



# Implementation Development Map: Literature Review for Research-Based Curriculum

October 2021

Megan Hague Angus, Rebecca Kleinman, Jessica F. Harding

---

**Submitted to:**

Bill & Melinda Gates Foundation  
P.O. Box 23350  
Seattle, WA 98102  
Phone: (206) 709-3100  
Program Officer: Sarah Weber

**Submitted by:**

Mathematica  
P.O. Box 2393  
Princeton, NJ 08543-2393  
Phone: (609) 799-3535  
Project Director: Jessica F. Harding

**This page has been left blank for double-sided copying.**

## Literature Review for Research-Based Curriculum (RBC)

In this document, we summarize our literature review on the Research-Based Curriculum (RBC) element of the Implementation Development Map (IDM). We start with an overview, then provide a bulleted list that summarizes the strength of support from professional/expert recommendations and the research literature, and we discuss whether the research speaks to equity. Following the detailed notes are two graphics that summarize, for each IDM indicator, the strength of (1) the research evidence and (2) the support from expert recommendations and professional best practices. The appendix describes our literature search and review process.

### A. Overview

RBC is one of seven elements identified in the IDM. RBC is defined as supporting early childhood professionals' use of a developmentally appropriate curriculum that contributes to children's achievement and well-being. The IDM notes that to implement an RBC to fidelity, there needs to be professional training and funding to support effective implementation. Like other elements of the IDM, RBC has two types of indicators: those that are about infrastructure at the state level (six indicators) and those about implementation at the local level (six indicators). Infrastructure indicators focus on state policy, supports, and data systems related to research-based curricula. Implementation indicators capture the degree to which research-based curricula are being implemented with fidelity, if the fidelity of implementation is assessed, and if teachers receive trainings and supports about curriculum implementation. The final two indicators address whether programs use data obtained from a research-based curriculum fidelity tool and families have opportunities to learn about and offer feedback about the selected curriculum.

At the request of the Bill & Melinda Gates Foundation, Mathematica conducted a systematic literature review focused on RBC. (The full methodology is in the appendix.) For the RBC element, after screening the studies collected for the literature review, we identified and reviewed 12 studies published since the beginning of 2001 to assess their quality and key findings. For this element, 6 studies supported at least one IDM indicator. Despite the limited availability of high quality research, we caution readers against drawing conclusions about the inherent value of an IDM indicator. Readers should not conclude that a lack of high quality studies means that the indicator does not have valuable, nuanced information to offer about how to strengthen state systems.

Because the IDM is a tool designed to improve state systems, we also determined which elements and indicators were supported by professional best practice standards and expert recommendations. (The box on the first page defines high quality, best practice standards, and expert recommendations; see the

#### Definitions

**Research strength** is based on the number of *high quality studies* with favorable effects on child or teacher outcomes.

- High quality studies are those in which the design is strong enough to suggest that outcomes can be attributed to the intervention, practice, or policy that is being studied.

**Practice strength** is based on whether the indicator is supported by professional best *practices or expert recommendations*.

- Professional best practice standards include the Head Start Performance Program Standards (HSPPS) and the standards set forth by the National Association for the Education of Young Children (NAEYC).
- Expert recommendations are from the National Academy of Sciences, Engineering, and Mathematics (NASEM). ▲

appendix for full definitions and a description of how we rated these dimensions to determine the overall research strength and practice strength of each IDM indicator.)

The IDM tool explicitly embeds equity into the indicators to ensure state leaders continue to value diverse groups of learners and teachers and provides high quality learning opportunities for all children. In our literature review, we examined equity by describing and placing value on studies that include students and teachers with diverse characteristics. We have captured whether the samples in high quality studies with favorable effects include dual language learners (DLLs), children whose families have low incomes, and children and teachers of racially and ethnically diverse backgrounds. Research that explicitly addresses questions of equity is limited, however, despite its importance for state systems that serve children from disadvantaged backgrounds.

## **B. Details of support for indicators**

In this section, we describe the strength of support the indicators have from the research literature or the recommendations of professionals and experts. We detail the high quality studies with favorable effects, the parts of the indicator supported by the study, and any themes in the results that concern outcomes of children or teachers. We report whether any studies are particularly relevant to a specific IDM indicator and whether the research addresses equity, particularly whether studies were based on diverse samples or showed effects for certain groups of children or teachers. If there are no studies related to an indicator (Figures 2 and 4), we do not discuss it.

