SCHOOL READINESS CONSULTING

Mixed Delivery Evaluation Final Report

Evaluation of Virginia's Mixed Delivery Preschool Pilot Program

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EXECUTIVE SUMMARY

Positive experiences during the early years can dramatically change a child's life. Decades of robust research suggest high-quality early childhood programs can have substantial impacts on children's academic achievement in school and positive long-term outcomes later in life. As a result, momentum has continued to grow supporting the expansion of early education opportunities. However, despite increasing investment, demand has outpaced these efforts, resulting in too many families today without access to the benefits of affordable high-quality programs. Moreover, many providers of early childhood programming are also facing real challenges. Lack of funding results in community-based centers having to navigate and weave together multiple sources of funding to support quality programming. Even so, many centers are required to operate on thin margins, struggle to adequately compensate teachers, and must work with limited administrative capacity. In comparison, public schools often have more central office capacity leading to greater resources supporting teacher and programming needs. At the same time, many families find the school-day hours limited, or value the smaller and more specialized setting community-based centers can offer. For these reasons, many states have adopted "mixed delivery models," which offer publicly funded pre-K slots in both public schools and private child care centers. Mixed delivery allows families to consider publicly funded settings that provide year-round care and flexible hours that align with work schedules and are responsive to family needs and preferences about what type of environment they desire for their children.

Recently, Virginia has taken bold steps to explore the potential benefits of mixed delivery. In 2016, with support from the governor and the Virginia General Assembly, the Virginia Early Childhood Foundation (VECF) launched the Mixed Delivery Preschool Pilot Program. The Mixed Delivery Preschool Pilot Program was created in response to the recognition that local community innovation can shed light on building a more robust system of delivery that will benefit families with young children across the state. The pilot program was developed to be an innovative grant program that provides the opportunity for the state to explore locally driven lessons about how to maximize the use of public pre-K investments. To that end, the pilot program awarded grants to local communities throughout Virginia to test replicable innovative strategies to increase the number of publicly funded pre-K slots in private child care centers. As a key part of this initiative, a rigorous evaluation of Cohorts 1 (Mixed Delivery grantees in 2016-17) and 2 (Mixed Delivery grantees in 2017-18) was conducted to examine the implementation and outcomes of the program. The study examined four research questions:

RESEARCH QUESTIONS

1. What are the language, literacy, numeracy, and self-regulation outcomes of children who attended programs that participated in the Mixed Delivery Preschool Pilot Program and how do those outcomes compare to outcomes achieved by students in public school VPI classrooms?

2. What is the relationship between teacher qualifications and child developmental outcomes among preschool children in mixed delivery and public school classrooms?

3. What are the program quality and teaching practice outcomes for programs participating in the Mixed Delivery Preschool Pilot Program?

4. What were the experiences of grantees that implemented the Mixed Delivery Preschool Pilot Program?

The results of the study show a significant amount of promise for the Mixed Delivery Preschool Pilot Program and for the broader implementation of a mixed delivery public preschool model in Virginia, as demonstrated by both impact outcomes and also implementation findings. Overall, the state investment in communities' exploration of this important option helped to highlight:

- The positive impact that mixed delivery programs can have on children's developmental outcomes
- The effectiveness of classroom teachers across a range of settings and qualifications, leading to important benefits for children's school readiness outcomes
- Important quality improvement and systems-building efforts taken on by mixed delivery communities in their work to increase quality and meet the range of needs and desires of families in their efforts to access high-quality public preschool options

Key Findings

1. Children in mixed delivery classrooms showed substantial growth in literacy skills during their preschool year and had Phonological Awareness Literacy Screening (PALS)-PreK scores that met or surpassed developmental milestones at the end of preschool.
2. The majority of children in both mixed delivery and public school Virginia Preschool Initiative (VPI) classrooms had language, literacy, and math scores that met or exceeded typical scores for their age group in the spring of their preschool year.
3. Matched children in mixed delivery and public school VPI classrooms had similar spring scores, on average, in math, literacy, language, and self-regulation.
4. Teacher qualifications varied across mixed delivery classrooms and public school VPI classrooms, yet children achieved similar outcomes across the different settings.
5. Lead teacher qualifications were not significantly related to children's literacy, language, or self-regulation outcomes, though having a bachelor's degree and having a CDA were positively associated with children's math outcomes.
6. In a one-year period, **many mixed** delivery programs progressed to higher Virginia Quality ratings.
7. Teachers in public school VPI programs and in private settings may have different strengths and supports for instruction and interaction, including children's social-emotional development and child assessment.
8. Mixed delivery communities all advanced in formalizing shared governance, establishing partnerships, increasing access and using data, building workforce capacity, and leveraging funding.

The pilot project provides evidence that mixed delivery approaches hold great promise for Virginia. The outcome evaluation shows that the majority of pupils in both VPI and mixed delivery classrooms achieved outcomes that met or exceeded outcomes typical for their age group and that pupils in mixed delivery classrooms achieved outcomes comparable to those of pupils in VPI classrooms. Teacher credentials varied across both settings, yet, except for math scores, there was no association between credentials and child outcomes. The implementation evaluation demonstrates that mixed delivery communities produced many essential systems-level changes, including improved quality in mixed delivery classrooms after one year of participation, and observable improvements in public-private collaboration needed to support the expansion of mixed delivery. These positive outcomes strongly suggest that expanding mixed delivery can be a viable and desirable public policy option for the Commonwealth.

INTRODUCTION

Early learning matters. The evidence is clear that learning and experiences during the first few years of life can have a significant impact on young children's healthy development and provide the foundation for all future learning. Moreover, decades of research and practice have pointed to the specific role of high-quality early childhood programs in driving children's educational and lifelong outcomes. Children's access to high-quality early education opportunities is consistently being linked to greater achievement in school, better health outcomes, reduced involvement with the criminal justice system, and increased earnings as adults—among other long-term benefits (Center on the Developing Child, n.d.; Schweinhart et al., 2005; Yoshikawa et al., 2013). Further, access to a range of early education programs is an important component of a healthy, viable community. Studies show access to early childhood programming provides important work support, helping put families on firmer financial ground. A robust local system of quality programs can have social, economic, and environmental benefits not only for children, but for their families and the community at large (Ready Nation, n.d.). As a result, substantial momentum has been building in states across the country to increase the availability and quality of early childhood programming—particularly with pre-K programs serving three- and four-year-olds—to foster positive outcomes for young children, families, and communities as a whole (Friedman-Krauss et al., 2019).

Despite this progress, the reality is that not all children have been afforded the same opportunities to learn and thrive in the early years. Data shows that nationally less than one half of four-year-olds attended public preschool during the 2017–2018 school year, and that access and participation only decreases for younger children (Friedman-Krauss et al., 2019). Many families rely on public funding to access high-quality preschool, enrolling their children in public programs like Head Start and school-based pre-K. However, these programs are not always able to accommodate all eligible children due to constraints such as a lack of classroom space, teacher shortages, funding and programming needs (Schmit, Matthews, Smith, & Robbins, 2013; Wat & Gayl, 2009; Wilinski, 2017). Innovations in pre-K service delivery have become significantly more common and critical in recent years as states and localities alike work to overcome such barriers and leverage limited resources. Of the promising approaches, several states have adopted mixed delivery systems, in which publicly funded early childhood slots are offered in diverse settings that meet program standards, including public schools and private programs (Friedman-Krauss et al., 2018). Thus, mixed delivery allows families to consider publicly funded settings that provide year-round care and flexible hours that align with standard as well as nonstandard or fluctuating work schedules (Del Grosso, Akers, Mraz Esposito, & Paulsell, 2014; Wat & Gayl, 2009; Wilinski, 2017), and that are responsive to families' preferences around what type of environment they desire for their children.

Research on mixed delivery systems suggests a positive association with child outcomes, across multiple domains of language, literacy, and math, with gains that persist through the early grades; research also suggests mixed delivery systems are linked to reductions in grade repetition, lower special education participation, and other important benefits (Farrie, 2014; Peisner-Feinberg, Schaaf, & LaForett, 2013). Further, studies show early childhood programs engaged in mixed delivery partnerships have experienced increases in classroom and program quality, which have been associated with positive cognitive, language, and social-emotional outcomes for children (e.g., Mashburn et al., 2008; NICHD Early Child Care Research Network, 2002; Sabol, Soliday Hong, Pianta, & Burchinal, 2013; Sabol & Pianta, 2014). As states and localities continue to invest in mixed delivery approaches, it is important for researchers to continue to examine the utility and effectiveness of this service delivery model from both a programmatic and a policy perspective, as well as to further explore the implications for programs, educators, and children.

What is Mixed Delivery?

In the preschool context, mixed delivery refers to the provision of publicly funded preschool slots (such as state pre-K or Head Start) in private sector programs. In Virginia, the Mixed Delivery Preschool Pilot Program is a grant initiative that funds communities to field test innovative strategies that support a public-private system of preschool delivery.

THE OPPORTUNITY

MIXED DELIVERY PRESCHOOL IN VIRGINIA

EXISTING CHALLENGES

Virginia, like many states, is home to a diverse delivery system for early care and education. Currently, early education programs available to young children (ages birth through four years old) include:

- **Virginia Preschool Initiative (VPI)**, the state-funded public preschool program for at risk four-year-olds
- **VPI+**, funded through the Federal Preschool Expansion grant, providing increased access and quality improvement supports in VPI classrooms in high-need communities
- Federally funded, locally administered **Head Start and Early Head Start** programs serving children birth through five
- **Title 1 preschool** to provide preschool programming in school divisions to income-eligible communities
- **Part C Early Intervention** programs serving infants and toddlers and Part B Special Education serving children preschool and older
- **Formal and informal center- and home-based child care programs** supported through parent fees and child care subsidies available to some families
- **Home visiting** to provide direct support and services to families in a home setting

Rough estimates exist for the participation of young children in early education programming in Virginia. While barriers in getting accurate and unduplicated data exist, it is generally estimated that 60 to 70 percent of children birth to five are in some kind of care or preschool arrangement in Virginia (Glazer, 2016, p. 23).[1]

Of these service delivery options, the state has made a significant commitment, through VPI, to provide services to children during the year prior to kindergarten entry. VPI was established to reduce disparities among four-year-old children upon formal school entry and to reduce or eliminate risk factors that can lead to early academic failure (Virginia Department of Education, 2019). However, a number of challenges related to program funding and meeting needs of families has resulted in limits to both access and availability—especially for children most in need.

With regard to enrolling children in the state-funded preschool program, the state has experienced challenges in maximizing enrollment through the current funding and program options available to families. Some communities have been unable to meet the demand for public preschool, in part because of financing issues (both inadequate state-assumed per-pupil rate and limited funding for the required local match) and in part because of a lack of space and capacity to offer sufficient preschool slots in public schools. Although communities could address the space issue by providing additional public preschool slots in private sector programs, relatively few communities have used this strategy in past years (Joint Legislative Audit and Review Commission, 2017; Virginia Early Childhood Foundation, n.d.).

[1] Estimate is based on the percentage of children in households with employed family members.

Existing public preschool programs in schools have also been unable to meet the needs of some eligible families who work full time, because preschool is typically offered for a few hours each day and only for the school year. Eligible families who were unable to access public preschool, either because of insufficient slots or because the program schedule did not meet their needs, could not always afford to send their children to high-quality private preschool programs. As a result, some eligible children in Virginia, including those who could potentially benefit the most, were missing out on the opportunity to attend high-quality preschool (Virginia Early Childhood Foundation, n.d.).

These challenges are not unique to Virginia. With multiple funding streams and a disparate group of "sectors" loosely connecting various programmatic options, the terrain has historically been complex for families and providers alike. Funding for early care and education has been a patchwork of federal, state, and local investment, and none of these sources—in most cases—is sufficient to support the full costs of quality care, often necessitating providers to navigate multiple systems to blend or braid available funds. Despite investments and efforts by providers to adequately finance their programs, care for children birth through five has always been heavily reliant on parent fees, which in more than 33 states rival college tuition, putting access to quality care out of reach for many families and children (Oncken, 2016). Research has found that parents pick up 60 percent of the cost of care for their young children; federal, state and local governments shoulder 39 percent; and businesses and philanthropy contribute just 1 percent (Mitchell, Stoney, & Dichter, 2001).

In addition, investments have been imbalanced across sectors and settings, with some programmatic options receiving additional public funding, while others do not. As a result, as one sector (such as public pre-K) grew through public investment, other sectors (family- and center-based child care) struggled to maintain the enrollment needed to meet narrow profit margins and program quality expectations. Child care programs have attempted to serve more infants and toddlers as a result of the growth of public pre-K, but younger children require lower adult-child ratios and therefore a different, and more costly funding model. This challenge has been a particularly significant factor in the Virginia early childhood education landscape. As a result, this challenge has had a negative impact on child care programs in the private sector, which represent an important small business segment as well as a necessity for many working families in Virginia.

INNOVATIVE ACTION

Within this context, Virginia's current system of public pre-K is not yet being maximized—a critically important approach to achieve equity in education for the state's youngest learners. The Mixed Delivery Preschool Pilot Program was created in response to the recognition that the current delivery system has limitations and that local community innovation can shed light on building a more robust system of delivery that will benefit families with young children across the state. The pilot program was developed to be an innovative grant program that provides the opportunity for the state to explore locally driven lessons about how to maximize the use of public pre-K investments.

As states and communities across the United States are working to expand access to early learning and related services, the most successful efforts to date have worked to align the various systems that impact children and families and take a holistic approach to meeting their needs. Such efforts enable streamlined access to programs and services, enhanced accountability, and systematized equitable early learning practices in the preschool years and across the prenatal-through-age-five continuum.

In addition to providing positive outcomes for children and families, programs and communities also benefit from partnerships. A number of studies of mixed delivery systems have addressed program-level outcomes. In a study focused on community-based private programs, directors of child care programs reported funds and supports they received through

early care and education partnerships were key in enabling them to follow more rigorous program standards and helped them provide higher-quality services (Kiron, 2003). In addition, private programs in mixed delivery systems often gain access to professional supports, such as increased educational opportunities, specialized training, and technical assistance opportunities (Schilder et al., 2005; Schilder, Kiron, & Elliott, 2003; Wat & Gayl, 2009). Staff of private programs in early education partnership initiatives reported that joint professional development opportunities for teachers in public schools and private child care programs allowed them to share best practices in early learning and expand their networks (Holcomb, 2006).

Mixed delivery systems have the flexibility and capacity to contribute to the creation of a more aligned, holistic, and equitable system of care in Virginia.

By expanding access to public preschool among eligible families, offering public preschool in settings with flexible hours of service, and supporting critical small and local businesses by maintaining or increasing enrollment of four-year-olds in private programs, the Mixed Delivery Preschool Pilot Program is well positioned to address state priorities and ensure more children have access to early learning experiences needed to put them on the road to later school success.

OVERVIEW OF THE MIXED DELIVERY PRESCHOOL PILOT PROGRAM

To explore the potential benefits of mixed delivery, the Virginia Early Childhood Foundation (VECF) launched the Mixed Delivery Preschool Pilot Program in 2016 with support from the governor and the Virginia General Assembly. VECF awarded mixed delivery pilot grants of two-year terms to five grantees in July 2016 (Cohort 1 grantees), and an additional five grantees in July 2017 (Cohort 2 grantees) (Figure 1). Each grantee agency partnered with one or more local mixed delivery programs or private sector programs that provided public preschool slots (VPI) and participated in activities and supports offered through the mixed delivery grant. Some grantee agencies also partnered with other community agencies to provide quality improvement supports and manage grant activities. Mixed delivery grantees had flexibility to pilot unique and innovative strategies to support public-private partnerships and increase collaboration among child care, school districts, and community programs.

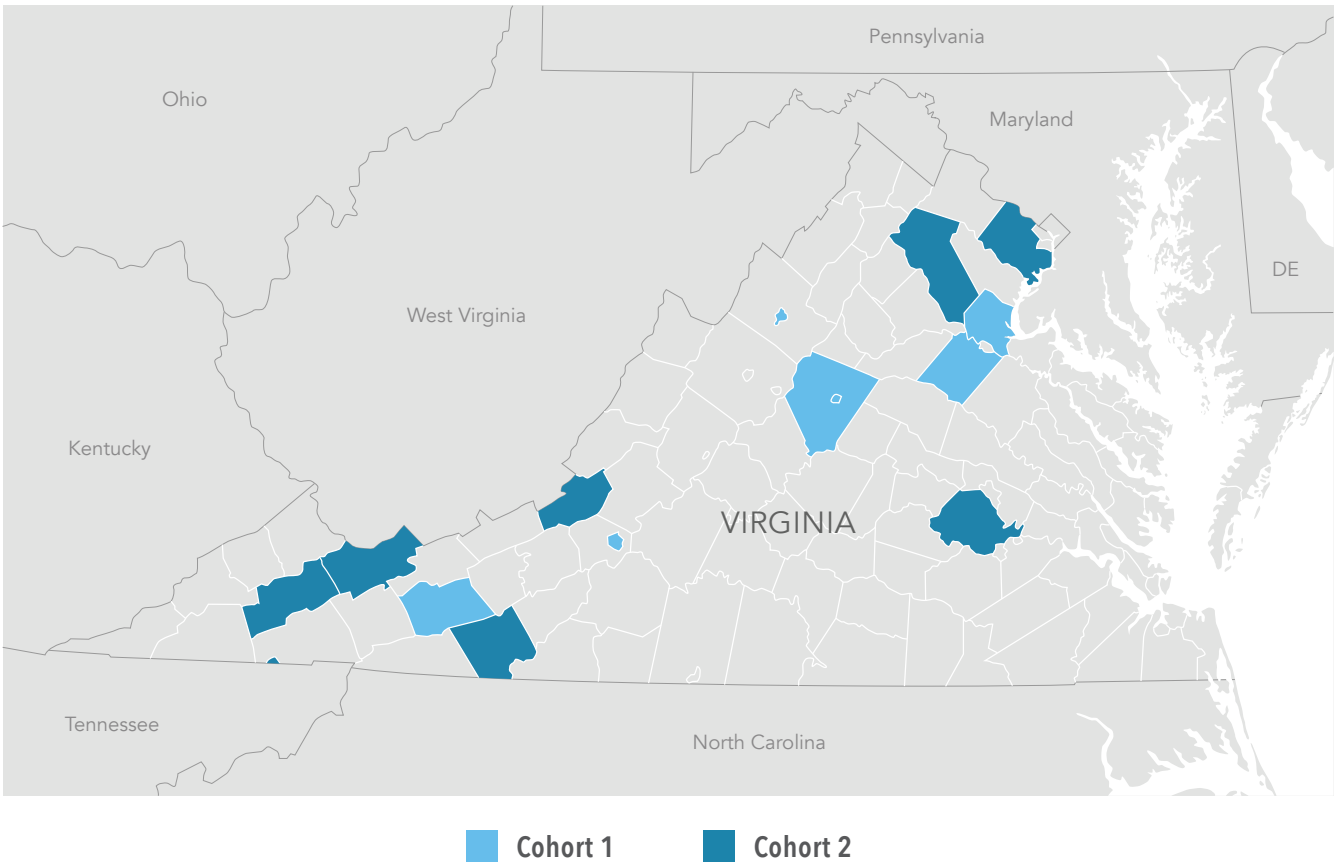
The Mixed Delivery Preschool Pilot Program awarded grants to local communities throughout Virginia (approximately $250,000 per community) to field test replicable innovative strategies that support a public-private system of preschool delivery with a focus on expanding the numbers or proportion of at-risk children served in private settings and opportunities for private providers to participate. Funding for this pilot was included in Governor McAuliffe's FY17–18 biennial budget and approved by the 2016 General Assembly. In addition, the General Assembly passed leg-

islation creating the Mixed Delivery Preschool Fund and Grant Program, which outlined details of the pilot program (House Bill 47, Patron: Greason), including priorities for pilots in urban, suburban, and rural communities.

