Associates
- Alliance for Excellent Education
- American Association of Colleges of Teacher Education
- American Association of School Administrators
- American Education Research Association
- American Enterprise Institute
- American Evaluation Association
- American Federation of Teachers
- American Institutes of Research
- American Mathematical Society
- American Statistical Association
- Association for Public Policy Analysis and Management
- Association for Supervision and Curriculum Development
- Best Evidence Encyclopedia
- Broad Foundation (Education)
- Brookings Institution
- Campbell Collaboration, C2-SPECTR
- Carnegie Corporation of New York
- Center for Comprehensive School Reform and Improvement
- Center for Data-Driven Reform in Education at Johns Hopkins University
- Center for Research and Reform in Education
- Center for Research in Educational Policy
- Center for the Study of Instructional Improvement
- Center on Education Policy
- Center on Instruction
- Congressional Research Service
- Consortium for Policy Research in Education
- Council of Chief State School Officers
- Council of the Great City Schools
- Editorial Projects in Education Research Center
- Erikson Institute, University of Chicago
- Geometry, Reasoning, and Instructional Practices
- Government Accountability Office
- Grants/contracts awarded by the Institute of Education Sciences
- Harvard Graduate School of Education
- Heritage Foundation
- Hoover Institution
- ICF International
- Johns Hopkins University School of Education
- Mathematica
- Mathematical Association of America
- Mathematics Teaching and Learning to Teach Project
- MDRC
- Mid-Continent Research for Education and Learning
- Millennium Mathematics Project
- National Association for the Education of Young Children
- National Association of Elementary School Principals
- National Association of Secondary School Principals
- National Association of State Boards of Education
- National Board for Professional Teaching Standards

- National Center for Children in Poverty
- National Center for Education Research
- National Center for Research on Early Childhood Education
- National Center for Special Education Research
- National Conference of State Legislatures
- National Council of Supervisors of Mathematics
- National Council of Teachers of Mathematics
- National Education Association
- National Governors' Association
- National Head Start Association
- National Institute of Child Health and Human Development
- National Math Panel
- National Reading Panel
- National Science Foundation
- National Bureau of Economic Research working papers
- New America Foundation's Early Education Initiative
- Pacific Resources for Education and Learning
- Policy Archive
- Policy Study Associates
- Promising Practices Network
- Public Education Network
- Public Policy Research Institute at Texas A&M University
- RAND
- Regional Educational Laboratories
- Society for Research in Child Development
- Southwest Educational Development Laboratory
- Southwest Educational Development Laboratory
- SRI
- Technical Assistance Center on Social Emotional Intervention for Young Children
- TERC
- The National Academies Press
- Thomas B. Fordham Institute
- U.S. Department of Education Office of Early Learning
- U.S. Department of Health and Human Services