**IDM RBC 1. There is policy in place that requires all publicly, state-funded prekindergarten programs to implement a research-based curriculum that aligns with state early learning guidelines and includes the following five characteristics:**

- **Research-based**
- **Aligned with state early learning guidelines**
- **Culturally and linguistically responsive content**
- **Supportive of individualized instruction for children with a range of abilities**
- **Allows for actively engaging families to connect and extend learning opportunities across home and school, e.g., families have the opportunity to learn about and provide feedback on selected curricula and instructional materials used in classrooms.**

*Research strength:*

- One study, which evaluated an Early Reading First program, incorporated a research-based curriculum as a requirement of federal policy. The U.S. Department of Education's Early Reading First program requires local education agencies or preschool grant recipients to adopt a research-based curriculum. In the study reviewed, the intervention schools adopted the curriculum *Opening the World of Learning*, along with teacher training, and the curriculum showed favorable effects on children's English literacy skills.

*Practice strength:*

- The professional and expert recommendations partially support this indicator. The professional recommendations support requiring programs to implement research-based curricula that align with

state early learning and development standards and the Head Start Early Learning Outcomes Framework. Although professionals also note that the program must deliver developmentally, culturally, and linguistically appropriate learning experiences, they do not say the curriculum needs to include all five of the characteristics. The expert recommendations partially support the concept that federal and state agencies develop research-based curricula, but do not state the curriculum should include the remaining four characteristics.

**IDM RBC 2. State provides resources (funding, written guidance, training, and materials) to support teachers in research-based curriculum implementation. Resources are distributed equitably (e.g., writing guidance is available in multiple languages, and is Section 508 compliant, training is accessible and available in multiple languages that represent the field or in various mediums and is equitably distributed regionally).**

*Practice strength:*

- Professional recommendations partially support this indicator by encouraging supports for teachers to implement the curricula but do not offer guidance on ensuring that supports are equitably distributed to teachers. Nor do expert recommendations include information about the role training plays in implementing a research-based curriculum or speak to ensuring that supports are equitably distributed to teachers.

**IDM RBC 3. State requires teachers to be trained in the research-based curriculum they are implementing and for programs to provide ongoing, practice-based implementation supports (e.g., technical assistance and ongoing coaching, modelling, and/or mentoring in research-based curriculum with opportunities for self- and peer-reflection.) Training also includes ways to modify the curriculum for children with special needs and for dual language learners (DLLs).**

*Research strength:*

- The study that examined an Early Reading First program included professional development and in-class coaching for teachers. As required by federal Early Reading First policy, preschool programs or local education agencies that receive Early Reading First grants must incorporate professional development for teachers. The training, which included large and small group sessions and classroom support once or twice per week from a coach, covered the curriculum, support for emergent writers, and support for dual language learners. There were favorable effects on children's literacy skills, including for a subgroup of children who were dual language learners; there were no effects on oral comprehension, however.

*Practice strength:*

- Professional recommendations partially support this indicator by encouraging programs to support teachers' curricula implementation through supervision, training, and professional development. The professional recommendations value learning experiences for children that are developmentally, culturally, and linguistically appropriate, although they do not mention training teachers to modify curricula for this purpose. Expert recommendations do not discuss this topic.

**IDM RBC 4. State requires programs to train their early childhood educators in how to use a research-based curriculum implementation fidelity tool and to employ this tool to ensure that curricula are being used as intended. State requires programs to assess curriculum implementation fidelity at least twice a year, and State requires programs to use curriculum fidelity data to provide ongoing feedback to early childhood educators**

*Practice strength:*

- Professional recommendations support requirements for programs to monitor curriculum implementation fidelity but do not give guidance on using a fidelity tool, specifically. Expert recommendations do not encompass curriculum fidelity. Neither professional nor expert recommendations discuss how often to assess curriculum fidelity or how to use the information collected.

**IDM RBC 5. To understand fidelity of implementation and for continuous quality improvement, the state monitors and verifies classroom-level data collection on the fidelity of research-based curriculum implementation, including cultural and linguistic responsiveness, and individualization for children with a range of abilities through on-site observation with a fidelity tool at least once a year. State requires programs to use implementation fidelity data in addition to other sources of data to inform improvement plans and track progress and uses the data to make decisions that guide the provision of technical assistance and resources to local programs.**

*Practice strength:*

- Professional and expert recommendations partially support this indicator. Both encourage programs to monitor curriculum fidelity and use fidelity monitoring as part of continuous quality improvement to promote accountability. However neither address whether programs should monitor fidelity for cultural and linguistic responsiveness or individualization for children who have a range of abilities