The Mixed Delivery Preschool Pilot Program (Cohorts 1 and 2) served 15 jurisdictions in Virginia.[2] Cohort 1 included five grantees in different parts of the state, and nine private programs offering mixed delivery services to children. Cohort 2 included an additional five grantees in other locations in Virginia, along with 16 private programs and seven family child care providers who proposed innovative strategies that support a public-private system of preschool delivery. Priority was given to communities that did not fully utilize their VPI allocation and those that could document unmet need for services for at-risk preschoolers and who proposed innovative ideas for overcoming barriers.

Mixed delivery programs offered flexible schedules to participating families. Almost all of the mixed delivery programs (90%)[3] operated full-year programs. This may be an important feature for working families seeking pre-K, as they require services throughout the year. Both mixed delivery programs in Cohort 1 and in Cohort 2 offered "full-day" (typically 5.5 to 6 hours) preschool. Further, more than half of mixed delivery programs (60%)[4] offered an "extended day" option.[5] This option, which is not available in public school VPI programs, may be viewed as a benefit for families seeking additional hours of care due to typical 9–5 work schedules.

FIGURE 1: Jurisdictions with Mixed Delivery Preschool Pilot Programs



[2] In this section, we present data on the characteristics of mixed delivery programs and classrooms, which we collected from each participating mixed delivery program. We collected this data in both years of the grant but present data from the second year of grant implementation (2017–18 for Cohort 1 and 2018–19 for Cohort 2) when the initiative was established in each site. The purpose of presenting these data is to provide a snapshot of the programs involved in the initiative as well as to provide context for the qualitative findings that will follow.

Mixed delivery programs varied in the number and ages of children that they served. The private programs and family child care providers offering mixed delivery served as few as one child to as many as 144 children. Seventy-seven percent[6] of programs that hosted mixed delivery classrooms or children served preschool-aged children, as well as toddlers and infants. Providing care for children from birth to five is especially beneficial for families looking for care for multiple children. Additionally, this service range likely supports the sustainability of programs, by diversifying the program's funding streams (i.e., private pay and VPI funds) and by offering a service that families can utilize over an extended period of time.

Teachers of mixed delivery classrooms possessed a range of qualifications. More than half of mixed delivery classrooms (54%)[7] were staffed by lead teachers with a bachelor's degree or higher. A fourth of these teachers reported having a teaching license.[8] Further, 32 percent[9] of lead teachers had a child development associate (CDA) credential, and 79 percent[10] had completed coursework in child development or early childhood education. Relatedly, 18 percent[11] of supporting staff (e.g., assistant teacher) also had at least a bachelor's degree. Twenty-five percent[12] of assistant teachers possessed a CDA, and 39 percent[13] had completed coursework in child development or early childhood education.

Mixed delivery programs approached funding for preschool slots in a number of ways. Child care subsidy was the most common funding source for preschool slots (75%).[14] Mixed delivery programs also funded their slots through VPI and Head Start funds (23%[15] and 13%[16] respectively). Across the programs, about one-third (34%)[17] of funding for slots came from other sources such as scholarships, special education funding, and private pay. Further, a little more than one-third (37%)[18] of programs blended, braided, or stacked funds from a variety of sources. To meet the needs of young children and families, early childhood programs are often required to maximize public and private sector investments by combining funds from two or more funding streams. Similarly, the funding models of mixed delivery programs were complex and often required a number of funding sources in order to address the cost of care.

[3] Cohort 1: 78%; Cohort 2: 95%.

[4] Cohort 1: 44%; Cohort 2: 67%.

[5] Many programs braided funding with child care subsidy funding to create the wraparound day/year for eligible families.

[6] Cohort 1: 76%; Cohort 2: 77%.

[7] Cohort 1: 50%; Cohort 2: 57%.

[8] Out of all lead teachers, no matter their level of education, 14% possess a teaching license; Cohort 1: 21%; Cohort 2: 7%.

[9] Cohort 1: 36%; Cohort 2: 29%

[10] Cohort 1: 79%; Cohort 2: 69%.

[11] Cohort 1: 20%; Cohort 2: 17%.

[12] Cohort 1: 14%; Cohort 2: 36%.

[13] Cohort 1: 43%; Cohort 2: 36%.

[14] Cohort 1: 55%; Cohort 2: 84%.

[15] Cohort 1: 78%; Cohort 2: 0%.

[16] Cohort 1: 33%; Cohort 2: 5%.

[17] Cohort 1: 67%; Cohort 2: 20%.

[18] Cohort 1: 78%; Cohort 2: 18%.

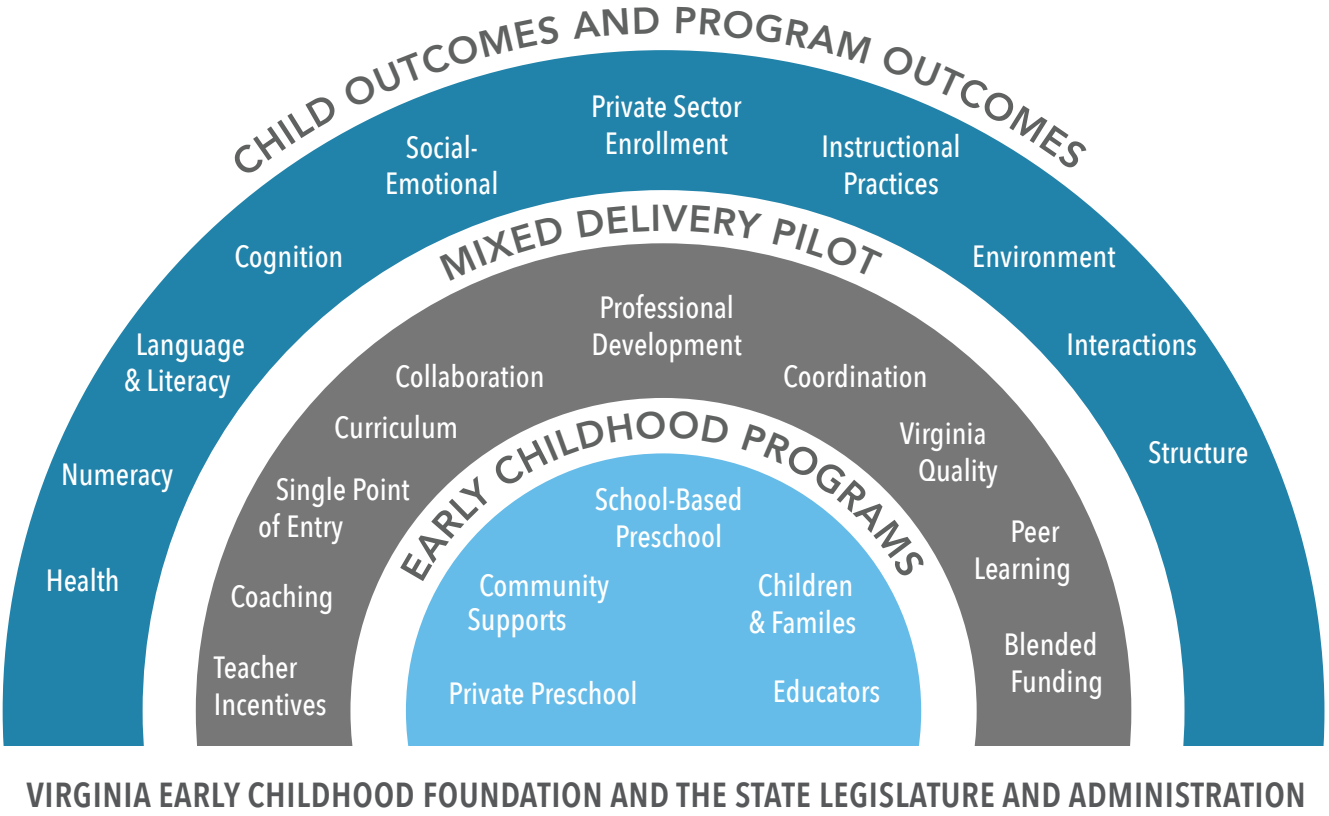
EVALUATION

OF THE MIXED DELIVERY PRESCHOOL PILOT PROGRAM

In October 2016, the Virginia Early Childhood Foundation (VECF) contracted with School Readiness Consulting (SRC) to conduct an evaluation of the Mixed Delivery Preschool Pilot Program (Cohorts 1 and 2, 2016–2019). SRC's mission is to integrate strategic thinking, best practice, and evaluation to transform early learning and affirm the right of all children to thrive. In partnership with VECF and the mixed delivery grantees, SRC conducted a rigorous evaluation of the mixed delivery program that included an outcomes study and an implementation study.

The research plan for the evaluation was informed by a theory of change for the mixed delivery initiative, shown in Figure 2. In this theory of change, early childhood programs are the core of the mixed delivery system, encompassing private and school-based preschool programs, the educators who work in these programs, the children and families who participate in the programs, and the communities that support these programs. The mixed delivery pilot initiative served to add a new layer of resources and opportunities for these early childhood programs, such as teacher incentives, coaching, systems with a single point of entry, curricula, collaboration and coordination opportunities, professional development, supports through Virginia Quality, peer learning opportunities, and blended funding. These new resources and opportunities were expected to help programs achieve their desired child outcomes (such as literacy, language, numeracy, and social-emotional skills), enrollment increases, and program and system outcomes (such as improved instructional practices, classroom environment, adult-child interactions, and program structure). State-level supports, including those from the state legislature and administration and VECF, provided a foundation for the new initiative.

FIGURE 2: Theory of Change for the Mixed Delivery Preschool Pilot Program



The research plan for the evaluation aligned with this theory of change by examining implementation of the new resources and opportunities that are part of the mixed delivery pilot, and the program and child outcomes that occur as grantees implement their pilot grants. This study used a mixed methods approach to examine the implementation and outcomes of the Mixed Delivery Preschool Pilot Program. The study examined four research questions:

RESEARCH QUESTIONS

1. What are the language, literacy, numeracy, and self-regulation outcomes of children who attended programs that participated in the Mixed Delivery Preschool Pilot Program and how do these outcomes compare to those achieved by students in public school VPI classrooms?
2. What is the relationship between teacher qualifications and child developmental outcomes among preschool children in mixed delivery and public school classrooms?
3. What are the program quality and teaching practice outcomes for programs participating in the Mixed Delivery Preschool Pilot Program?
4. What were the experiences of grantees that implemented the Mixed Delivery Preschool Pilot Program?

The study team developed the study design and methods to be responsive to the goals and priorities of stakeholders, including VECF, grantees, and the state legislature and administration. The study was designed to rigorously address the priorities for the evaluation that were laid out in the request for proposals (RFP), respond to grantees' interest in hearing about successes and challenges among their peers, and minimize the burden of data collection on grantees and their local partners. In the evaluation, SRC used existing data being collected by state agencies when possible, as well as additional data collected by grantees and the SRC study team.

The methodology box on the following page provides a brief overview of the methods used to address each research question. Additional information about the study methodology is provided in Appendix A.

METHODOLOGY

Outcomes Study (Research Questions 1, 2, and 3): The outcomes study draws from several sources of quantitative data, including existing data and data collected for the study. The table that follows describes the sample, research question (RQ), and analysis method for each type of data.

Implementation Study (Research Question 4): The implementation study draws from both quantitative and qualitative data. The quantitative data include program characteristics and mixed delivery enrollment in the second year of the grant (when mixed delivery classrooms were well established) for all 10 grantees. The qualitative data include transcripts from focus groups with grantee staff, mixed delivery program staff, and parents of children enrolled in mixed delivery slots, conducted with the five Cohort 1 grantees in the first year of the grant. The qualitative data also include transcripts from telephone interviews with grantee staff that were conducted in the second year of the grant for the five Cohort 1 grantees and the first year of the grant for the five Cohort 2 grantees. In addition, qualitative data involve mid-year and end-of-year reports from all 10 grantees. The study team conducted descriptive analysis of the quantitative data and qualitative analysis of the focus group and telephone interview data and report data.

DATA TYPE	SAMPLE	RQ	ANALYSIS METHOD
DATA COLLECTED FOR THE EVALUATION			
Child Assessments Using Woodcock Johnson III Applied Problems (Math), Letter-Word Identification (Literacy), Picture Vocabulary (Language), and Head Toes Knees Shoulders (Self-Regulation)	229 children in mixed delivery and VPI classrooms, Cohort 1, data collected fall 2017 and spring 2018	1, 2	Propensity score matching to examine effects of mixed delivery on child outcomes (using a matched sample of 128 children)
Child Characteristics	229 children in mixed delivery and VPI classrooms, Cohort 1	1, 2	Descriptive analysis, also used for propensity score matching
Program and Classroom Characteristics	23 programs in mixed delivery and VPI classrooms, Cohort 1 46 classrooms in mixed delivery and VPI classrooms, Cohort 1	2	Descriptive analysis, teacher qualifications also used in regression analysis
Survey of Teaching Practices	49 teachers in mixed delivery and VPI classrooms, Cohort 1	3	Descriptive analysis
EXISTING DATA PROVIDED BY VIRGINIA STATE AGENCIES			
Phonological Awareness Literacy Screening (PALS) Pre-K Literacy Scores	All available data for Cohort 1 and 2 sites	1	Descriptive analysis
Virginia Quality Ratings	49 teachers in mixed delivery and VPI classrooms, Cohort 1	3	Descriptive analysis

KEY FINDINGS

CHILD DEVELOPMENTAL OUTCOMES

RESEARCH QUESTION 1:

What are the language, literacy, numeracy, and self-regulation outcomes of children who attended programs that participated in the Mixed Delivery Preschool Pilot Program and how do these outcomes compare to those achieved by students in public school VPI classrooms?

A robust body of research consistently supports the critical implications of children's developmental outcomes during the early years for their future learning and skill development. The evidence is clear that positive early learning experiences can have significant and lasting impacts on children's healthy development and academic achievement and can provide the foundation for lifelong success (Center on the Developing Child, n.d.; Schweinhart et al., 2005; Yoshikawa et al., 2013).

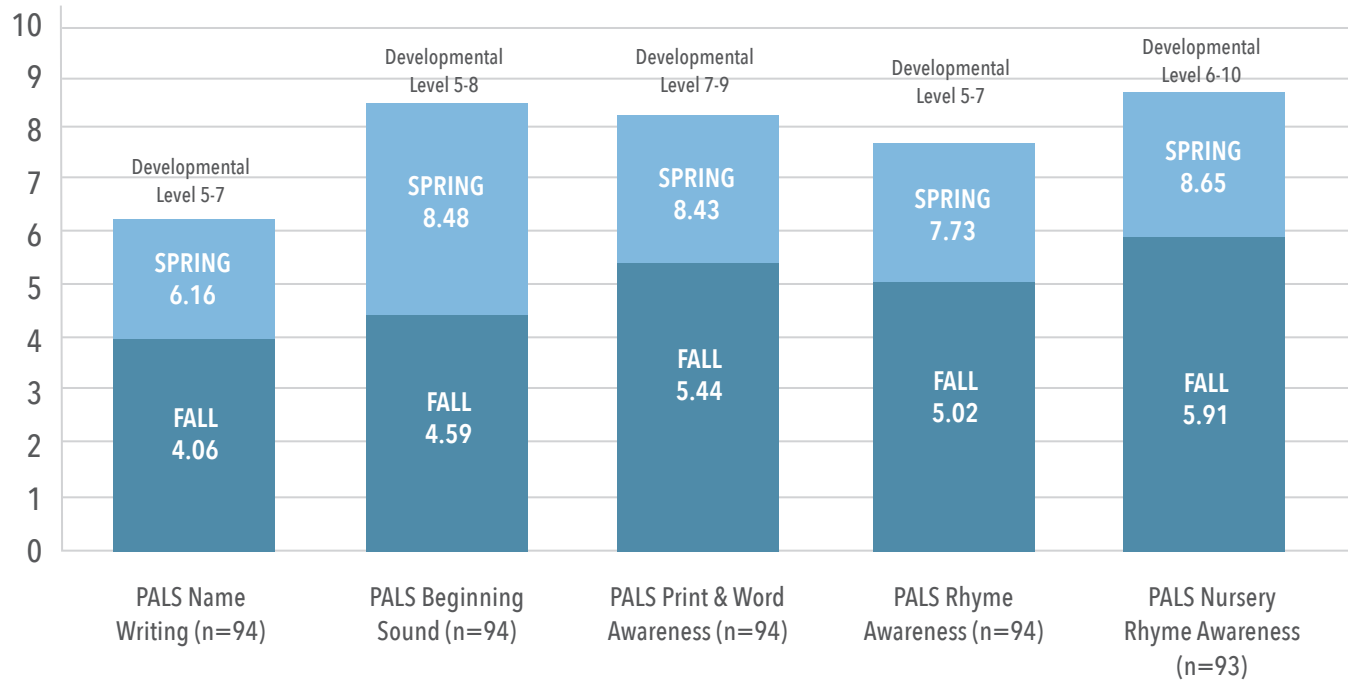
With our initial research question, we sought to explore the developmental outcomes and school readiness of children who attended programs participating in the Mixed Delivery Preschool Pilot Program. A key question for the ongoing investment in mixed delivery in Virginia includes an understanding of children's outcomes as a result of their participation in pre-K and as they enter kindergarten. Building upon this, the current study additionally seeks to understand the specific implications of setting type on child outcomes within the context of a mixed delivery approach. Therefore, another key factor to consider in the ongoing investment in mixed delivery in Virginia includes an understanding of children's academic and non-academic school readiness outcomes as a result of their participation in pre-K by setting type.

KEY FINDING 1

Children in mixed delivery classrooms showed substantial growth in literacy skills during their preschool year and had PALS-PreK scores that met or surpassed developmental milestones at the end of preschool.

Children in mixed delivery classrooms made substantial increases in average PALS-PreK scores from the fall to spring of the preschool year, as shown in Figure 3 (average uppercase alphabet scores also increased from 11.15 to 18.62, not shown in Figure 3). Furthermore, the average scores for each PALS-PreK subtest met or exceeded developmental levels, which are guidelines from the instrument developers on expected scores for four-year-olds in the spring of their preschool year.

FIGURE 3: PALS-PreK Fall 2017 and Spring 2018 Subtest Scores in Cohort 1 Mixed Delivery Classrooms, with Developmental Levels



WHY THIS FINDING MATTERS

It is well understood in the early learning field that children's capabilities in language and literacy at kindergarten entry correlate to success in elementary school and beyond. While there are a variety of in-school and out-of-school factors that can impact children's learning and achievement over time, research has shown with some consistency that preschool language and literacy skills predict levels of the same skills in elementary school (Pace et al., 2019). The research around school readiness and later school outcomes suggests that children's skills during preschool are even stronger predictors of success in later grades than the amount of instructional time that children have received, and that children showing the poorest outcomes at kindergarten entry tend to show the least amount of growth over time (Bodovski & Farkas, 2007). In other words, children who start school at an academic disadvantage progress at a slower rate than their more fully prepared peers, and the achievement gap widens over time.

For example, studies have found that children who are not proficient in reading by the end of third grade were four times more likely to drop out of high school. Conversely, 88 percent of students who did not earn a high school diploma were found to have reading challenges in third grade (Fiester & Smith, 2010). **This points to the urgency for early learning systems to ensure not only that children access pre-K settings, but that all settings that serve young children prioritize best practices around early learning and skill development.** Findings from this evaluation suggest that children in mixed delivery classrooms are meeting or surpassing important literacy milestones by the end of preschool. As preschool represents a critical time of unmatched developmental efficiency, this is a promising finding supporting the notion that mixed delivery programs are fostering strong child outcomes.

EVALUATION DETAILS

Our team analyzed PALS-PreK Literacy scores, using existing data collected by preschool teachers in mixed delivery classrooms. We summarized teacher-reported literacy scores for children in mixed delivery classrooms in Cohort 1 grantee communities, using data from the Phonological Awareness Literacy Screening (PALS) PreK instrument (Invernizzi, Sullivan, Meier, & Swank, 2004). To summarize the data, we present average fall and spring scores. We also provide information about how these average scores compare to PALS-PreK developmental levels, which are guidelines from the instrument developers on expected scores for four-year-olds in the spring of their preschool year. These analyses drew from existing state data collected by teachers on the children in their classrooms using the PALS-PreK instrument in 2017–18, the second year of mixed delivery grant implementation in Cohort 1 sites. We report only on Cohort 1 grantee communities because data were not yet available for the second year of grant implementation in Cohort 2 grantee communities. The sample included 94 children enrolled at mixed delivery sites.

We examined child outcomes in the second year of grant implementation, once grantees had fully implemented their initiatives. We conducted child assessments in the spring of the preschool year to measure child developmental outcomes of mixed delivery, and also conducted assessments in the fall of the preschool year as a baseline measure of child skills. Child outcomes were measured in the spring in order to have a consistent time point near the end of the program year, as not all programs operated in the summer. We chose to examine child outcomes in the spring of the preschool year, rather than the fall of kindergarten, because the kindergarten scores are measured several months after program participation and are more difficult to attribute to preschool experiences. Furthermore, we investigated the possibility of collecting PALS kindergarten data as well as PALS-PreK data for children in the study. However, as the existing Virginia Department of Education data system does not have the capacity to assign student identifiers, we were unable to follow children in the study from preschool to kindergarten in order to collect any kindergarten scores.

See Appendix A for additional information about the evaluation methodology.

MIXED DELIVERY & PUBLIC SCHOOL VPI CLASSROOMS

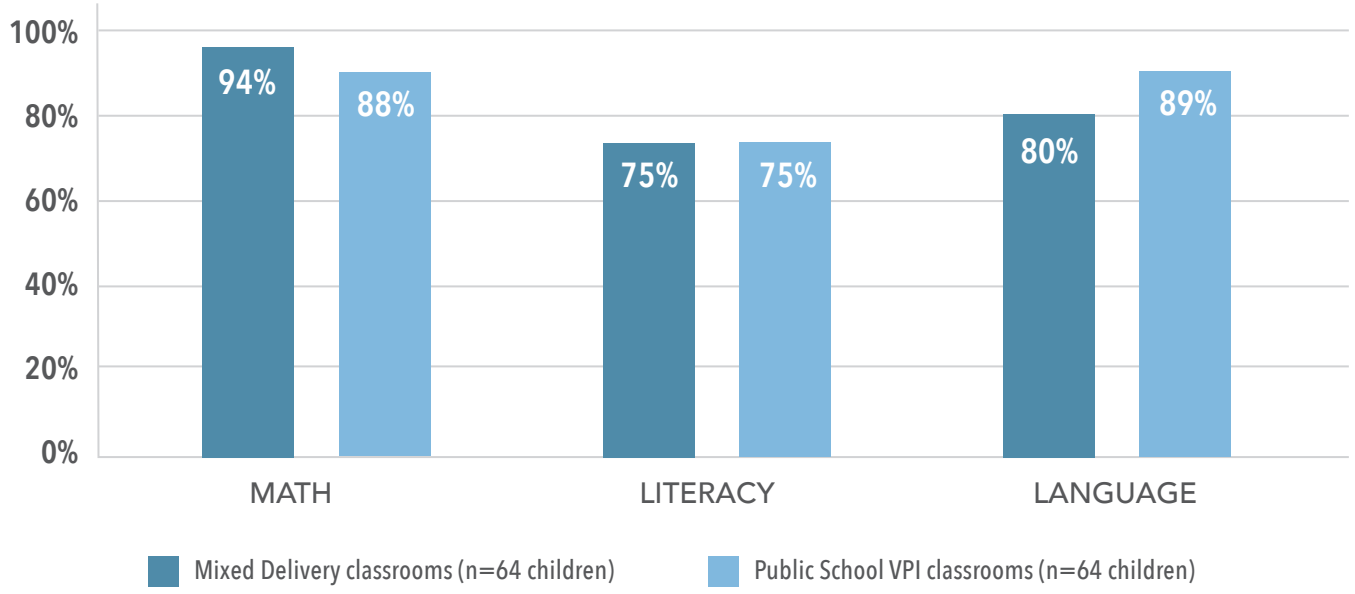
The evaluation compared child developmental outcomes for children who participated in mixed delivery classrooms with outcomes for children who participated in public school VPI classrooms in the same communities. At the end of preschool, several child developmental outcomes were examined, including language, literacy, math, and self-regulation. These analyses inform stakeholders about whether or not outcomes of mixed delivery are similar to outcomes of VPI, a state preschool program in Virginia, in public school settings.

KEY FINDING 2

The majority of children in both mixed delivery and public school VPI classrooms had language, literacy, and math scores that met or exceeded typical scores for their age group in the spring of their preschool year.

Among children in mixed delivery classrooms, 94 percent met or exceeded typical scores in math, 75 percent met or exceeded typical scores in literacy, and 80 percent met or exceeded typical scores in language (Figure 4). Among matched children in public school VPI classrooms, a similar percentage met or exceeded each of these scores. The typical scores are a performance standard based on norming data for the Woodcock Johnson instrument, and represent typical scores for all children (both children at risk and those not considered to be at risk). It is notable that a large percentage of children in both public VPI and mixed delivery classrooms (which serve only children considered to be at risk of not being ready for kindergarten) met or exceeded typical scores.

FIGURE 4: Percentage of Matched Children in Mixed Delivery and Public School VPI Classrooms Who Met or Exceeded Typical Scores for Their Age



Note: The percentage of children who met or exceeded typical scores for their age group was determined by Woodcock Johnson Relative Proficiency Index classifications.

WHY THIS FINDING MATTERS

Significant research confirms that economic hardship in a child's life—which often correlates to other problematic family and community conditions, such as food insecurity, low stimulation, and exposure to toxic stress—can have detrimental effects on children's development and lasting consequences for their long-term learning and chances of success. Children living in communities of concentrated poverty often have fewer opportunities than their more affluent peers to experience rich social interactions, high-quality birth-through-age-three child care, access to parks and playgrounds, and other resources that are vital to healthy development (Karoly, Kilburn, & Cannon, 2005). For that reason, children experienc-

ing these challenges early in life are often considered to be "at risk" or likely not to have developed the full range of skills and capabilities that they need to succeed in kindergarten and beyond.

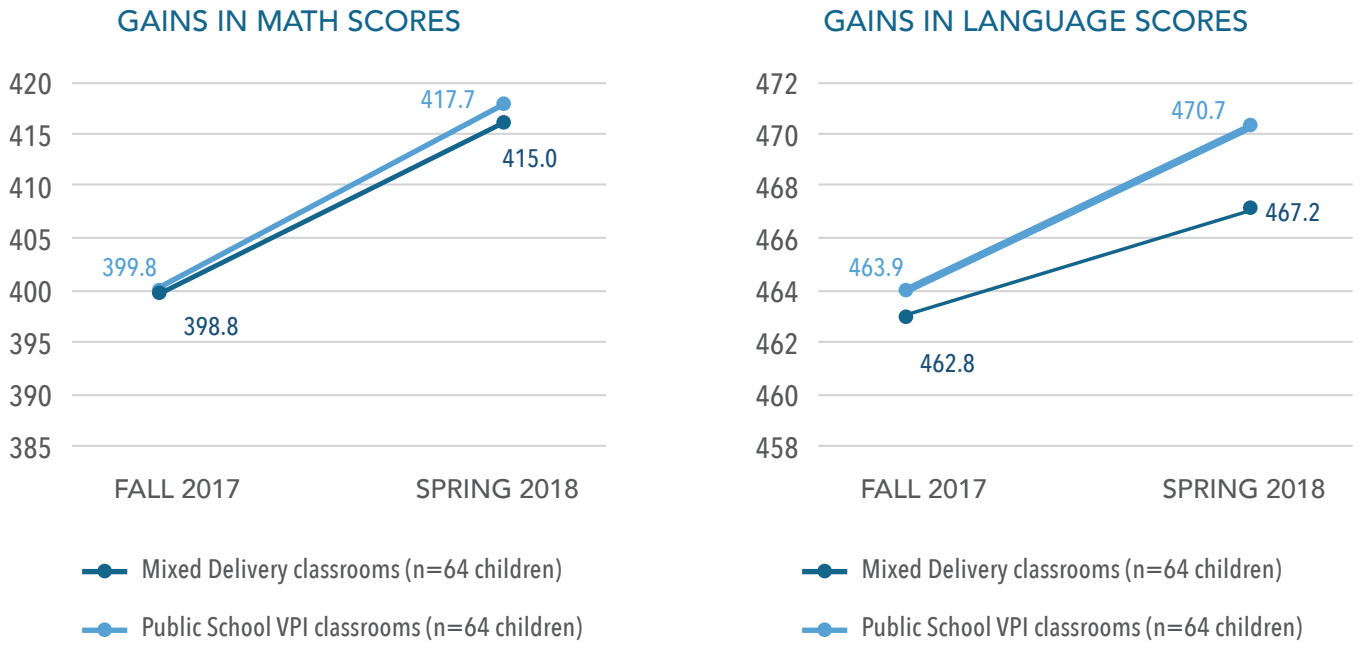
In Virginia, both public school VPI and mixed delivery classrooms serve children who are considered to be at risk for reasons of low socioeconomic status and related factors, and as a result are also considered to be at risk of not being ready for kindergarten. Therefore, it is notable that a large percentage of children met or exceeded typical scores in both public school VPI and mixed delivery classrooms. This further indicates what the research has consistently shown—that access to high-quality pre-K is a significant factor in narrowing critical achievement and outcome gaps between lower and higher income children (García & Weiss, 2017).

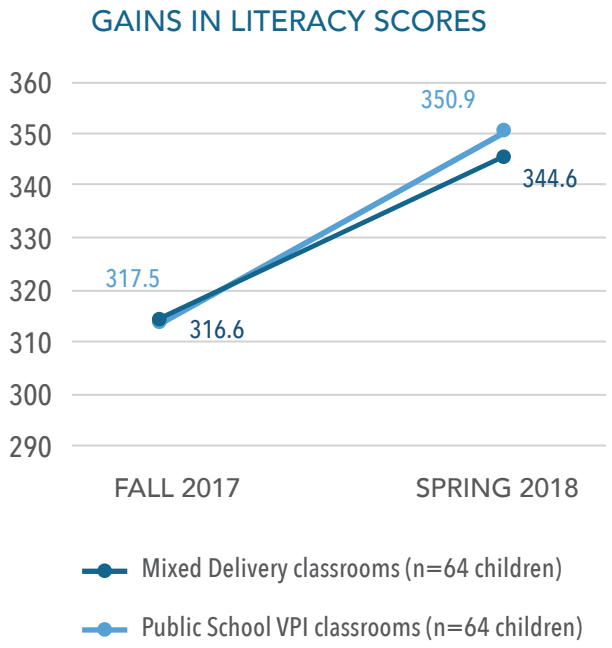
KEY FINDING 3

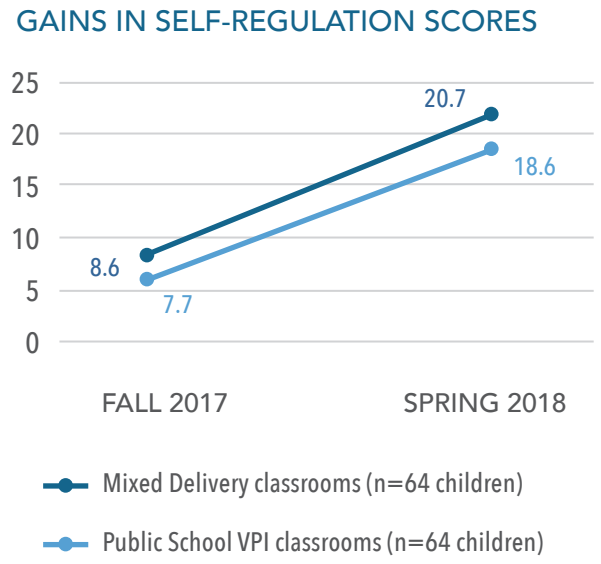
Matched children in mixed delivery and public school VPI classrooms had similar spring scores, on average, in math, literacy, language, and self-regulation.

Children in mixed delivery and public school VPI classrooms experienced similar gains over the program year in math, language, literacy, and self-regulation (Figure 5). The regression analyses found no statistically significant differences between children in mixed delivery and public school VPI classrooms in child developmental outcomes. These analyses did not control for fall pretest scores or child characteristics, since the children were matched based on both pretest scores and characteristics. This indicates similar levels of school readiness among children in both mixed delivery and public school VPI classrooms.

FIGURE 5: Gains in Child Assessment Scores Among Children in Mixed Delivery and Public School VPI Classrooms, Fall 2017 to Spring 2018



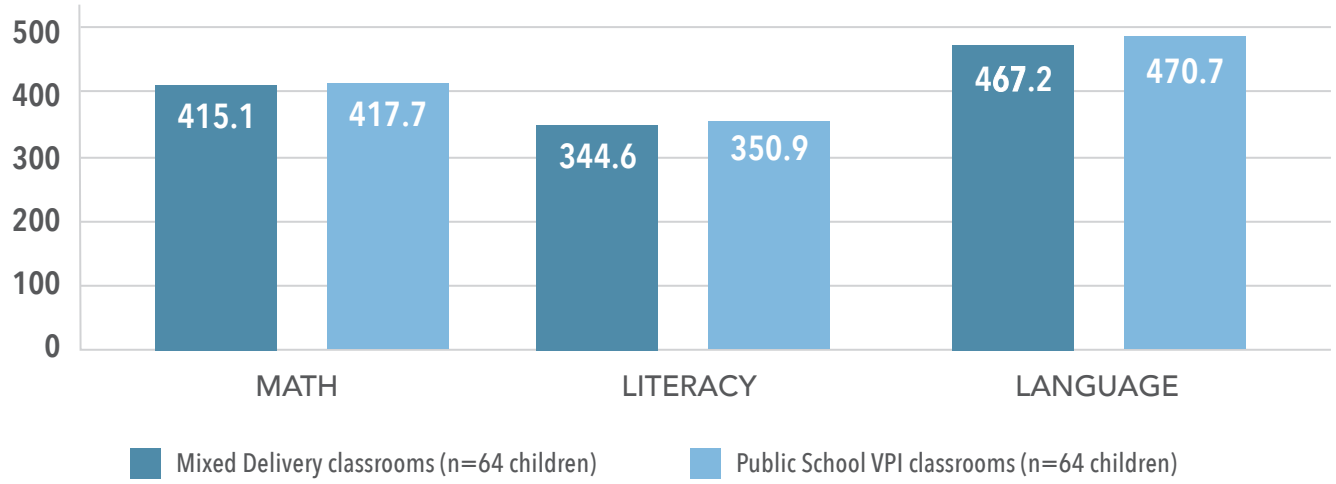




Note: The charts show mean fall and spring W scores on the Woodcock Johnson III Applied Problems (Math), Picture Vocabulary (Language), and Letter-Word Identification (Literacy) tests, as well as mean fall and spring raw scores on the Head Toes Knees Shoulders (Self-Regulation) task. The means are for the propensity-score matched sample of children in mixed delivery and public school VPI classrooms. Ordinary least squares regression analyses with the matched samples adjusted the standard errors to account for clustering of children in classrooms and found that in comparison with public school VPI, mixed delivery participation was not significantly associated with math, language, literacy, or self-regulation outcomes.

The scores of children in the matched sample for the study are quite similar to scores reported by the Woodcock Johnson instrument developers for the national norming sample in math (norming sample mean for age 4=399.2 and age 5=415.6), literacy (norming sample mean for age 4=331.6 and age 5=357.9), and language (norming sample mean for age 4=460.3 and age 5=468.2) (Figure 6). This suggests that children in both mixed delivery and public school VPI classrooms (all classified as at risk) complete their preschool year with a similar level of academic school readiness to children nationally (both children at risk and those not considered to be at risk).

FIGURE 6: Average Math, Literacy, and Language Scores in Mixed Delivery and Public School VPI Classrooms, Spring 2018



The Head Toes Knees Shoulders instrument developers have not normed sample data for self-regulation scores, but the scores among children in mixed delivery and public school VPI classrooms are comparable to those in other published studies that include scores for children at the end of preschool or the beginning of kindergarten (Schmitt, Pratt, & McClelland, 2014).

WHY THIS FINDING MATTERS

There has been some research to suggest that children who attend pre-K in public school settings generally experience more significant language, literacy, and cognitive gains than those who attend subsidized community-based care (Conger, Gibbs, Uchikoshi, & Winsler, 2019). However, in the context of the mixed delivery pilot, there were similar gains seen both over time and in average math, literacy, language, and self-regulation scores between public school VPI and mixed delivery classrooms.

This may provide important evidence that suggests children participating in both public school classrooms and community-based programs are receiving similar benefits from participation in pre-K programming across settings, and moreover were prepared at similar levels as they transitioned into kindergarten.

As previously discussed, it is also notable that these findings show that children in both mixed delivery and public school VPI classrooms complete their preschool year with a similar level of academic school readiness to children nationally—particularly as all children in this study were considered to be at risk, while the national sample of children includes both children who are and children who are not considered to be at risk. Overall, this finding may point to the potential efficacy of Virginia preschool overall and could suggest that with the availability of blended funding and other mixed delivery supports, community-based programs may be able to achieve child outcomes similar to those achieved by school-based programs.