**IDM RBC 6. With regard to state policies and practices around pre-K curriculum such as selection of a research-based curriculum, curriculum implementation training for teachers, and resource allocation, the state monitors implementation and outcomes through data collection, and uses data to make equitable decisions that ensure all teachers are able to implement curriculum with fidelity and in ways that are linguistically and developmentally appropriate for all children. The state's efforts to understand and address inequity regarding curriculum include ongoing data collection and analysis, disaggregation of data, active discussions, data-driven decision making, action planning, implementation, assessing implementation, and refining, as needed. The state specifically collects and uses data to understand and address the following five components:**

- **Programs adopt curriculum that is research based, culturally and linguistically affirming, and supportive of individualized instruction for children with a range of abilities.**
- **Programs engage with families in their home languages in order to connect and extend learning opportunities across home and school (e.g., families have the opportunity to learn about and provide feedback on selected curricula and instructional materials used in classrooms).**
- **Programs and teachers have access to curriculum fidelity implementation training. Access includes training available in multiple languages, in multiple mediums, and locations.**

- **Resources are distributed equitably (e.g., writing guidance is available in multiple languages, and is 508 compliant, funding is targeted toward those most in need of support).**
- **Teachers are trained in the research-based curriculum and on how to modify the curriculum to meet the needs of children at varying stages both linguistically and developmentally.**

*Practice strength:*

- Neither the professional nor expert recommendations address or support the state-level collection and monitoring of curriculum implementation data or using the data to understand or promote equity.

**IDM RBC 7. Classrooms implement a research-based curriculum, and inclusive practices that align with state standards. The curriculum includes the following five characteristics:**

- **Research-based**
- **Aligned with state standards that are based on early learning guidelines**
- **Culturally and linguistically responsive content**
- **Supportive of individualized instruction for children with a range of abilities**
- **Allows for actively engaging families to connect and extend learning opportunities across home and school (e.g., families have the opportunity to learn about and provide feedback on selected curricula and instructional materials used in classrooms).**

*Research strength:*

- Six studies that examined a research-based curriculum adopted by classrooms showed favorable effects on children, classroom quality, or teaching practices. Five of these studies found favorable effects on preschoolers, including enhanced academic outcomes (such as math skills) and social and emotional development (such as social adjustment and aggressive-oppositional behavior) when preschoolers were offered a research-based curriculum. Two of the studies also found favorable effects on the classroom environment or teaching practices. Four of the five studies were evaluations of the Head Start Research-Based, Developmentally Informed preschool intervention, which includes a curriculum aligned with Head Start standards.
- The study of an Early Reading First program supplemented the core curriculum for dual language learners by offering additional resources and supports. The program extended learning into homes by sending children home with books and exercises for parents and children to do together; teachers worked with family members, community organizations, and businesses to incorporate environmental print into activity centers and classroom displays using both the children's home languages and English; and children could take home curriculum-related books in English and common native languages. There were favorable literacy effects for both dual language learners and children whose first language is English.
- The majority of these studies focused on children from low-income families as well as on racially/ethnically diverse backgrounds. One focused on dual language learners. These studies illustrate the favorable effects of using a research-based curriculum with diverse samples of children.

*Practice strength:*

- The professional and expert recommendations partially support this indicator by noting some, but not all, of the five characteristics. Professional recommendations state that programs should implement research-based curricula that are developmentally and linguistically appropriate and aligned with state early learning and development standards. Experts also recommend that programs use curricula rooted in current scientific understanding of children's learning.

**IDM RBC 8. Classrooms have trained lead teachers in the research-based curriculum they are implementing including ways to modify the curriculum to meet a range of abilities for all children in the program including children with developmental delays and disabilities, and DLLs.**

*Research strength:*

- The same six studies showing favorable effects for indicator 7 described the training that was provided to teachers. The interventions included multiple days of training and professional development to support their implementation of the curricula. All six of the studies described offering teachers a multiday, in-service training, and additional supports to train teachers in research-based curricula. These studies found favorable effects on preschoolers when teachers were trained in research-based curricula, including improved academic outcomes (such as math skills) and social and emotional development (such as social adjustment and aggressive-oppositional behavior). Two of the studies also found favorable effects on the classroom environment or teaching practices.
- One of the studies included training and supports for teachers to supplement the curriculum for dual language learners. Teachers received training and coaching in implementing best practices for dual language learners and culturally relevant adaptations to curriculum and learning center activities. There were favorable literacy effects for dual language learners.
- The six studies included children from low-income families and racially/ethnically diverse backgrounds; one also included dual language learners.. These studies illustrate the favorable effects of training teachers to implement a research-based curriculum with diverse samples of children.

*Practice strength:*

- The professional recommendations encourage teacher professional development focused on effective curriculum implementation. The HSPPS note that training teachers about the curriculum and research-based approaches should also include training teachers about how best to partner with families who have children with disabilities and supporting dual language learners as appropriate. Expert recommendations do not address strategies or approaches to train teachers using a research-based curriculum.