EVALUATION DETAILS

We conducted child assessments in the fall and spring of the 2017–18 preschool year using the Head Toes Knees Shoulders instrument (Ponitz, McClelland, Jewkes, Connor, Farris, & Morrison, 2008) to measure self-regulation, and the Woodcock Johnson III instrument (Woodcock, McGrew, & Mather, 2001; Muñoz-Sandoval, Woodcock, McGrew, & Mather, 2005) to measure math (Applied Problems subtest), literacy (Letter-Word Identification subtest), and language (Picture Vocabulary subtest). The analysis also used data provided by family members on demographics and parenting practices.

In order to compare outcomes among children with similar demographics, parenting practices, and pretest scores, we used a statistical procedure called propensity score matching. Propensity score matching ensures that when we compare child outcomes for mixed delivery and public school VPI classrooms, we make "apple-to-apple" comparisons of children who were similar in multiple ways at the start of the preschool year. The analysis sample after propensity score matching included 128 children, with 64 children in Cohort 1 mixed delivery sites and 64 children in public school VPI classrooms in the Cohort 1 grantee communities.

For the analyses, we compared the spring developmental outcomes for matched children in mixed delivery and public school VPI classrooms. We used multiple regression analysis with the propensity score matched sample to examine relationships between mixed delivery participation and child outcomes. We present charts showing the average gains in the regression-adjusted math, literacy, language, and self-regulation scores among the matched children in mixed delivery and public school VPI classrooms. The results of these analyses describe children's readiness for kindergarten in mixed delivery and public school VPI classrooms and indicate how child outcomes in mixed delivery classrooms compare with those in public school VPI preschool classrooms.

Public school VPI is another early childhood initiative in the state that serves as a point of comparison, but it does not represent a performance standard. To compare child outcomes to a performance standard, we describe the percentage of children in the study who met or exceeded scores typical for their age in math, literacy, and language. We examined the percentage of children in mixed delivery and public school VPI classrooms who met or exceeded typical scores for their age group using the Woodcock Johnson III Relative Proficiency Index, which provides information about each child's level of proficiency in comparison with children of similar ages nationally. We grouped the eight Relative Proficiency Index levels into an indicator of whether or not children met or exceeded typical scores for their age group: children who did not meet or exceed the normal score range had Relative Proficiency Index classifications of "Severely Impaired," "Moderately Impaired," "Mildly Impaired," and "Mildly Impaired to Within Normal Limits"; children who met or exceeded the normal score range had Relative Proficiency Index classifications of "Within Normal Limits," "Within Normal Limits to Advanced," "Advanced," and "Very Advanced."

See Appendix A for additional information about the evaluation methodology.

KEY FINDINGS

TEACHER QUALIFICATIONS

RESEARCH QUESTION 2:

What is the relationship between teacher qualifications and child developmental outcomes among preschool children in mixed delivery and public school classrooms?

One of the most important factors in the success of early learning to support school readiness and drive strong outcomes is the early childhood teacher. The knowledge, skill, and experience that teachers bring to the classroom are integral to the quality and results of early learning initiatives and—the research suggests—may be more important than any other factor (Institute of Medicine and National Research Council, 2015). However, there remains ongoing debate among leaders in the field around whether a bachelor's degree should be required for early childhood teachers, or whether alternative pathways to credentialing might be as or more appropriate for the early learning sector.

For the second research question, the evaluation examined the relationship between teacher education and qualifications and children's developmental outcomes, which can serve as a proxy for school readiness, across both public VPI programs and private settings. Of specific interest was teachers' possession of a bachelor's degree, a requirement for teachers in public school VPI contexts that was waived by Virginia during the pilot for private programs participating in the mixed delivery pilot.

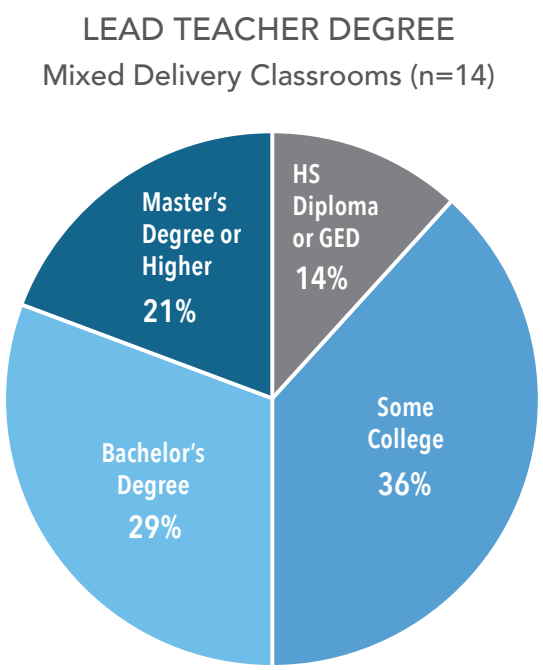
KEY FINDING 4

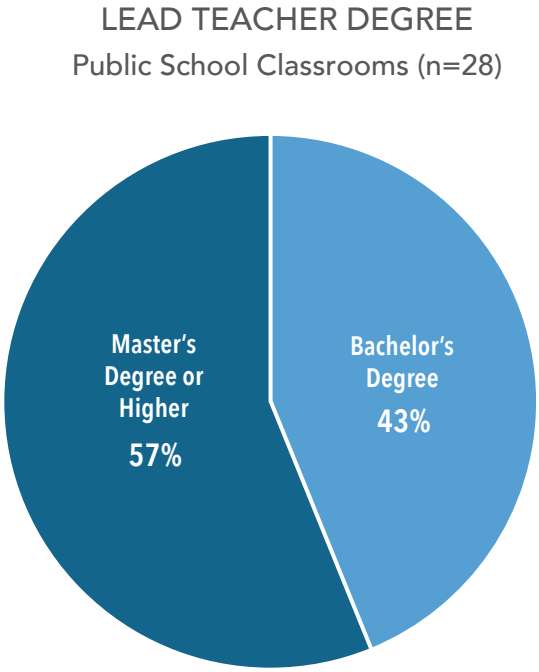
Teacher qualifications varied across mixed delivery classrooms and public school VPI classrooms, yet children achieved similar outcomes across the different settings.

The mixed delivery initiative in Virginia included provisions allowing mixed delivery grantees to obtain waivers for bachelor's degree requirements in private programs that receive VPI funds for mixed delivery slots. As a result, mixed delivery classrooms had more diversity in teacher degree level than public school VPI classrooms, as shown in Figure 7. All public school VPI classrooms had teachers with at least a bachelor's degree, and half of teachers (50%) in mixed delivery classrooms had a bachelor's degree. A large proportion (70%) of the remaining teachers, who did not have at least a bachelor's degree, possessed a child development associate (CDA) credential. In addition, some teachers who had some college coursework or a bachelor's degree also held the CDA credential.[19] While teacher qualifications varied across settings, children experienced similar gains over the program year in math, language, literacy, and self-regulation (as further described in the section "Key Findings for Child Outcomes").

[19] Mixed delivery teachers (n=14): high school diploma or GED (general education diploma)/+CDA = 2, some college/no CDA = 2, some college/+ CDA = 3, bachelor's degree/no CDA = 4, master's degree/no CDA = 3.

FIGURE 7: Teacher Degree Level in Mixed Delivery and VPI Classrooms in 2017–18, Matched Analysis Sample





WHY THIS FINDING MATTERS

Teacher effectiveness has been found to be among the most important factors impacting the quality of pre-K programs and plays a central role in fostering positive child outcomes. For this reason, degree requirements for early childhood educators have been a matter of critical national debate, particularly over the past decade. Supporters often reference studies that suggest teachers with higher levels of education and specialized training are better able to support children's development and school readiness. The fact that nearly half of lead teachers in mixed delivery classrooms hold a bachelor's degree or higher indicates that there has been a strong push in recent years toward professionalization of the field, often through higher education. However, this is also a clear matter of equity and inclusion. As expectations for increased teacher credentials continue to expand, funding for compensation and continuing education has not kept pace. This and other factors have created deep compensation disparities between licensed teachers in the public school sector and teachers with similar degrees doing similar work

in the private or community-based sector. To further complicate this issue, career pathways for early learning professionals are notoriously costly and difficult to navigate, particularly for the nontraditional and in-service adult learners who make up a substantial portion of the community-based early childhood workforce (McCarthy, 2017).

Ironically, although a primary goal of early learning initiatives is to alleviate poverty among young children and their families, this compensation disparity has perpetuated poverty conditions among the early learning workforce (particularly in the community-based sector), who are predominantly women of color and often support children of their own (Whitebook, McLean, Austin, & Edwards, 2018). While the realities and impacts of compensation gaps, their pronounced racial implications, and the need for accessible and equitable career pathways are quite clear, the question remains whether pushing all early childhood teachers to obtain a bachelor's degree is the best and only approach to providing quality early learning programming.

Moreover, findings of this study reveal that although there were differences in teacher degree levels across mixed delivery and public school VPI classrooms, children achieved similar outcomes regardless of differences in teacher degree levels.

This could suggest the opportunity to examine more closely the research and policies that define the degree requirements for early learning teachers in the state. Understanding the variance in credentials among teachers participating in the study will enable VECF and other stakeholders in the state to explore the implications of teacher credentials on other data points of interest.

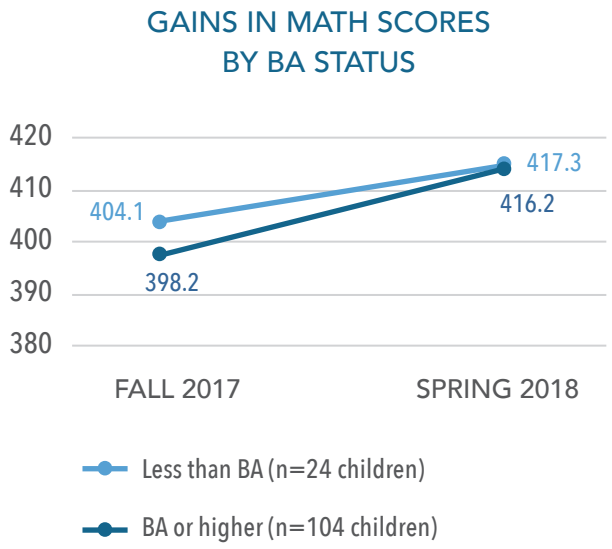
KEY FINDING 5

Lead teacher qualifications were not significantly related to children's literacy, language, or self-regulation outcomes, though they were positively associated with children's math outcomes.

The analysis found no significant relationships between having a lead teacher with a bachelor's degree or higher, or a CDA, and child outcomes in literacy, language, or self-regulation. The analysis found a positive and significant relationship between having a lead teacher with a bachelor's degree or higher and children's math outcomes. The analysis also found a positive and significant relationship between having a CDA and children's math outcomes. It is not clear why having a CDA and having a bachelor's degree were both positively associated with math outcomes.[20] It appears that children had slightly larger gains in math over the program year in classrooms with a teacher who had a bachelor's degree or higher (Figure 8), and had higher spring scores in classrooms with a teacher who had a CDA, but the differences are small in magnitude. It is possible that children may have higher math scores in classrooms with teachers that have both a bachelor's degree and a CDA, but only five such teachers were included in the evaluation so a larger study would be needed to determine whether such a relationship exists.

[20] Neither was significantly related with math outcomes without controlling for the other qualification (i.e., having a teacher with a bachelor's degree was significantly related to math outcomes only after controlling for whether or not the teacher had a CDA, and vice versa).

FIGURE 8: Gains in Child Assessment Scores Among Children in Classrooms That Do and Do Not Have a Teacher with at Least a Bachelor's Degree Fall 2017 to Spring 2018



Note: The chart shows mean fall and spring W scores on the Woodcock Johnson III Applied Problems (Math). The means are for the sample of 128 children used in the analysis of the relationship between mixed delivery participation and child developmental outcomes. Ordinary least squares regression analyses controlled for teacher years of classroom experience and child characteristics, and the standard errors were adjusted to account for clustering of children in classrooms.

WHY THIS FINDING MATTERS

VPI, like many state pre-K programs, has struggled to create viable entry points for early childhood teachers in part because of the inflexibility and lack of clarity around teacher requirements. The current finding, that there was potentially little to no significant difference in child outcomes between teachers with a bachelor's degree or higher and teachers with a CDA, suggests the opportunity to more flexibly define the requirements and associated career pathways for teachers. Continuing to offer the bachelor's degree waiver may enable more access to well-funded and supported pre-K as it is offered in community-based settings that meet the needs and respond to the values of working families.

At the same time, this finding suggests the need for a deeper exploration of what qualifications and characteristics of teachers have a substantive impact on child outcomes, and how that knowledge might impact existing and emerging career pathways. To this end, there are some clues emerging in current research, especially related to outcomes for young children of color and those whose primary language is other than English. Studies have shown that early childhood teachers who are culturally competent and those who share racial and cultural characteristics with children from vulnerable communities are often well prepared to provide these children with high-quality, strengths-based early childhood experiences (Downer et al., 2010). However, preparation gaps along racial lines result in a limited pipeline for teachers of color in early learning programs nationally and within Virginia.

EVALUATION DETAILS

The evaluation examined the relationship between teacher qualifications and child outcomes in both the mixed delivery and public school VPI classrooms, using multiple regression analysis with cluster-adjusted standard errors. The analysis used child characteristics and child assessment data collected for the study combined with data provided by grantees and participating programs on teacher education level, attainment of a child development associate (CDA) credential indicating specialized training in early childhood education, and years of classroom experience. We asked about the CDA separately from teacher education level because many teachers have both a CDA and another degree. All teachers in public school VPI classrooms had at least a bachelor's degree, leading to statistical redundancy with the mixed delivery status indicator, so the indicator of mixed delivery status was not included in the regression model.

The study team ran multiple regression analyses to examine the relationship between teacher degree and credentials, including having at least a bachelor's degree and having a CDA credential, and children's math, literacy, language, and self-regulation outcomes in spring 2018. These analyses used the matched sample of children in mixed delivery and VPI classrooms in Cohort 1 grantee communities. The regression analysis controlled for fall pretest scores, child and family characteristics, and teacher years of experience in the classroom. The regression analyses did not control for mixed delivery participation because no VPI teachers had less than a bachelor's degree, and therefore the analysis could not be run with both teacher degree and mixed delivery participation at the same time. The sample size of this evaluation was quite small for this analysis because the children were grouped into classrooms with a smaller number of teachers, an important limitation of this study. The sample size was too small for multilevel modeling, so the standard errors were adjusted in the regression analysis to account for grouping of children in classrooms.

See Appendix A for additional information about the evaluation methodology.

KEY FINDINGS

PROGRAM QUALITY & CLASSROOM PRACTICES

RESEARCH QUESTION 3:

What are the program quality and teaching practice outcomes for programs participating in the Mixed Delivery Preschool Pilot Program?

In order to meet the needs of young learners, pre-K programs and systems alike have been charged with building and sustaining comprehensive, high-quality teaching and learning environments. Research shows that high-quality preschool programs lead to larger impacts on children's development while enrolled and a greater likelihood that these gains will be sustained after the child leaves the program. For this reason, pre-K programs that focus on and are supported in obtaining higher levels of quality and improving classroom practices are more likely to promote stronger outcomes for young children (Yoshikawa et al., 2013).

For the third research question, the evaluation examined the overall program quality context in both public schools and private settings, as well as teacher practices across the mixed delivery system. Using the framework of Virginia Quality, the study examined how the mixed delivery pilot programs progressed from a quality perspective. Program quality ratings are presented at two time points from the state's quality rating and improvement system, looking at changes in these ratings over time among mixed delivery programs. In addition, teachers from public and private settings in participating communities were invited to report on their classroom practices, as a way to analyze strengths, areas for growth, and possible consistencies and inconsistencies across settings.

KEY FINDING 6

In a one-year period, many mixed delivery programs progressed to higher Virginia Quality ratings.

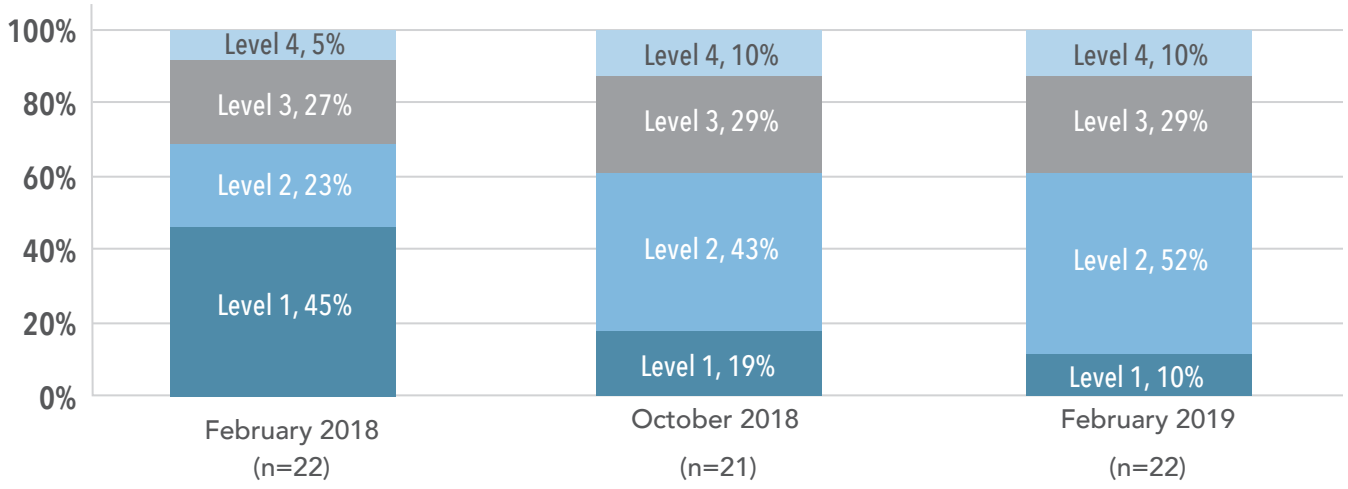
The private programs in the mixed delivery initiative participated in Virginia Quality, the state's quality rating and improvement system. The system is designed to measure and improve the quality of participating programs. Programs enter the system at the first rating level (Level 1)[21] and may progress to higher rating levels as they complete professional development requirements and achieve quality standards for each rating level. The evaluation examined quality ratings for the programs that participated in mixed delivery and had active Virginia Quality ratings (Figure 9) three times over the course of a year. Ultimately, a total of 11 (50%), achieved a higher rating within a one-year period. In February 2018, almost half of the participating programs (45%) had Level 1 ratings. By February 2019, only 10 percent of programs had Level 1 ratings. Additionally, at the one-year mark, there were higher percentages of programs with ratings at Levels 2, 3, and 4.

What is Virginia Quality?

Virginia Quality is the state's voluntary quality rating and improvement system for early childhood programs. The system rates programs on a scale of 1 to 5 based on tiered quality standards and provides targeted professional development to support quality improvement among participating programs.

[21] Programs with specific accreditations or program-wide Head Start or Virginia Preschool Initiative funding may be eligible to "fast track" and enter the system at Level 3; none of the private programs in the mixed delivery pilot were eligible for fast tracking.

FIGURE 9: Percentage of Mixed Delivery Sites at Each Virginia Quality Rating Level: A One-Year Snapshot



Note: One program did not have a rating in October 2018.

WHY THIS FINDING MATTERS

High-quality, coordinated early childhood programs and services have been linked to improved developmental outcomes, lower participation in special education, and higher overall achievement in school (Karoly, Kilburn, & Cannon, 2005; Yoshikawa et al., 2013; Muschkin, Ladd, & Dodge, 2015). Programs that have the strongest positive impact on children's growth and development are those that provide comprehensive curricula, ensure developmentally appropriate environments and interactions for young children by well-prepared teachers, and partner with families to make informed decisions about children's learning and care (Wechsler, Melnick, Maier, & Bishop, 2016). Consistent with this research, these characteristics are what are measured by Virginia Quality (Virginia's Quality Rating and Improvement System).

Findings indicate that one-half (11 of 22) of mixed delivery programs achieved higher quality ratings after one year of participation in the project.

For the enrolled three- and four-year-olds, access to such pre-K programs with important characteristics of quality could lead to promoting the foundational skills and competencies on which all future learning is built (Center on the Developing Child, n.d.). Furthermore, for children who are experiencing poverty and other risk factors, similar to the population served by VPI, participation in pre-K programs that exhibit high-quality attributes has been shown to mitigate the impacts that these conditions have on children's development and chance of success (García & Weiss, 2017).

EVALUATION DETAILS

For this evaluation, we obtained existing Virginia Quality ratings from the Virginia Department of Social Services for 22 programs that participated in mixed delivery. The evaluation used the overall program ratings, which are based on program characteristics, interactions, and progress in the Virginia Quality system. We summarized Virginia Quality ratings by describing the percentage of programs that received each rating level.

See Appendix A for additional information about the evaluation methodology.

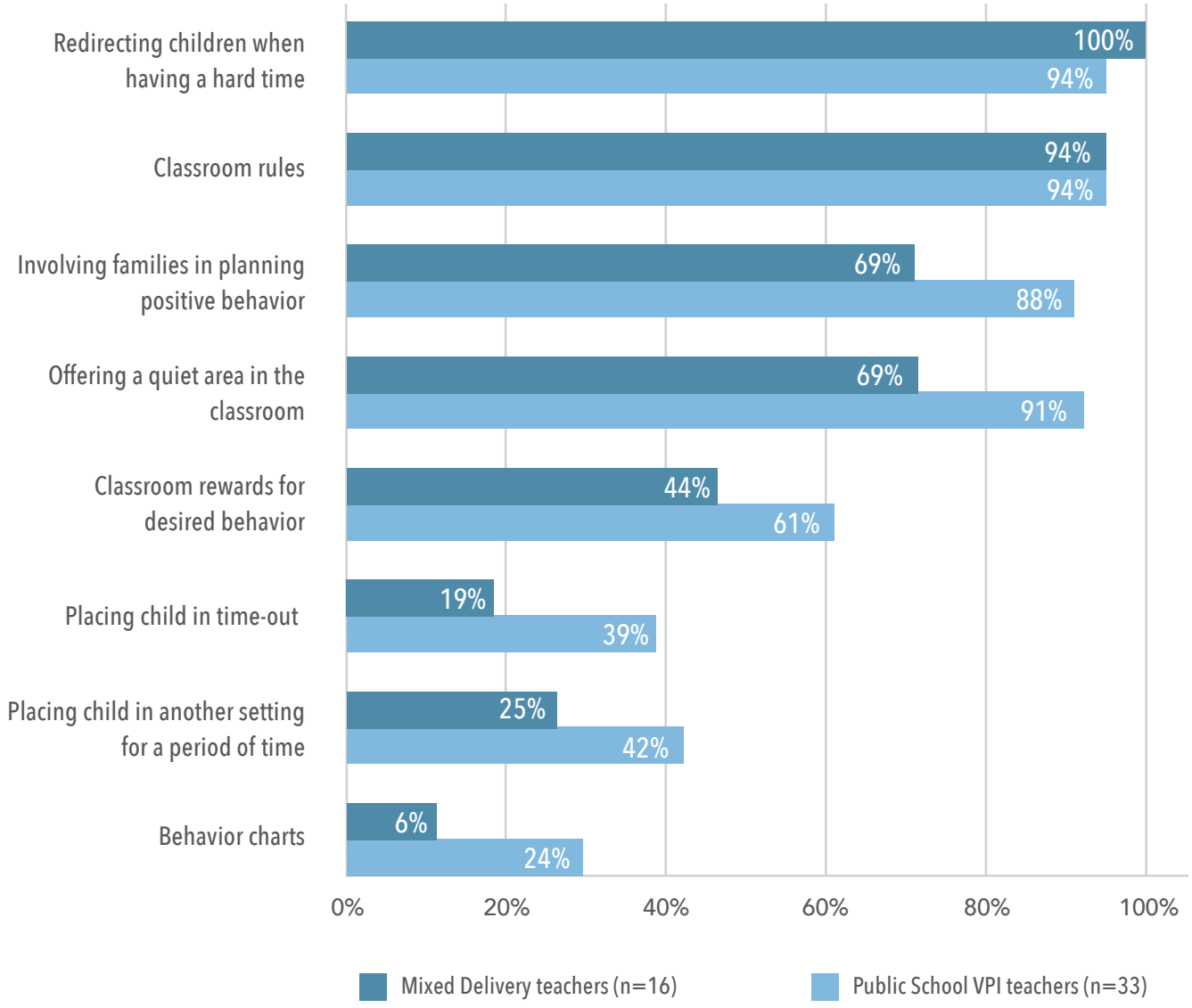
KEY FINDING 7

Teachers in public school VPI programs and in private settings may have different strengths and supports for instruction and interaction, including children's social-emotional development and child assessment.

Social-Emotional Development – Behavior

Among teachers in mixed delivery and public school VPI classrooms, the most widely used strategies for classroom and behavior management include redirecting children's behavior, classroom rules, involving families, and a quiet area in the classroom. Teachers in mixed delivery and public school VPI classrooms were similar in terms of the most- and least-used strategies for classroom and behavior management (Figure 10), but a higher percentage of public school VPI teachers reported using most strategies in comparison with mixed delivery teachers. Almost all teachers reported redirecting children's behavior (100% of mixed delivery teachers and 94% of public school VPI teachers) and use of classroom rules (94% of mixed delivery teachers and 94% of public school VPI teachers). Relatively few mixed delivery teachers and some public school VPI teachers reported removing children from the classroom setting or using time-outs (42% public school VPI and 25% of mixed delivery, and 39% of public school VPI teachers and 19% of mixed delivery teachers) and behavior charts (6% of mixed delivery teachers and 24% of public school VPI teachers).

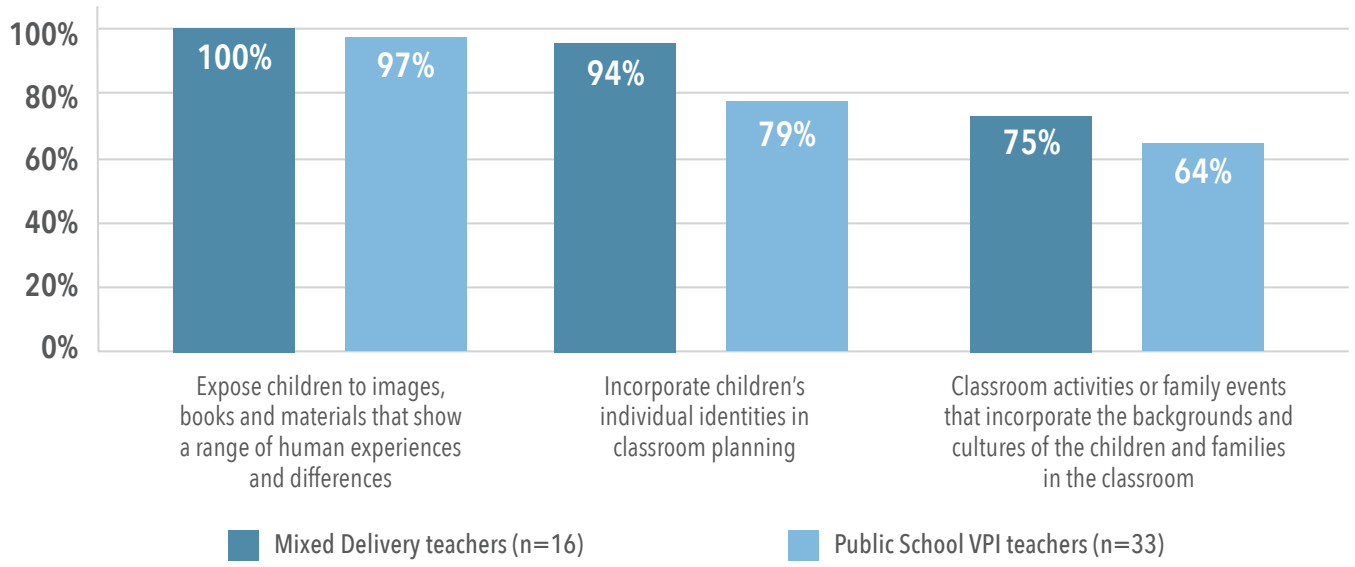
FIGURE 10: Percentage of Mixed Delivery and Public School VPI Teachers Using Strategies for Classroom and Behavior Management, Spring 2018



Social and Emotional Development – Identity and Human Difference

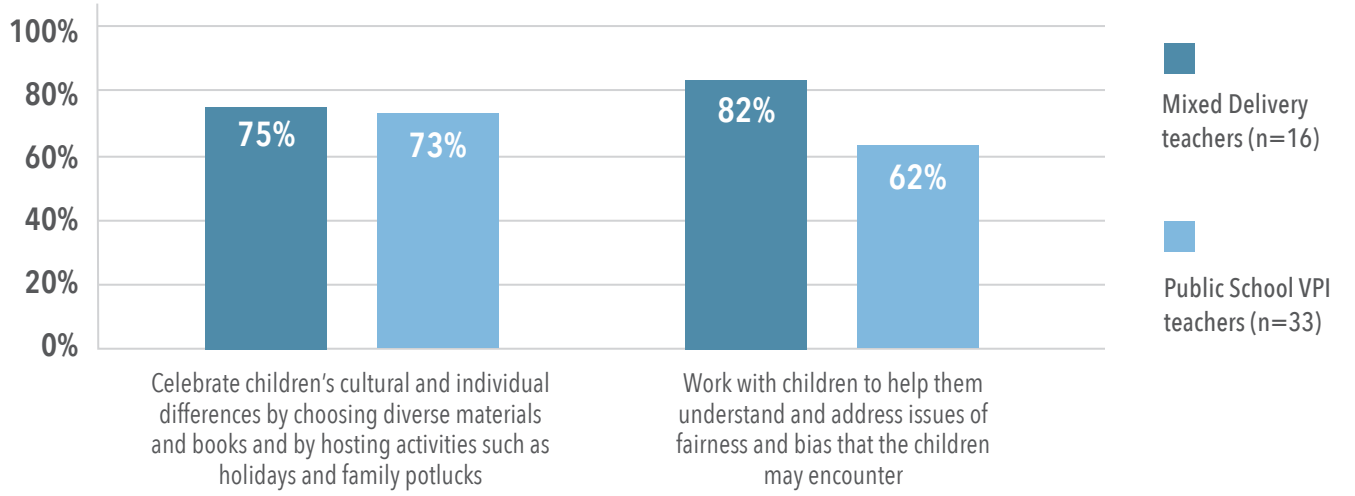
Teachers who participated in the evaluation, especially mixed delivery teachers, used one or more strategies to incorporate children's identities and cultures into classroom planning, and reported a focus on celebrating and addressing human differences as part of classroom practice. All mixed delivery teachers and almost all public school VPI teachers (97%, Figure 11) reported that they expose children to images, books, and materials that show a range of human experiences and difference, such as race and ethnicity, gender and gender roles, religion, cultures, languages, socioeconomic status, or other characteristics. Most mixed delivery teachers (94%) indicated that they also incorporate children's individual identities in classroom planning, such as pictures of children's families, and 79 percent of public school VPI teachers indicated that they do so. Seventy-five percent of mixed delivery teachers and 64 percent of public school VPI teachers reported that they plan classroom activities or family events that incorporate the backgrounds and cultures of the children and families in the classroom, such as holidays and food. These ways of incorporating children's identities in the classroom support children's social development and foster equitable experiences among diverse children in the classroom.

FIGURE 11: Percentage of Mixed Delivery and Public School VPI Teachers Using Strategies to Incorporate Children's Identities and Cultures into Classroom Planning, Spring 2018



Three out of four teachers in both mixed delivery and public school VPI classrooms celebrated children's differences in the classroom, and a higher percentage of mixed delivery teachers explicitly addressed these differences in classroom conversations and activities. About three out of four teachers in the evaluation (75% of mixed delivery teachers and 73% of public school VPI teachers, Figure 12) indicated that they celebrate children's cultural and individual differences by choosing diverse materials and books and by hosting activities such as holidays and family potlucks. Most mixed delivery teachers (81%) reported that they work with children to help them understand and address issues of fairness and bias that the children may encounter, such as exploring gender roles and stereotypes or conversations about skin color; fewer teachers in public school VPI classrooms (67%) reported doing so. Recognizing, discussing, and celebrating human difference contributes to children's social and emotional development and supports equity in the classroom environment.

FIGURE 12: Percentage of Mixed Delivery and Public School VPI Teachers Using Strategies to Address Issues of Human Difference in the Classroom, Spring 2018

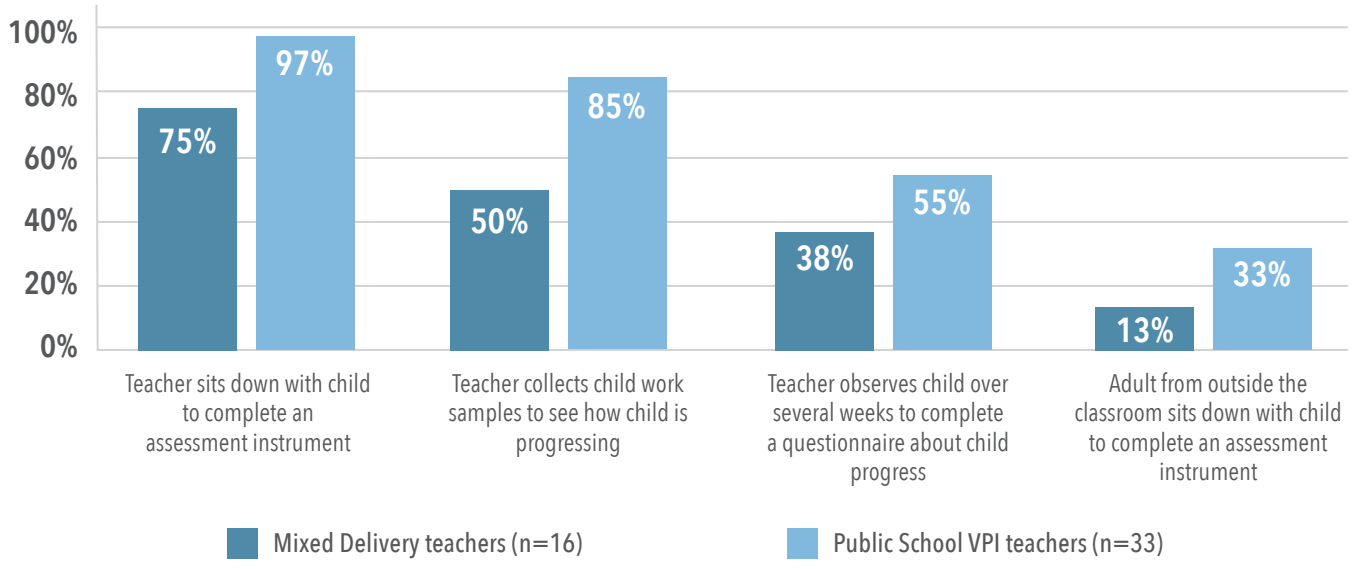


Child Assessment

A much higher percentage of teachers in public schools had designated classroom planning time at least once per week. Among teachers in public school VPI classrooms, 73 percent reported that they had weekly designated time for classroom planning. In contrast, 32 percent of teachers in mixed delivery classrooms had weekly time for classroom planning; the other mixed delivery teachers had no designated time for planning or had it less than once per year.

All teachers in the evaluation assessed children's progress and learning at least twice each year, and teachers used a variety of assessment types. All teachers participating in the evaluation engaged in regular assessments of child progress; all public school VPI teachers and 88 percent of mixed delivery teachers did so at least three times per year. Child assessment in which the teacher sits down with the child to complete an assessment instrument was the most common assessment type, used by 97 percent of public school VPI teachers and 75 percent of mixed delivery teachers. A majority of public school VPI teachers (85%) and almost half of mixed delivery teachers (50%) conducted assessment using examples of children's work to track their progress. A smaller percentage of teachers used other assessment approaches, such as observing children for several weeks to complete a questionnaire or having adults from outside the classroom conduct assessments (see Figure 13). A higher percentage of teachers in public school VPI classrooms reported using each type of assessment in comparison with mixed delivery teachers.