**IDM RBC 9. Programs train their early childhood educators on the use of a research-based curriculum fidelity tool.**

*Research strength:*

- Four studies examined the effects of implementing a research-based curriculum on children's outcomes and teachers' practices. One component of those interventions was to collect teachers' assessments of the fidelity of the intervention, including their own fidelity to the curriculum. The teachers in the studies were trained to make these assessments, and coaches also observed classrooms

to assess teachers' curriculum fidelity. The studies found favorable effects on preschoolers, including on academic outcomes (such as math skills) and social and emotional development (such as social adjustment and aggressive-oppositional behavior). The single study that examined teacher outcomes found favorable effects on teachers' emotional, behavioral, and linguistic support for children.

- The four studies included children from low-income families and racially/ethnically diverse backgrounds. These studies illustrate the favorable effects of training teachers to use a research-based curriculum fidelity tool with diverse samples of children.

*Practice strength:*

- Neither professional nor expert recommendations support this indicator. They do not mention training staff in the use of a curriculum fidelity tool.

**IDM RBC 10. Programs assess the research-based curriculum implementation fidelity.**

*Research strength:*

- Four studies examined the effects of implementing a research-based curriculum on children's outcomes and teachers' practices. In these four studies, teachers self-assessed their curriculum fidelity, and coaches who supported the teachers also assessed the teachers' fidelity. The studies found favorable effects on preschoolers, including on academic outcomes (such as math skills) and social and emotional development. One of the studies, for example, found favorable effects on children's executive function and academic outcomes among children who started out with lower executive function, and another study reported favorable outcomes for children's social adjustment and academic engagement. The single study that examined teacher outcomes found favorable effects on teachers' emotional, behavioral, and linguistic support for children.
- The four studies included primarily low-income children who were racially and ethnically diverse. These studies illustrate the favorable effects of providing teachers with training to self-assess the fidelity to a research-based curriculum in classrooms with diverse samples of children.

*Practice strength:*

- Professional recommendations support requiring programs to monitor the fidelity of curriculum implementation. Expert recommendations do not address curriculum fidelity.

**IDM RBC 11. Programs use annual data obtained from the research-based curriculum fidelity tool for continuous program quality improvement.**

*Practice strength:*

- The professional recommendations support the concept that programs should monitor curriculum fidelity and provide staff with support, feedback, and supervision to continuously improve curriculum implementation. The expert recommendations do not mention using the data from the curriculum fidelity tool for program improvement.

**IDM RBC 12. Families have the opportunity to learn about and provide feedback on selected research-based curricula and instructional materials used in classrooms.**

*Practice strength:*

- The professional recommendations partially support this indicator. HSPPS encourage parents to have a voice in decisions about what children do in their classrooms through the formation of a policy council. The expert recommendations value the role parents play in complementing early learning at home, but they do not address the role parents play in providing feedback on the curriculum.

### **C. Overall ratings of research and practice support for indicators**

Figures 1 and 2 summarize the overall strength of the research and practice support for each RBC indicator.

**Figure 1. Indicator key for overall ratings of research and practice strength**

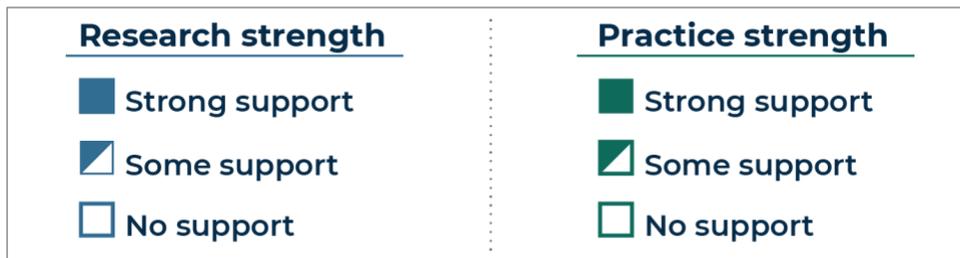


Figure 2. Overall ratings of reseach and practice strength

Research-Based Curriculum	Research strength	Practice strength
1 Curriculum Policy		
2 Curriculum Resources		
3 Curriculum Training		
4 Curriculum Fidelity Training		
5 Curriculum Data		
6 RBC Data Collection and Use for Equity Goals		
7 Curriculum Implementation		
8 Curriculum Training		
9 Implementation of Curriculum Training		
10 Assess Curriculum Fidelity Implementation		
11 Curriculum Data Use		
12 Curriculum Feedback		

## D. Detailed ratings of research and practice support for indicators

Figures 3 and 4 give additional detail on the research and practice support for each IDM indicator.