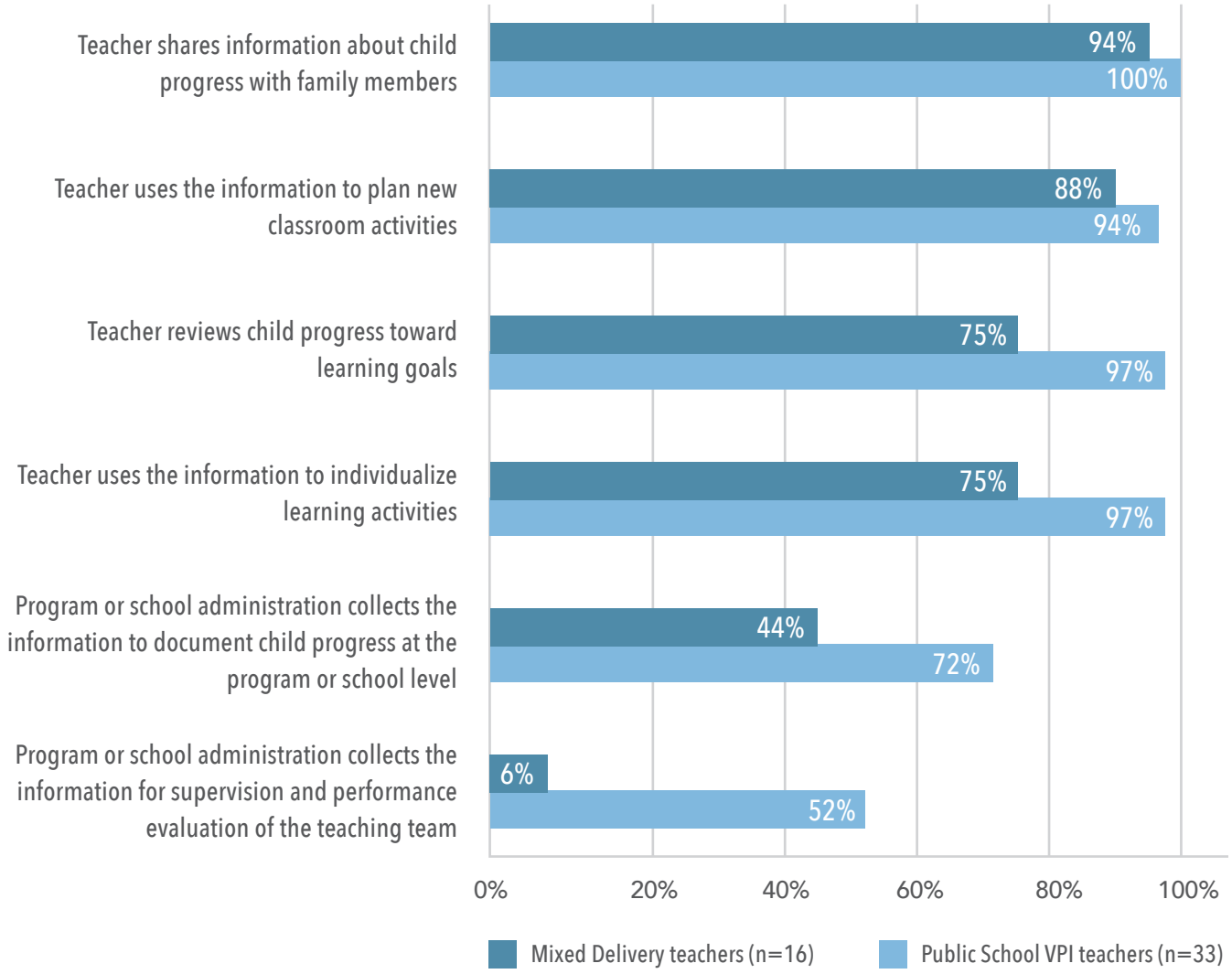
FIGURE 13: Percentage of Mixed Delivery and Public School VPI Teachers Using Methods of Assessing Child Progress, Spring 2018



Teachers in the evaluation used assessment results for family communication and classroom planning, and some teachers—especially in public school VPI classrooms—reported that administrators used the data as well. Most teachers who participated in the evaluation reported using assessment results to share information about child progress with families (94% for mixed delivery and 100% for public school VPI teachers) and for planning classroom activities (88% for mixed delivery and 94% for public school VPI teachers, Figure 14). Almost all public school VPI teachers (97%) and many mixed delivery teachers (75%) used the data to review child progress toward learning goals or individualize learning activities. Many public school VPI teachers (72%) and almost half of the mixed delivery teachers (44%) reported using

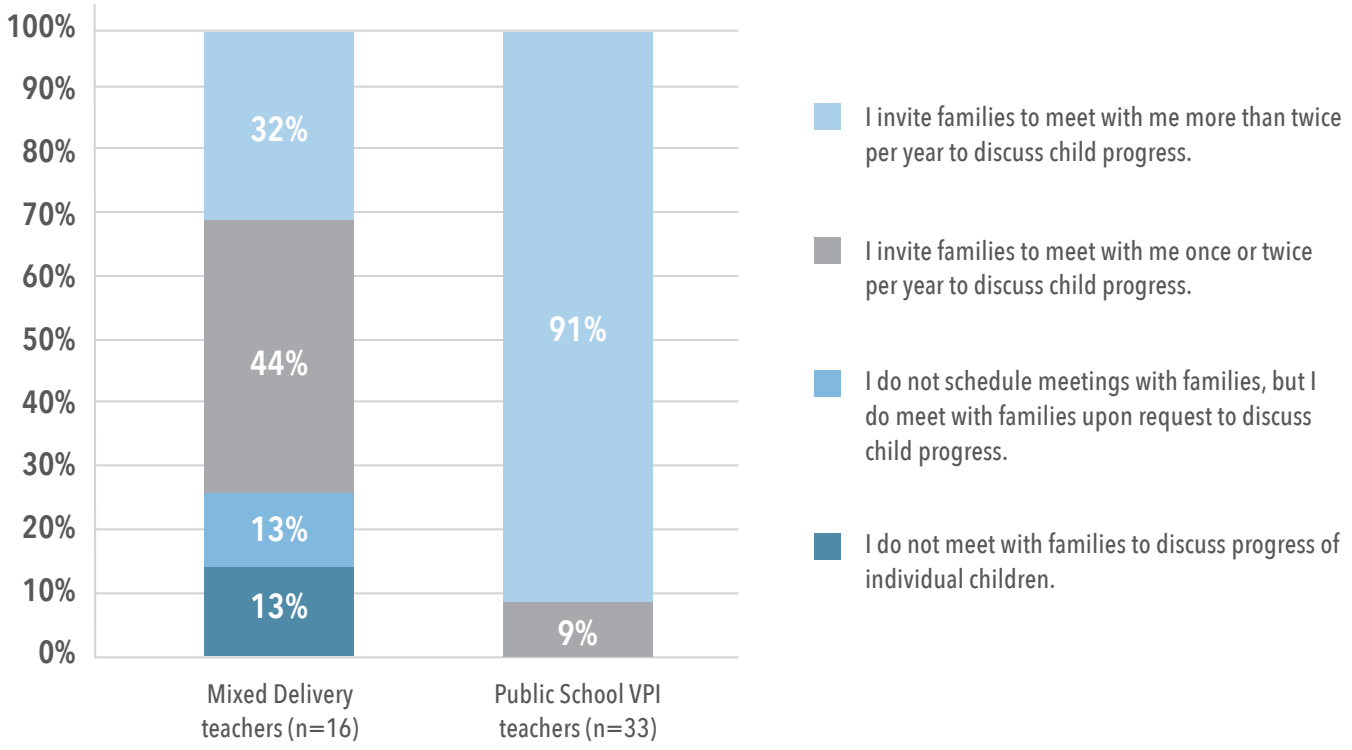
the data to document child progress at the school or program level. Use of the data by administrators for supervision and performance evaluation of the teaching team was more common in the public school VPI setting (52%) than in mixed delivery (6%). A higher percentage of public school VPI teachers reported each way of using the data in comparison with mixed delivery teachers, in addition to using more sources of data as described earlier.

FIGURE 14: Percentage of Mixed Delivery and Public School VPI Teachers Reporting Specific Uses of Child Assessment Results, Spring 2018



Most teachers in the evaluation reported meeting with families to discuss child progress at least once per year (Figure 15). The majority of public school VPI teachers (91%) and some mixed delivery teachers (31%) indicated that they invite families to meet to discuss child progress more than twice per year; an additional 9 percent of public school VPI teachers and 44 percent of mixed delivery teachers invited families to meet once or twice per year. The remaining 25 percent of mixed delivery teachers and 3 percent of public school VPI teachers reported that they do not meet with families to discuss child progress or that they meet for this purpose only upon request. Communication between families and teachers can help to ensure consistency between home and school and can also help to engage family members in the child's early learning outside the home.

FIGURE 15: Percentage of Mixed Delivery and Public School VPI Teachers Meeting with Families at Different Frequencies, Spring 2018



WHY THIS FINDING MATTERS

The way that systems are aligned to support children's learning and teacher practice is a significant driver of quality.

To effectively align public and private pre-K systems, Virginia can benefit by continuing to foster best practices and program quality across both sectors, and by promoting cross-sector sharing of the relative strengths of each sector identified by this pilot project.

With respect to children's social-emotional development, survey results suggested that mixed delivery programs report using strategies that promote children's social competence more frequently and also reported spending more time attending to children's identity and planning for and implementing discussions around human differences. Practices such as these are identified by researchers as being consistent with positive child outcomes and could be prioritized as areas for collaboration and growth across all settings providing pre-K (O'Conner et al., 2017; Humphries, 2016).

In addition, designated planning time on a weekly basis provides teachers with an opportunity to reflect on the progress and needs of children in the classroom and adjust teachers' planned activities and curriculum accordingly. School-based settings may have a more ingrained culture of assessment or administrator expectations around assessment that differ from the private program settings in which the mixed delivery teachers work, and school-based settings may allocate working time for teachers to meet with families while children are not present or in the care of teachers. Mixed delivery

programs often do not have paid planning and assessment time for teachers (because of financial limitations and because teachers are caring for children throughout a full work day—compared with school-day hours), who in turn, may not be able to spend the requisite time during working hours on analysis of child progress and sharing of information with children's families. Comprehensive and developmentally informed assessment is a strong predictor of program quality and positive child outcomes and could additionally be recognized as an area for collaboration and for investment of expanded resources as a core component of pre-K programming (Wechsler, Melnick, Maier, & Bishop, 2016).

EVALUATION DETAILS

For this evaluation, we developed a survey that asked teachers to report on their classroom practices in four broad areas: curriculum and planning, instruction and interactions, assessment of child progress, and family engagement. The survey was designed to ask about practices that are widely used in preschool classrooms and practices that mixed delivery grantees specifically mentioned as priorities for participating programs. We developed the survey using an iterative process that included review by experts in preschool instruction as well as VECF and mixed delivery grantee staff, followed by field testing to validate the survey instrument.

We invited all preschool teachers in the nine Cohort 1 mixed delivery sites and the 14 public school VPI programs that participated in the evaluation to complete the survey on a voluntary basis, and we received 49 responses (16 in mixed delivery programs and 33 in public school VPI programs, a 73% response rate in both mixed delivery and public school VPI programs). We summarized the survey results using frequencies or percentages of mixed delivery and public school VPI teachers who selected each response. The sample size was too small for meaningful statistical comparison, so the frequencies and percentages are presented without information about the statistical significance of any observed differences.

See Appendix A for additional information about the evaluation methodology.

KEY FINDINGS

COMMUNITY LESSONS & BEST PRACTICES

RESEARCH QUESTION 4:

What were the experiences of grantees that implemented the Mixed Delivery Preschool Pilot?

Examining implementation of the mixed delivery initiative provides a lens on the experiences of grantee communities that can inform lessons, best practices, and possibilities for policymaking and future investments.

For the fourth research question, the evaluation team conducted interviews and focus groups with key stakeholders, including families, teachers, and program and community leaders, and reviewed grantee mid-year and end-of-year reports. While the mixed delivery grant was a pilot intended to test the viability of broadening options of quality pre-K for families, it was also very much a systems-building opportunity for the 10 communities that were awarded the grants. Although mixed delivery slots may have included a relatively small number of children in each jurisdiction, communities utilized the chance to advance efforts and focus on broad-based and sustainable impacts to their early childhood systems.

KEY FINDING 8

Mixed delivery communities used the grant opportunity to advance efforts in formalizing shared governance, establishing partnerships, increasing access and using data, building workforce capacity, and leveraging funding.

Formalizing Shared Governance

In the building of every system that will best serve children and families, communities must make critical decisions about governance: how decisions will be made to utilize limited resources, improve programming and policy, and use research and evaluation to inform ongoing efforts in early childhood systems. The mixed delivery grantee communities started their journeys at different levels on a continuum of established governance structures and took a range of approaches. Overall, we found that **formalizing governance, collaboration, and decision making processes are critical elements of success.**

- Grantees highlighted the importance of a strong governance team, both "vision keepers" who bring the diversity and authority to make decisions (including individuals such as school division superintendents and government agency leaders) and implementation teams (including individuals such as program directors and mid-level managers in government agencies).
- Communities also formalized collaborative decision making through clear goals, objectives, role descriptions, memoranda of understanding, and other written agreements, as well as processes for governance and coordination (e.g., membership, frequency of meetings, structure for committees, and communication of decisions to stakeholders).

- Capitalizing on preexisting structures, such as building on prior collaborative partnerships, helped to diversify leadership perspectives and reduced duplication of governance and collaboration efforts directed towards systems building for young children.
- Communities emphasized the importance of having a shared vision and common objectives/outcomes.

Establishing Partnerships

All mixed delivery grantees learned and leveraged a significant amount around the importance of partnerships, the utilization of shared resources, and the benefits and challenges of deep collaboration at the systems and implementation levels. Building on prior partnerships is key to engaging all of the stakeholders necessary to develop a community-wide vision for young children's success.

- Communities emphasized the benefits of partnerships among schools, child care, and Head Start programs. In some communities, the mixed delivery grant was the first opportunity to engage in meaningful two-way communication and partnership, and communities had significant success sharing resources, reducing competition, and increasing collaboration more broadly.
- In discussing potential for sustainability, communities cited expanding engagement and partnering with key decision makers to engender and sustain the work. Specific strategies included continuation of partnerships, shared professional development opportunities, and shared services.

Increasing Access and Using Data

Communities worked to increase access to pre-K for at-risk children through efforts to build streamlined enrollment, reduce competition, and work toward efficient structures for ensuring that children most in need of pre-K services receive them.

- Grantee communities built systems for access, enrollment, and the prioritization of needs - for example, through a single point of entry or common application. Grantee communities also struggled to balance the tasks of serving children and families with working on systems-level efforts that would bolster broader direct service provision.
- The mixed delivery grant offered communities a chance to step back and examine data to identify systems issues that may have been unseen. For example, in areas that are child care deserts, data exploration helped plan for expansion of child care opportunities informed by the need within the community.

Building Workforce Capacity

One of the most significant themes in the Mixed Delivery Preschool Pilot Program has been the value that communities placed on the workforce and the importance of building teacher skills and competencies in support of kindergarten readiness. Communities approached workforce support and capacity building through career advancement, cross-site collaboration among public school and child care teachers, and addressing systems issues that impact workforce well-being.

- Communities utilized several common approaches to upskilling the early childhood workforce, including pooling resources and offering joint professional development to teachers, leaders, and coaches across programs. Teachers were offered diverse opportunities, including micro-credentialing, child development associate training, and site-based training and coaching. Some communities used Virginia Quality as a framework, and most communities targeted investments in coaching and mentoring to increase long-term impacts.

- High rates of teacher turnover were a recurring challenge, causing communities to grapple with the need to reinvest in training as a result of frequent turnover stemming from low salaries and lack of other benefits.
- Communities found that providing incentives to teachers and programs helped encourage teachers to participate in professional development activities.
- Some communities used the opportunity to launch policy-level conversations about workforce compensation and well-being.

Leveraging Funding

Funding was a significant area of focus for the mixed delivery grantees, who leveraged existing and new resources, reflected on ways to reduce duplication and inefficiencies, and gained a clearer sense of direction from a financing perspective. Communities identified a need for strong fiscal expertise, guidance around integrating financing at the community level, and attention to the equitable distribution of resources.

- Several communities defined a clear need for a focus on blending, braiding, and stacking federal, state, and local funds and substantial support for effective strategies at the local level within a birth-to-five framework.
- Communities identified the need for strong fiscal expertise in a mixed delivery model, with clear leadership at the governance level or a collaborative structure so that decisions and discussions included a clear fiscal lens and strategy.
- Overall, grantees expressed successes and optimism as well as challenges related to sustainability in funding. Some strategies to continue mixed delivery work included partnership with local foundations working with the school systems and VPI grants, and engaging businesses in funding strategies.

WHY THIS FINDING MATTERS

As states and communities across the United States are working to expand access to early learning and related services, the most successful efforts to date have worked to align the various systems that impact young children and take a holistic approach to meeting their needs. Such efforts enable streamlined access to programs and services, enhanced accountability, and systematized equitable early learning practices in the preschool years and across the prenatal-through-age-five continuum. Understanding the successes and challenges of Mixed Delivery Preschool Pilot Program grantees, and the lessons learned by them, can help to inform Virginia's efforts to build a holistic birth-to-five early childhood system, support efficiency in scaling future efforts around pre-K and larger early childhood education systems improvements, and create the conditions for alignment of programs and services within Virginia's communities.

EVALUATION DETAILS

The study team used a qualitative analysis approach to analyze the focus group data from the grantee site visits, the telephone interview data with grantees, and any implementation data and reports collected by grantees or submitted by grantees to VECF. The use of multiple sources of qualitative data (i.e., focus groups, interviews, meeting discussions, grantee reports, and work plans) allows for triangulation of the data to help corroborate themes and phenomena that arise during the analysis. Triangulation of evidence also helps address problems of construct validity, as multiple sources of data serve as multiple measures of the same construct (Yin, 2009).

To conduct the qualitative analysis, SRC used a directed content analysis approach (Hsieh & Shannon, 2005), in which the researchers analyzed responses using a qualitative coding scheme based on the mixed delivery theory of change that was developed for the evaluation. The study team developed an a priori thematic coding scheme for the qualitative data and reviewed the coding scheme after collection of the data to determine whether any additional codes should be added before coding began. For the coding process, the thematic codes were applied directly to transcribed qualitative data (such as transcriptions of focus groups, interviews, and meetings) and grantee documents (such as annual reports and work plans). After coding was completed, the team retrieved all qualitative data sources that had been flagged with a specific code in order to conduct a comprehensive and triangulated analysis within each thematic code.

See Appendix A for additional information about the evaluation methodology.

INSIGHTS

TO GUIDE FUTURE EFFORTS

Following are a summary of key findings and insights for consideration to inform future policy, implementation, and evaluation. The key findings provide important information that can help Virginia discern how to reform and improve its early childhood education programs to better fit the realities of families with children from birth to five years old, while also building the capacity of the birth-to-five ecosystem of public and private partners across settings. The insights, derived from the study findings, support Virginia's progress to position investments in mixed delivery and expanding pre-K programs not only as an equitable education investment but also as an important economic strategy. These insights encourage Virginia to build upon its longstanding commitment to strengthen early learning programs and systems and promote positive outcomes for children before they enter kindergarten, and affirm that the path to a thriving and prosperous Virginia begins with investment in young children.

SUMMARY OF KEY FINDINGS

The results of the study show a significant amount of promise for the Mixed Delivery Preschool Pilot Program and for the broader implementation of a mixed delivery public preschool model in Virginia, as demonstrated by both impact outcomes and also implementation findings. The state investment in communities' exploration of this important option helped to highlight the following:

- The positive impact that mixed delivery programs can have on children's developmental outcomes **(Ready Children – Key Findings 1, 2, 3)**
- The effectiveness of classroom teachers across a range of settings and qualifications leading to important benefits for children's school readiness outcomes **(Effective Teachers – Key Findings 4, 5, 7)**
- Important quality improvement and systems-building efforts taken on by mixed delivery communities in their work to increase quality and meet the range of needs and desires of families in their efforts to access high-quality public preschool options **(Systems-Focused Communities – Key Findings 6 and 8)**

Key Findings

1. Children in mixed delivery classrooms showed substantial growth in literacy skills during their preschool year, and had PALS-PreK scores that met or surpassed developmental milestones at the end of preschool.
2. The majority of children in both mixed delivery and public school VPI classrooms had language, literacy, and math scores that met or exceeded typical scores for their age group in the spring of their preschool year.
3. Matched children in mixed delivery and public school VPI classrooms had similar spring scores, on average, in math, literacy, language, and self-regulation.

Key Findings (cont'd)

4. Teacher qualifications varied across mixed delivery classrooms and public school VPI classrooms, yet children achieved similar outcomes across the different settings.
5. Lead teacher qualifications were not significantly related to children's literacy, language, or self-regulation outcomes, though having **a bachelor's** degree and having a CDA were positively associated with children's math outcomes.
6. In a one-year period, **many mixed** delivery programs progressed to higher Virginia Quality ratings.
7. Teachers in public school VPI programs and in private settings may have different strengths and supports for instruction and interaction, including children's social-emotional development and child assessment.
8. Mixed delivery communities all advanced in formalizing shared governance, establishing partnerships, increasing access and using data, building workforce capacity, and leveraging funding.

INSIGHTS

Informed by key findings from the evaluation, these insights are organized into three key areas – Ready Children, Effective Teachers, and Systems-Focused Communities – to provide a guiding framework for discussing potential actionable strategies for advancing early learning in Virginia. The insights around policy, implementation, and evaluation may be used by state policymakers, policy organizations like the Virginia Early Childhood Foundation, local communities, or researchers and evaluators who are examining the early childhood system in Virginia.

Ready Children

Simply put, the mixed delivery grant successfully increased access to public pre-K programs for Virginia's at risk four-year-olds. Overall results for both cohorts show that the pilot project successfully increased the percentage of publicly funded slots that are in private settings. Children in both public school and private center classrooms demonstrated positive developmental progress and school readiness outcomes; and those outcomes were comparable across public and private settings. Families provided significant positive feedback about the benefits of mixed delivery and welcomed the opportunity to enroll their child(ren) in a private setting. Parents also suggested ways to help families make more informed choices when selecting a pre-K option.

- Virginia could consider continued expansion of the mixed delivery model, especially in communities that have lower enrollment (unused slots) in the Virginia Preschool Initiative. The results of the study showed that mixed delivery children (being served in private settings) were prepared at similar levels for pre-K to those children who attended VPI in public school classrooms. The state may also consider updates to the VPI funding formula, ensuring that communities can adequately support robust programming for at risk children in Virginia.

- Communities could further explore family preferences, working to understand what families prioritize as they choose preschool for their child(ren), and what types of options would best meet the needs of more Virginia families (i.e. more options with full day/full year care).

- Virginia could continue to have grantees and local communities participate in and serve as key advisors on the design and implementation of ongoing evaluation and storytelling activities involving the expansion of replicable models of mixed delivery and other early childhood systems-focused evaluation.

Effective Teachers

The study was heavily focused on the workforce, looking at the efficacy of teachers with a variety of degrees across multiple settings. While the scope of the pilot study and the limited size of the sample warrant further research, the study suggests that teachers across all public and private settings effectively prepared children for their kindergarten experience. Several issues around the workforce were accentuated in the study and can be emphasized alongside Virginia's significant efforts to build a comprehensive approach to workforce upskilling and compensation. Additionally, school-based preschool programs and mixed delivery programs had different strengths and supports, evidencing the possibilities of collaborating to ensure alignment of practices and approaches to children's learning, family engagement, and other program features of VPI.

- In communities utilizing the mixed delivery model to deliver VPI, Virginia could continue to offer the bachelor's degree waiver for private programs. Children with teachers who did not have a bachelor's degree were similarly "school ready" in almost every area of cognition and learning (excepting math, for which both teachers with a CDA and those with a bachelor's degree drove a boost in child outcomes).

- Private programs are more likely to employ lower-income women of color. State policymakers and leaders could build on the work of the School Readiness Committee Compensation Workgroup to examine parity in compensation for teachers in publicly funded (VPI) private programs. Efforts around compensation of teachers should include a broad definition of compensation to include planning time, length of school day, and so on. A specific focus of compensation parity could be ensuring funding supports for private programs participating in VPI around teacher planning time and resources to conduct ongoing assessment and share information regularly with families.

- Virginia communities recognize the demonstrated value of a teaching population that racially and culturally matches the child and family population. The state could consider expanding resources supporting a variety of upskilling alternatives for teachers in private programs, including through Project Pathfinders and registered apprenticeships, as well as locally designed options that include credit-bearing professional development (i.e., micro-credentialing) and connection to certifications. Connecting this important and often marginalized segment of the workforce to college coursework and continuing credentials is a critical issue of equity and was indicated as a positive outcome of the mixed delivery pilot.

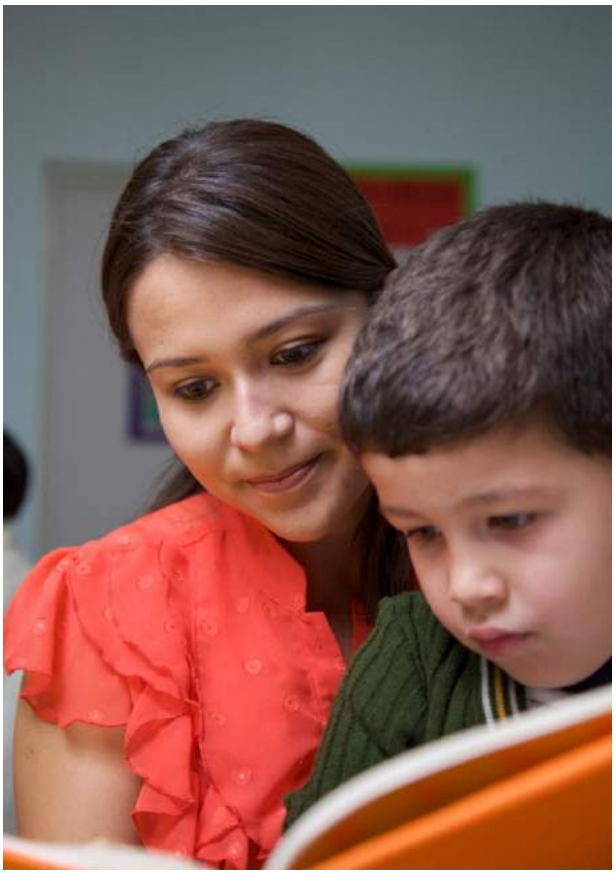
- Collaboration across the mixed delivery system could be increased by creating more opportunity to build peer learning communities and offer additional professional learning for teachers across settings to leverage the strengths of

both school-based preschool and private programs. Such strategies could be used to improve alignment of practices and approaches to consistently and comprehensively support children's learning, family engagement, and assessment practices among other aspects of program quality.

- State decision makers and implementers might consider setting priorities and measuring outcomes around the key program features of VPI across all systems (i.e., assessment and reporting to families, children's social-emotional development, clear focus on mathematics instruction, etc.).

Systems-Focused Communities

Several of the key findings lend themselves to thoughtful state policy and the continuation of local innovation toward strong and aligned governance of early childhood systems. Because the state (via the School Readiness Committee) is also undergoing an examination of governance, it may be an opportune time to consider the alignment of state and local governance systems. Attention may be directed toward policy development that will be supportive and limit restrictions to communities working on elevating and aligning systems building through existing models. Additionally, the study found community partnerships at the center of effective mixed delivery systems. Communities that participated in the mixed delivery grant engaged in the hard work of collaboration across systems: engaging a wide stakeholder base; sharing professional learning and development; implementing shared service models; and developing community-wide goals for children, families, and programs. Finally, data usage among grantee communities helped to identify broader systems issues in the early childhood local landscape; however, there were data gaps encountered by the study team that, if alleviated, could provide a much clearer picture of Virginia's successes with its youngest learners.



- As the School Readiness Committee continues to consider the most appropriate governance models for early childhood within the state, the committee could also consider approaches to ensuring that localities are afforded the opportunity and flexibility to innovate and create governance structures that work for their communities. This may include conducting a review of existing state policies to ensure they do not impede the creation of mixed delivery governance structures at the community level.

- Virginia could incentivize collaboration among schools and private partners in order to draw down maximum VPI funds (i.e., forgiving a percentage of the local match when communities can demonstrate a percentage of VPI slots will be placed in private settings).

- The state could consider the development of waivers, technical assistance, or both to help communities to braid, blend, or stack federal, state and local funds in support of mixed delivery systems (some work is already occurring in communities around blending federal child care funds).

- The state could provide increased funding for local jurisdictions as they continue to innovate and develop systems that increase alignment and efficiency, such as the single point of entry approach tested out in grantee communities.
- Important collaboration opportunities could be leveraged and expanded between private preschool educators and leaders and their colleagues in school-based VPI programs. Promising activities among mixed delivery programs included shared professional development for teachers and leaders, sharing key resources, and collaboratively planning to enhance practice. Virginia could also continue to invest in systematic support from shared service models to sharing of local innovation through strong communities of practice across communities.
- The state could support communities, through additional funding or technical assistance, in using data to ensure adequate coverage for pre-K geographically (especially in more rural areas), and clear evidence of locating and targeting services to populations of at-risk children and families.
- Virginia could work to identify and implement a system to assign student IDs to mixed delivery and other children in private settings in order to be able to continue to track outcomes and progress into the K–12 system.

During the Mixed Delivery Preschool Pilot Program, 10 Virginia regions were able to increase access to preschool for eligible children, embed local child care businesses into the fabric of the pre-K system, support program quality, and build local private-public partnerships. These efforts, and the next steps that follow, will ultimately positively impact the system of preschool in Virginia and benefit the state's youngest learners and their families.

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APPENDIX A: RESEARCH METHODOLOGY

Appendix A provides additional information about the research methodology used for the evaluation, including the implementation study methods and the outcomes study methods.

OUTCOMES STUDY METHODS

The outcomes study draws from several types of quantitative data, including data collected for the evaluation and existing state data. The data collected for the evaluation includes child assessments, child characteristics, program and classroom characteristics, and a survey of teaching practices. The existing state data includes children's Phonological Awareness Literacy Screening (PALS)-PreK scores and Virginia Quality ratings. The study team used these sources of data for a series of descriptive and inferential analyses to address research questions 2, 3, and 4.

The following provides a description of the sample and measures for each data source, followed by the analysis methods and data sources used for each research question in the outcomes study.

Child Characteristics

To collect data on child characteristics, we asked family members of children enrolled in mixed delivery classrooms, and in a comparison group of VPI classrooms, to complete a short questionnaire with information about family and child demographics and other characteristics. The child characteristics questionnaires were completed by family members at the same time that they completed consent forms for their children to participate in the evaluation, in the fall of 2017.

In summer 2017, the study team obtained agreements to participate in the evaluation from the nine private programs participating in the mixed delivery initiative in Cohort 1 grantee communities, and from 14 public schools with VPI classrooms located in the same communities that served as a comparison group. In fall 2017, the study team partnered with a site liaison in each participating program or school to obtain family consent to participate in the evaluation and a completed questionnaire about child characteristics, from families of children in mixed delivery slots in the private programs and from families of children in VPI slots in the public schools. The consent forms and questionnaires were available in English and Spanish.

Sample. We collected child characteristics data in fall 2017 in the five Cohort 1 grantee communities, including children enrolled in mixed delivery classrooms and VPI classrooms in public schools. We asked site liaisons to distribute the consent forms and questionnaires to all families of children enrolled in mixed delivery slots in private programs, and to all families of children enrolled in VPI classrooms in the public schools. We received consent to participate in the evaluation, and child characteristics data, from 344 children, including 108 in mixed delivery classrooms and 236 children in VPI classrooms.

Measures. The questionnaire collected information about the child's gender, the child's race and ethnicity (white non-Hispanic, black non-Hispanic, Hispanic any race, and other races non-Hispanic), if English is the primary language spoken at home, if the child has an individualized education program (IEP) or not, the mother or other primary guardian's highest education level (less than high school diploma or GED, high school diploma or GED, some college, associate's degree, bachelor's degree, master's degree or other graduate degree), the child's prior experience with early childhood education (if the child had any prior child care or preschool, and if so if this was in a center-based program), and literacy practices in the home (frequency of adult reading to child at home).

Child Assessments

We conducted individual child assessments with a sample of children in mixed delivery classrooms and in public school-based VPI classrooms in the same communities. We conducted child assessments in the fall of the preschool year as a baseline measure, and in the spring of the preschool year to measure child developmental outcomes. Child outcomes were measured in the spring in order to have a consistent time point near the end of the program year; not all programs operated in the summer.

The child assessments used two instruments, the Woodcock-Johnson III and the Head Toes Knees Shoulders, and measured four domains of early learning: literacy, language, math, and self-regulation. Assessments were completed in fall 2017 and again in spring 2018 with children in the child assessment sample, described below.

Child assessments were completed by field staff who worked for the evaluation team and completed training on each instrument as well as the study's data collection protocols. The study team included one data collector in each of the five grantee communities who conducted all English-language child assessments, and a bilingual assessor who traveled to each grantee community to conduct all Spanish-language child assessments. Before conducting observations independently, data collectors were required to pass a certification on the assessment battery at a rate of 80 percent. During the data collection cycle, data collectors were shadowed by a lead data collector and participated in fidelity checks to ensure they were maintaining reliability to the measures and protocols.

Sample. We conducted child assessments in the 2017–18 program year with selected children in the five Cohort 1 grantee communities, including children enrolled in mixed delivery classrooms and VPI classrooms in public schools. The children included in the child assessment sample included eligible children who returned completed consent forms and child characteristics questionnaires (described earlier). We received consent to participate in the evaluation, and child characteristics data, from 344 children, including 108 in mixed delivery classrooms and 236 in VPI classrooms. A total of 58 children were excluded from the sample after randomization, resulting in a sample size of 286 children.

The child assessment sample included children who could be assessed in English or Spanish. To determine the language of assessment, we conducted an English language screening with children whose home language was a language other than English and who were identified as dual language learners by their classroom teachers. If children passed the screening, they completed assessments in English. If children did not pass the screening and spoke Spanish, they completed assessments in Spanish. If children did not pass the screening and spoke a different language, they did not participate in child assessments for this evaluation. A total of six children did not participate for this reason.

We completed child assessments with 261 children in fall 2017, including 93 children in mixed delivery classrooms and 169 children in VPI classrooms. In spring 2018, we completed child assessments with 240 children, including 85 children in mixed delivery classrooms and 155 children in VPI classrooms. Ultimately, the sample experienced a loss of 46 children due to availability issues (i.e., absences and withdrawals), student refusals, or language or IEP needs. A total of 229 children with complete data were included in the child outcomes analysis using propensity score matching, described further in the analysis methods section below.

Measures. The child assessments were conducted in English or Spanish as appropriate. To measure early language, literacy, and numeracy skills, we used the Woodcock-Johnson III (WJ-III; Woodcock et al., 2001), a standardized, nationally norm-referenced achievement test with reliability demonstrated by high internal consistency (alphas ranging from .76 to .91). We used the Batería III Woodcock-Muñoz (Muñoz-Sandoval et al., 2005), the aligned Spanish version of the WJ-III, with children who did not pass the English language screening and spoke Spanish. We used three subtests of

this instrument that are frequently used in other research on early childhood programs: the Letter-Word Identification subtest (a measure of early literacy skills), the Picture Vocabulary subtest (a measure of language skills), and the Applied Problems subtest (a measure of early math skills). The Letter-Word identification subtest assesses children's ability to identify letters and words. The Picture Vocabulary subtest assesses children's receptive and expressive vocabulary. The Applied Problems subtest assesses early numeracy skills including counting, addition, and subtraction.

For this study, we examined two types of Woodcock Johnson III results: W scores, which describe the child's level of development, and classifications on the Woodcock Johnson III Relative Proficiency Index, which describe the child's performance relative to a typical child of that age. The W score is calculated using software provided by the developer, which uses Rasch modeling to transform the raw score into an equal-interval scale that is equivalent for the English and Spanish versions of the instrument. The Relative Proficiency Index uses children's raw scores on each subtest to classify children into eight separate categories of proficiency relative to other children of similar ages nationally. For this study, we created an indicator of whether or not children met or exceeded typical scores for their age group using the following approach: children who did not meet or exceed the normal score range had Relative Proficiency Index classifications of "Severely Impaired," "Moderately Impaired," "Mildly Impaired," and "Mildly Impaired to Within Normal Limits"; children who met or exceeded the normal score range had Relative Proficiency Index classifications of "Within Normal Limits," "Within Normal Limits to Advanced," "Advanced," and "Very Advanced."

To assess self-regulation skills, we used the Head Toes Knees Shoulders (HTKS) measure (Ponitz et al., 2008). This measure involves an activity in which children are asked to exhibit an opposing response when asked to do something (such as touch their toes when asked to touch their head). The activity involves working memory, cognitive flexibility, and inhibitory control, thus providing a good measure of executive function and self-regulation, and has high internal consistency (alphas ranging from .92 to .94). The HTKS was administered in English or Spanish as appropriate. For this study, we reported raw scores on the HTKS.

Program and Classroom Characteristics

To collect data on program and classroom characteristics, we asked site liaisons in the grantee agencies to collect information from each program and classroom teacher, in programs with children participating in the child assessments for the evaluation. Site liaisons were provided with a short questionnaire to complete for each program and another short questionnaire to complete for each preschool classroom in each program. The program and classroom questionnaires were completed in the 2017–18 program year.

Sample. We collected program and classroom characteristics data in the 2017–18 program year in the five Cohort 1 grantee communities, including nine private programs participating in the mixed delivery initiative and 14 public schools with VPI classrooms located in the same communities that served as a comparison group. This data includes information about 19 classrooms and their affiliated teachers at private programs and 25 classrooms and their affiliated teachers at VPI classrooms in public schools.

We also collected program and classroom data in the 2018–19 program year from 16 private programs and seven family child care providers participating in the mixed delivery initiative in the five Cohort 2 grantee communities. Only 13 programs provided classroom characteristic data; as a result we have information about 14 classrooms and their affiliated teachers for Cohort 2 communities. The study team obtained agreements from each site to participate in the study in summer 2017 and fall 2018, respectively.

Measures. The program questionnaire collected information about program type (school-based or private), schedule (number of days of operation and school-year, full-year, or other operation schedule), enrollment (number of enrollment

slots by age and by part-day, full-day, or extended-day), and funding sources (number of slots funded by VPI, VPI+, Head Start, child care subsidies, and other funding; and information about blended funding).

The classroom questionnaire collected information about the entire classroom, including the enrollment (number of slots by age), the required adult-child ratio in the classroom, and the number of teaching staff who regularly work in the classroom. The classroom questionnaire also collected information about each teaching staff member in the classroom, including role in the classroom (lead teacher, co-teacher, assistant teacher, or aide), highest education level (less than high school diploma or GED, high school diploma or GED, some college, associate's degree, bachelor's degree, master's degree or other graduate degree), child development associate credential (yes, no, working on it), coursework in child development (yes, no, working on it), any licenses or credentials the teacher has achieved (name of license or credential), and teaching experience (number of years).

Survey of Teaching Practices

The study team conducted a voluntary survey of teachers in mixed delivery and school-based VPI classrooms that participated in the child assessment part of the evaluation, to collect information about teaching practices in these classrooms. The survey data were collected via a web-based survey in the spring of 2018. Survey participation was voluntary, and teachers who completed the survey received a $25 gift card to thank them for their time.