**Figure 3. Indicator key for detailed ratings of research and practice strength**

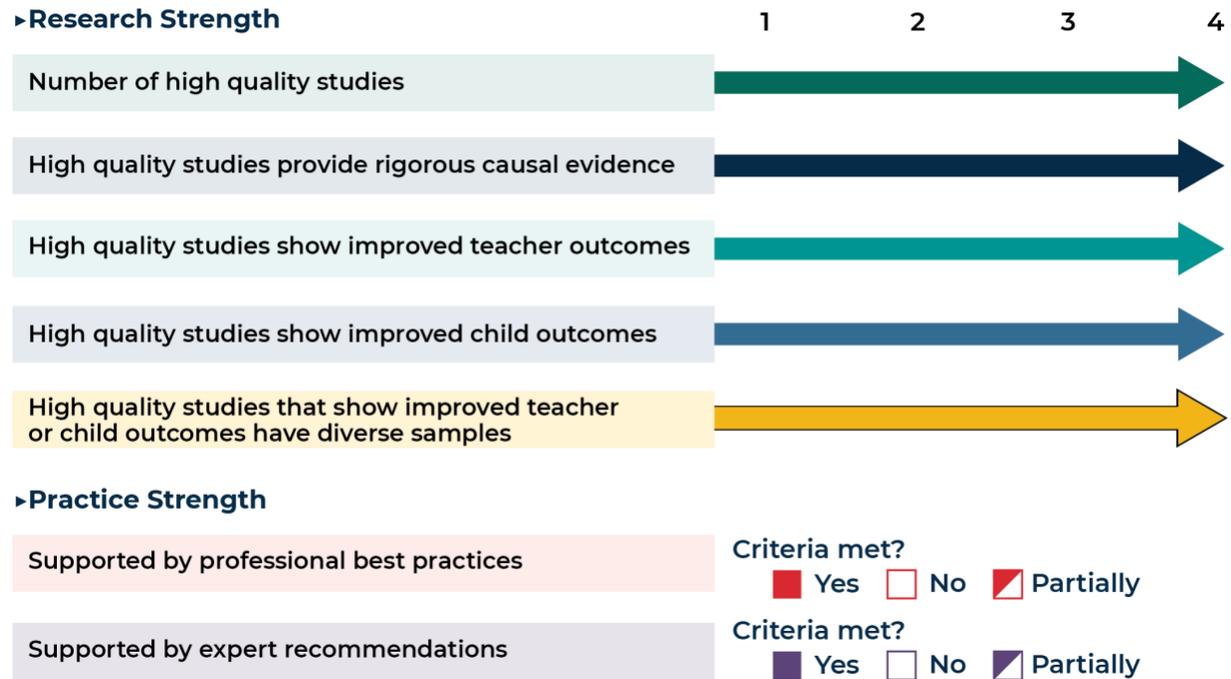
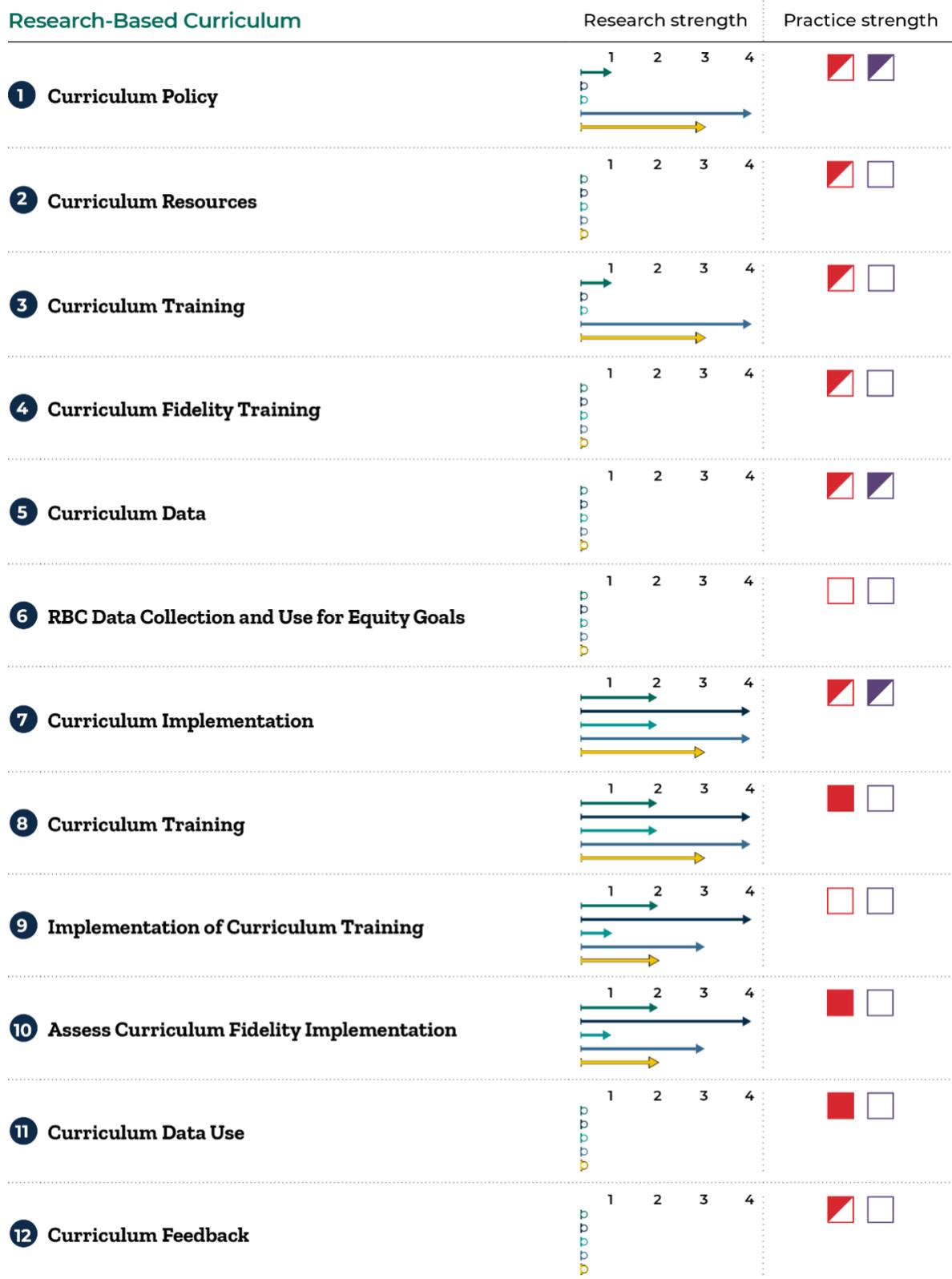


Figure 4. Detailed ratings of reseach and practice strength



## Appendix

### A. Identifying literature

Mathematica staff reviewed the literature on the use of research-based curriculum in preschool classrooms. We worked with our professional librarians to develop targeted search terms. We then searched eight databases for published articles.<sup>1</sup> Using the information in the abstracts, we screened out studies that did not meet our inclusion criteria. All eligible studies had to meet the following criteria:

- Based in the United States
- Focused on children ages 3 to 5
- Implemented in a prekindergarten setting (Head Start, child care center, or state prekindergarten program)
- Evaluated child or teacher/classroom outcomes using a randomized controlled trial, quasi-experimental, or correlational design
- Published in 2001 or later

We procured the full text of the eligible studies. Next, we screened the studies again to identify whether the studies mapped to any of the Implementation Development Map (IDM) indicators and to confirm that the studies met our inclusion criteria. We screened out any studies that did not focus on an IDM indicator (Table A.1). For the RBC element, after examining the full texts of the 21 studies initially identified, 12 met the inclusion criteria, 6 were rated high quality, and all 6 of the high quality studies had at least one favorable outcome (see the reference list for the high quality studies).

**Table A.1. Number of studies identified and reviewed for each IDM element**

IDM element	Studies identified	Studies fully reviewed	High quality studies	High quality studies with favorable outcomes
Research-based curriculum	21	12	6	6

### B. Assessing support for IDM indicators

We assessed each indicator on seven dimensions (Tables A.4 and A.5) to summarize the support for the indicator in the research and professional/expert recommendations.

To identify high quality studies, reviewers rated the rigor of the study design (Dimensions 1 and 2). To identify whether the studies show an improvement in outcomes, reviewers summarized the study impacts on children or teachers (Dimensions 3 and 4). To identify the extent to which high quality studies provided evidence of improvements with diverse groups of children and teachers, reviewers examined the groups of children and teachers included in the studies (Dimension 5). To determine the extent to which professional best practices and expert recommendations supported the indicators, we reviewed key practice documents (Dimensions 6 and 7). Below, we describe each step.

<sup>1</sup> The eight databases are Academic Search Premier, APA PsycInfo, Cochrane Database of Systematic Reviews, Education Research Complete, ERIC, ProQuest Dissertations, SAGE Journals, and Scopus.

## 1. Rating study quality

We wanted to identify studies with results we could be confident were valid. We categorized studies as those that provide rigorous causal evidence, strong evidence, or low quality evidence (Table A.2).

**Table A.2. Study quality ratings**

Study rating	Description
Provides rigorous causal evidence <sup>a</sup>	Well-conducted randomized controlled trials with limited attrition (< 20 percent) and no other design concerns provide the strongest evidence because outcomes can be attributed to the intervention, practice, or policy rather than to existing differences between groups.
Provides strong evidence <sup>a</sup>	<p>Studies that show that their comparison groups are similar or include relevant control variables suggest that outcomes can be attributed to the intervention, practice, or policy but that unmeasured differences might exist between groups.</p> <p>These studies could include randomized controlled trials with high attrition or quasi-experimental designs that (a) show that the comparison groups used in analysis were equivalent on demographics and a baseline measure of the outcome (or another outcome in the same domain) or (b) controls for demographics and baseline measures. These studies could also include correlational designs and ones that have a comparison group but no baseline measures, provided they use a strong set of relevant controls (including demographics and other characteristics that could influence the outcome).</p>
Provides low quality evidence	These are studies with unconvincing results. These studies could include randomized controlled trials with high attrition, quasi-experimental designs, or correlational studies that do not use adequate control variables or that have a confound such as using different data collection methods in the treatment and comparison groups.

<sup>a</sup> Both of these ratings were considered to provide high quality evidence.

We then summarized the number of high quality studies—studies that provide rigorous causal evidence and strong evidence—and the percentage of high quality studies that provide rigorous causal evidence for each indicator. Studies can support several indicators.

## 2. Rating study findings

We categorized whether the high quality studies had statistically significant effects on any child or teacher/classroom outcomes included in the studies (Table A.3).

**Table A.3. Definitions of study impacts**

Study impacts	Definition
Favorable	Significant effects on at least one outcome that benefits children or teachers/classrooms; for example, improving classroom quality
Unfavorable	Significant negative effects on at least one outcome for children or teachers/classrooms and no favorable effects on any outcomes; for example, children's receptive vocabulary scores decrease
No effect	No significant effects on any child or teacher/classroom outcomes
Mixed	At least one favorable and unfavorable effect

We next summarized for each indicator the percentage of high quality studies with favorable effects on children, teachers/classrooms, or both.

### **3. Rating whether studies include diverse samples**

For high quality studies with favorable effects on children and teachers/classrooms, we examined whether the studies included different population groups. We assessed whether studies reported that they included the following:

- Racially/ethnically diverse children (at least 25 percent of children are Hispanic, African American, or American Indian/Alaska Native)
- Racially/ethnically diverse teachers (at least 25 percent of teachers are Hispanic, African American, or American Indian/Alaska Native)
- Children who are dual language learners (DLLs) (at least 25 percent of children are DLLs)
- Children from low-income households (at least 75 percent of children are in low-income households or the educational setting is low income)

We then looked at whether each indicator has high quality studies with favorable effects with racially/ethnically diverse children, racially/ethnically diverse teachers, DLLs, and children from low-income households.

### **4. Assessing professional best practices and expert recommendations**

Because the IDM is a tool designed to improve state systems, we determined which elements and indicators were supported by professional best practice standards, including the Head Start Performance Program Standards, the standards set by the National Association for the Education of Young Children, and expert recommendations from the National Academy of Sciences, Engineering, and Mathematics. The latter organization analyzes available evidence to advance the learning and development of children, youth, and families and presents consensus recommendations that undergo peer review before publication.<sup>2</sup>

A team of researchers reviewed IDM indicators to determine how well they aligned or agreed with these professional standards. We assessed whether each indicator was supported by professional recommendations and expert recommendations by using a three-part scale that included “met,” “partially met,” or “not met.” We used “partially met” when aspects of the indicator were supported, but not necessarily when the full indicator was met, because each indicator often covers several ideas.

### **5. Assigning overall ratings on dimensions**

Based on the rating of study quality, study findings, the diversity of samples, and professional and expert recommendations, we rated each indicator on seven dimensions (Table A.4). Ratings for the research support dimensions ranged from 1 to 4; ratings for the recommendation support dimensions included met, partially met, and not met.

---

<sup>2</sup> See, for example: HSPPS, available at <https://eclkc.ohs.acf.hhs.gov/policy/45-cfr-chap-xiii/1302-32-curricula>; NAEYC, “Developmentally Appropriate Practice,” available at <https://www.naeyc.org/resources/position-statements/dap/contents>; and National Research Council, *Eager to Learn: Educating Our Preschoolers* (Washington, DC: National Academies Press, 2001).

**Table A.4. Definitions of dimension ratings**

Research support dimension	1	2	3	4
Number of high quality studies	1 to 3 high quality studies	4 to 6 high quality studies	7 to 9 high quality studies	10 or more high quality studies
High quality studies that provide rigorous causal evidence	1–25% of high quality studies provide causal evidence	26–50% of high quality studies provide causal evidence	51–75% of high quality studies provide causal evidence	76–100% of high quality studies provide causal evidence
High quality studies that show improved teacher/classroom outcomes (show at least one favorable effect on a teacher/classroom outcome and no unfavorable effects)	1–25% of high quality studies show improved teacher/classroom outcomes	26–50% of high quality studies show improved teacher/classroom outcomes	51–75% of high quality studies show improved teacher/classroom outcomes	76–100% of high quality studies show improved teacher/classroom outcomes
High quality studies that show improved child outcomes (show at least one favorable effect on a child outcome and no unfavorable effects)	1–25% of high quality studies show improved child outcomes	26–50% of high quality studies show improved child outcomes	51–75% of high quality studies show improved child outcomes	76–100% of high quality studies show improved child outcomes
High quality studies that show improved teacher/classroom or child outcomes with diverse samples	Studies include one of the following groups: racially/ethnically diverse children, racially/ethnically diverse teachers, DLLs, children from low-income households	Studies include two of the following groups: racially/ethnically diverse children, racially/ethnically diverse teachers, DLLs, children from low-income households	Studies include three of the following groups: racially/ethnically diverse children, racially/ethnically diverse teachers, DLLs, children from low-income households	Studies include four of the following groups: racially/ethnically diverse children, racially/ethnically diverse teachers, DLLs, children from low-income households

DLLs = dual language learners.

**Table A.5. Definitions of dimension ratings for practice support**

Practice support dimension	Not met	Partially met	Met
Supported by professional best practices	The indicator was not supported by the HSPPS or NAEYC	Part of the indicator was supported by the HSPPS or NAEYC	The full indicator was supported by the HSPPS or NAEYC
Supported by expert recommendations	The indicator was not supported by NASEM	Part of the indicator was supported by NASEM	The full indicator was supported by NASEM

NAEYC = National Association for the Education of Young Children; NASEM = National Academies of Sciences, Engineering, and Medicine; HSPPS = Head Start Program Performance Standards.

## 6. Assigning overall ratings on research and practice strength

To make the recommendation support rating even more accessible, we summarized two dimensions of support: research strength and practice strength (Table A.6).

**Table A.6. Definitions of research and practice strength ratings**

Recommendation support dimension	No support	Some support	Full support
Research strength (number of high quality studies with favorable effects on child or teacher/classroom outcomes)	No high quality studies show improved child or teacher/classroom outcomes	One or two high quality studies show improved child or teacher/classroom outcomes	Three or more high quality studies show improved child or teacher/classroom outcomes
Practice strength (whether supported by professional best practices or expert recommendations)	Neither professional best practices nor expert recommendations support the indicator	At least one set of professional best practices or expert recommendations partially supports the indicator, or only one (and not both) set fully supports the indicator	Both professional best practices AND expert recommendations support the indicator

## References

- Clements, D. H., & Sarama, J. (2008). Experimental evaluation of the effects of a research-based preschool mathematics curriculum. *American Educational Research Journal*, *45*(2), 443–494.
- Domitrovich, C. E., Gest, S. D., Gill, S., Bierman, K. L., Welsh, J. A., & Jones, D. (2009). Fostering high-quality teaching with an enriched curriculum and professional development support: The Head Start REDI program. *American Educational Research Journal*, *46*(2), 567–597.
- Nix, R. L., Bierman, K. L., Heinrichs, B. S., Gest, S. D., Welsh, J. A., & Domitrovich, C. E. (2016). The randomized controlled trial of Head Start REDI: Sustained effects on developmental trajectories of social-emotional functioning. *Journal of Consulting & Clinical Psychology*, *84*(4), 310–322.
- Sasser, T. R., Bierman, K. L., Heinrichs, B., & Nix, R. L. (2017). Preschool intervention can promote sustained growth in the executive-function skills of children exhibiting early deficits. *Psychological Science*, *28*(12), 1719–1730.
- Welsh, J. A., Bierman, K. L., Nix, R. L., & Heinrichs, B. N. (2020). Sustained effects of a school readiness intervention: 5th grade outcomes of the Head Start REDI program. *Early Childhood Research Quarterly*, *53*, 151–160.
- Wilson, S. J., Dickinson, D. K., & Rowe, D. W. (2013). Impact of an Early Reading First program on the language and literacy achievement of children from diverse language backgrounds. *Early Childhood Research Quarterly*, *28*(3), 578–592.