The study team developed and piloted the survey instrument for this evaluation. The survey was designed to measure the use of teaching practices that the mixed delivery grantee agencies identified as best practices and encouraged participating mixed delivery programs to use. To develop the survey, the study team first met with grantee staff to identify the specific teaching practices to include in the survey. The study team developed a draft survey using survey research design principles, such as neutral wording, asking about only one practice at a time, and avoiding ambiguous language. School Readiness Consulting staff members with expertise in teaching practice, who were not on the study team, reviewed the survey instrument for content accuracy, and provided feedback. The study team revised the instrument and programmed the survey into an online survey software platform. The web-based survey was beta tested by School Readiness Consulting staff members who were not on the study team. Finally, the survey was piloted with six local preschool teachers who were not part of the study to ensure that the survey questions and response options were understandable and answerable. The survey was then finalized and administered to study participants over an 11-week period in spring of 2018.

Sample. In spring 2018, we collected survey data from 49 preschool teachers in the five Cohort 1 grantee communities, including 16 teachers in nine private programs participating in the mixed delivery initiative and 33 teachers in 14 public schools with VPI classrooms located in the same communities who served as a comparison group. In each private program and school participating in the study, the study liaison provided the study team with email addresses for the lead teacher (or co-teacher who could best respond to the survey) in each preschool classroom in the school or program. The survey was sent to 67 teachers, including 22 in mixed delivery classrooms and 45 in public school VPI classrooms, and had a 73 percent response rate in both mixed delivery and public school VPI classrooms.

Measures. The survey included questions about four broad topics: curriculum and planning, instruction and interactions, assessment of child progress, and family engagement. The survey was designed to collect quantitative data and included a combination of yes/no responses and multiple-choice responses. Questions that included an "other" response category also provided respondents with the opportunity to describe the other category with open-ended text.

In the curriculum and planning topic, the survey asked about the frequency of classroom planning time, the use of individual learning goals to inform classroom activities, adaptation of activities for children with different abilities, the

specific curricula and activity resources used and how they are used in the classroom, incorporation of children's identities and cultures into classroom planning, how human differences are addressed in the classroom, and adjustments to the classroom environment in response to children's preferences or needs.

In the instruction and interactions topic, the survey asked about time spent in different types of activities (large-group instruction, small-group activities, one-on-one activities, free play or choice time, transitions, meals and snacks, rest time, and other), time spent on different topics (vocabulary and language, letters and reading and writing, numbers and counting and mathematics, social-emotional development and interactions and skills, science and observation of the world, community and cultural practices, art and music, and other), strategies used for classroom and behavior management, and approaches to support children with specific needs or risks (children with special needs, English learners, children exposed to trauma, and other).

In the assessment of child progress topic, the survey asked about how children's learning and progress are assessed, the frequency of assessment, and how assessment results are used.

In the family engagement topic, the survey asked about the frequency of meetings with family members to discuss child progress, strategies used to develop and maintain relationships with families who have a different background from the respondent, and how information about the curriculum and classroom activities is shared with families.

PALS-PreK Literacy Scores

In addition to the child outcomes data collected for the study, we also collected existing PALS-PreK score data. The PALS-PreK (Invernizzi et al., 2004) is a phonological awareness and literacy screening instrument that is collected by teachers in preschool classrooms, to measure preschoolers' literacy skills and provide information teachers can use to support child literacy development in their classrooms. Teachers in public preschool classrooms (including VPI, Head Start, and other publicly funded preschool programs) and mixed delivery classrooms in Virginia assess child literacy skills in the fall and spring of the preschool year using the PALS-PreK instrument.

Sample. In summer 2018, VECF provided available pre-K literacy data from each of the 10 grantees to the evaluation team. This included data from 2016–17 for Cohort 1 mixed delivery programs, and 2017-18 data for mixed delivery programs from both cohorts. Data was available for 54 children in the 2016-17 program year (Cohort 1) and 94 children in the 2017–18 program year (Cohorts 1 and 2).

We also obtained data for children enrolled in public school VPI classrooms in the same jurisdictions during the 2016–17 and 2017–18 school years from the Virginia Department of Education. Data were available for 1,618 children in the 2016–17 school year and 1,632 children in the 2017–18 program year.

Measures. The PALS-PreK was designed by researchers at the University of Virginia to measure children's early literacy skills that are associated with later reading success. The PALS-PreK scores are collected by teachers rather than independent assessors, and the instrument developers demonstrated the validity and reliability of the PALS-PreK with high internal consistency (Cronbach's alpha ranging from .75 to .93), high inter-rater reliability (.99), and reasonably high correlations with other early literacy assessments (Invernizzi et al., 2004). The PALS-PreK includes several subtests measuring name-writing ability, uppercase and lowercase alphabet recognition, letter sound and beginning sound production, print and word awareness, rhyme awareness, and nursery rhyme awareness. Table A1 provides information about the scoring of each subtest. In this evaluation, we examined only those subtests completed by all children.

TABLE A1: Description of PALS-PreK Subtests

PALS-PreK Subtest	Maximum Score	Spring of Preschool Year Development Levels	Use of Subtest
Name Writing	7	5-7	All complete
Upper Alphabet	26	12-21	All complete
Lowercase Alphabet	26	9-17	Only if score above 19 on Upper-Case Alphabet
Letter Sounds	26	4-8	Only if score above 9 on Lower-Case Alphabet
Beginning Sound	10	5-8	All complete
Print & Word Awareness	10	7-9	All complete
Rhyme Awareness	10	5-7	All complete
Nursery Rhyme Awareness	10	6-10	All complete

Source: Invernizzi, M., Sullivan, A., Meier, J., & Swank, L. (2004). Phonological Awareness Literacy Screening (PALS) Pre-K Teacher's Manual. Richmond, VA: University of Virginia. Retrieved from https://pals.virginia.edu/public/pdfs/rd/tech/Pre-K_technical_chapter.pdf.

Note: Spring developmental levels are provided by the instrument developers as guidance for scoring expectations for four-year-old children's literacy development.

Virginia Quality Ratings

Virginia Quality is the state's quality rating and improvement system. Virginia Quality ratings are an existing source of data on the quality of early learning programs in Virginia. For this evaluation, we obtained existing Virginia Quality ratings from the Virginia Department of Social Services. Programs participate in the Virginia Quality system on a voluntary basis, and they receive a rating based on program characteristics, interactions, and progress in the system. The evaluation used the overall program ratings for Virginia Quality. The evaluation did not use scores from Virginia Quality classroom observations, using the Classroom Assessment Scoring System or the Environmental Rating Scales, because these observations are conducted only for higher rating levels, and very few programs in the evaluation had completed these observations at the time the data were collected.

Sample. We asked the Virginia Department of Social Services to provide Virginia Quality ratings for all mixed delivery programs and for all public school VPI classrooms in participating communities in spring 2018 and spring 2019. The majority of the programs and schools where we conducted child assessments (Cohort 1) were assigned quality level rat-ings, with the exception of two public schools. There was limited information regarding CLASS and ECERS; data were available for only three mixed delivery programs, one in Cohort 1 and two in Cohort 2.

Measures. Virginia Quality ratings are on a scale of 1 to 5, and higher ratings indicate higher tiers of quality. Programs must meet all requirements of each rating level in order to proceed to higher ratings (for instance, to achieve a rating of 3 a program must meet all criteria for levels 1 and 2 as well as level 3). At each rating level, programs must meet quality standards in a different aspect of program quality, including basic health and safety (level 1), education and qualifications (level 2), curriculum and assessment (level 3), and environment and interactions (levels 4 and 5).

ANALYSIS METHODS

The following describes the data sources and analysis methods we used to address each research question for the outcome study.

RESEARCH QUESTION 1:

What are the language, literacy, numeracy, and self-regulation outcomes of children who attended programs that participated in the Mixed Delivery Preschool Pilot Program and how do those outcomes compare to the outcomes achieved by students in public school VPI classrooms?

The analyses for Research Question 1 used child characteristics data and child assessment data collected for the evaluation, including the Woodcock Johnson III tests and the Head Toes Knees Shoulders assessment, and also PALS-PreK Literacy scores provided by the state.

For this evaluation, we collected child assessment data for the first cohort of grantees during their second year of grant implementation, to ensure that the mixed delivery initiative was fully implemented for the analysis. Child assessments were conducted in the fall and spring of the preschool year to measure child gains in early math, language, and literacy. Child outcomes were measured in the spring in order to have a consistent time point near the end of the program year; not all programs operated in the summer. We chose not to measure child outcomes in the fall of kindergarten because it would be impossible to attribute results to mixed delivery for children in programs that ended several months earlier.

We used the child assessment data collected for this evaluation to examine child outcomes in mixed delivery classrooms and also to compare those outcomes to similar children in public school VPI classrooms in the same communities and to performance guidelines from the assessment instrument publishers.

When examining child outcomes for a program such as mixed delivery preschool, the goal is to make "apple-to-apple" comparisons representing program outcomes for children with similar characteristics who did and did not participate in the program. Random assignment is the gold standard of research design for "apple-to-apple" comparisons, but this method is not always feasible or practical. When random assignment is not possible, such as in the mixed delivery evaluation, researchers can compare outcomes of children in the program with outcomes of similar children in an alternative program using statistical techniques to reduce the influence of any differences in child characteristics.

For this evaluation, we compared similar groups of children who attended mixed delivery classrooms and public school VPI classrooms in the same communities. We used propensity score matching to create similar groups of children for comparison between mixed delivery and public school VPI classrooms. We used data on fall assessment scores and child characteristic indicators (including being female, being white and non-Hispanic, if English is the primary language spoken at home, if the child has an IEP, if the mother or other primary guardian attended college, if the child had any prior child care or preschool, if the child previously attended a center-based program, and if an adult read to the child at home at least a few times per week) to generate a propensity score, and matched children in mixed delivery classrooms to children in public school VPI classrooms with similar propensity scores. The propensity score matching procedure created a matched group of 128 children, 64 in mixed delivery and 64 in public school VPI, from an initial sample of 240 children who participated in child assessments in the fall and spring. We then used ordinary least squares regression analysis to assess the relationship between mixed delivery participation and child devel-

opmental outcomes. The multiple regression analyses used cluster-robust standard errors to adjust for grouping of children in classrooms, a statistical technique that helps to account for similarities in children's experiences and other characteristics within each classroom, as these similarities can introduce bias in the analysis outcomes.

We also used scoring guidelines from the Woodcock Johnson III publisher to describe the percentage of children in both mixed delivery and public school VPI classrooms who met or exceeded typical scores for their age.

We used descriptive analysis methods with the PALS-PreK Literacy scores for children who attended Cohort 1 mixed delivery classrooms in the second year of implementation, to provide additional information about child developmental outcomes in these classrooms. The mixed delivery teachers conducted these assessments in fall and spring of the preschool year. We presented average fall and spring scores on the PALS-PreK Literacy instrument for children in mixed delivery classrooms, and we also used scoring guidelines from the instrument publishers to show how the average scores compare to scoring expectations for four-year-old children's literacy skills in the spring of their preschool year.

We did investigate the possibility of collecting kindergarten entry assessment data using the PALS-PreK instrument for children in the study, but the existing state data systems do not have the capacity to follow all children in the study from preschool to kindergarten.

RESEARCH QUESTION 2:

What is the relationship between teacher qualifications and child developmental outcomes among preschool children in mixed delivery and public school classrooms?

The analyses for Research Question 2 used several sources of data collected for the evaluation, including child characteristics data, classroom characteristics data on teacher qualifications, and child assessment data including the Woodcock Johnson III tests and the Head Toes Knees Shoulders assessment.

We examined the relationship between teacher qualifications and child outcomes, using self-reported classroom characteristics data on whether or not the lead teacher had a bachelor's degree and whether or not the lead teacher had a child development associate credential. For the analysis, we used the propensity-score matched sample of children that was used with the analyses for research question 1. We conducted multiple regression analyses that examined the relationship between each teacher qualification and child outcomes, controlling for the teacher's years of classroom experience and child characteristics including being female, being white and non-Hispanic, if English is the primary language spoken at home, if the child has an IEP, if the mother or other primary guardian attended college, if the child had any prior child care or preschool, if the child previously attended a center-based program, and if an adult read to the child at home at least a few times per week. The analyses did not control for mixed delivery versus public school VPI participation because all children in the public school VPI classrooms had a teacher with at least a bachelor's degree, so the mixed delivery indicator was redundant and could not be included. The multiple regression analyses used cluster-robust standard errors to adjust for grouping of children in classrooms.

RESEARCH QUESTION 3:

What are the program quality and teaching practice outcomes for programs participating in the Mixed Delivery Preschool Pilot Program?

The analyses for Research Question 3 used a survey of teaching practices that we collected for the evaluation from teachers in mixed delivery and public school VPI classrooms, and also existing Virginia Quality data provided by the state for mixed delivery programs.

For the survey of teaching practices, we conducted a descriptive analysis, using frequencies or percentages to describe responses of teachers in mixed delivery and public school VPI classrooms. Although we had a fairly high survey response rate (73%), the sample size of teacher respondents was small. The survey had only 49 respondents in total, including 16 mixed delivery teachers and 33 public school VPI teachers. Because of the small sample size, even fairly large differences in response patterns were not statistically significant in some cases. For this reason, we do not report the statistical significance of any observed differences in responses between mixed delivery and public school VPI teachers.

We also conducted a descriptive analysis of the Virginia Quality data, using frequencies or percentages to describe the ratings of mixed delivery programs at two points in time.

IMPLEMENTATION STUDY METHODS

The implementation study draws from both quantitative and qualitative data to address Research Question 4: What were the experiences of grantees that implemented the Mixed Delivery Preschool Pilot Program?

The quantitative data include program characteristics and mixed delivery enrollment in the second year of the grant for all 10 grantees. The qualitative data include site visit data that included focus groups with grantee staff, mixed delivery program staff, and parents of children enrolled in mixed delivery slots, conducted with the five Cohort 1 grantees only in the first year of the grant. The qualitative data also include telephone interviews with grantee staff that were conducted in the second year of the grant for the five Cohort 1 grantees and the first year of the grant for the five Cohort 2 grantees. The study team conducted descriptive analyses of the quantitative data and telephone interview data, and an in-depth qualitative analysis of the focus group data.

The following describes the sample, data, measures, and analysis methods for each type of analysis included in the implementation study.

Analysis of Program Characteristics

For the implementation study, we examined the characteristics of programs that participated in the mixed delivery pilot initiative

Sample, data, and measures. The sample included all five Cohort 1 grantees and all five Cohort 2 grantees. The evaluation team asked each mixed delivery program to complete a brief survey form describing their program and teacher characteristics in both the first and second year of their grant (2016–17 and 2017–18 for Cohort 1 grantees and 2017–18 and 2018–19 for Cohort 2 grantees). The form asked programs to report about their hours and dates of operation (part-day, full-day, and extended-day; school year and calendar year), the number of children enrolled in the program overall and in different age groups, and the number of slots supported by different types of public funding (VPI, Head Start, child care subsidies, and other public funding). The form also asked programs to report on classroom characteristics for each classroom including enrollment by age, adult-child ratios, and teacher qualifications including

teacher role (lead teacher, co-teacher, or assistant/aide), teacher education level (degree earned), child development associate credential, and teacher coursework on child development.

Analysis methods. We conducted a descriptive analysis of the program characteristics data, examining means and standard deviations or frequencies and percentages as appropriate for each measure.

Analysis of Mixed Delivery Enrollment

We used descriptive statistics to analyze enrollment in publicly funded preschool slots in private programs in the grantee communities during the mixed delivery grant period, using enrollment data reported by grantees.

Sample, data, and measures. The enrollment data include counts of children enrolled in publicly funded slots in private programs participating in the mixed delivery grant, as well as any other publicly funded slots in programs that the grantees were aware of in their local communities. The data were gathered by grantees for the purpose of grant reporting to VECF. VECF provided the data from each of the 10 grantees to the evaluation team.

Analysis methods. To analyze the enrollment data, the evaluation team combined the annual enrollment count data from each grantee and summarized the data for each year using frequencies.

Analysis of Site Visit Data

For the implementation study, we conducted a qualitative analysis of the focus group data collected during site visits to Cohort 1 grantees.

Sample, data, and measures. The site visit data include the five Cohort 1 grantees only. Site visits were conducted by SRC evaluation team members in spring of 2017, and included focus groups with grantee agency staff (including employees of the grantee agency and employees of non-preschool partner agencies that support implementation of the grant), mixed delivery preschool program staff (including preschool program administrators and classroom teaching staff), and family members of children enrolled in mixed delivery slots (including parents and guardians) in each of the five grantee communities. Across all five grantees, a total of 31 grantee staff members, 20 mixed delivery preschool program staff members, and 36 family members participated in the focus groups. The grantee staff and program staff that participated in focus groups were identified as key mixed delivery staff by the grantee agency point of contact for the study, and participation was voluntary. The families who participated in the focus groups were invited to participate by mixed delivery program staff, and their participation was also voluntary.

Analysis methods. To analyze the focus group data, SRC used a directed content analysis approach (Hsieh & Shannon, 2005), in which the researchers analyzed each source of qualitative data using a thematic coding scheme based on a theory of change that was developed for the evaluation. For the coding process, the thematic codes were applied directly to transcriptions of the focus group data. After coding was completed, the researchers retrieved all data that had been flagged with a specific code in order to conduct a comprehensive analysis within each thematic code. SRC's study team members who participated in the qualitative data collection, and who have experience with qualitative research, conducted the qualitative coding and analysis for the study.

Analysis of Report Data

For the implementation study, we conducted a qualitative analysis of mid-year and end-of-year data submitted from both Cohort 1 and Cohort 2 grantees.

Sample, data, and measures. The report data include mid-year and end-of-year reports submitted by all 10 mixed delivery grantees, including five Cohort 1 grantees and five Cohort 2 grantees. Reports were submitted to VECF by each grantee twice a year (January and June). The team focused on every grantee's first end-of-year report as well as the grantee's most recent submission. For Cohort 1, this amounted to a review of two end-of year reports. For Cohort 2, this entailed a review of grantees' first end-of-year report and their second mid-year report.

Analysis methods. To analyze the report data, SRC used a grounded analysis approach (Charmaz, 2006). The reports were first reviewed via focused coding, with an eye for implementation successes and sustainability. After this process, the flagged data were reviewed, and the evaluation team met to discuss emerging codes and how codes related to one another. The team later defined five categories that subsets of codes represented: (1) governance and decision making, (2) partnership and collaboration, (3) systems building, (4) funding, and (5) change levers. SRC's study team members who participated in the qualitative data collection, and who have experience with qualitative research, conducted the qualitative coding and analysis for the study.

Analysis of Telephone Interview Data

For the implementation study, we conducted a qualitative analysis of the telephone interview data collected from both Cohort 1 and Cohort 2 grantees.

Sample, data, and measures. The telephone interview data include all 10 mixed delivery grantees, including five Cohort 1 grantees and five Cohort 2 grantees. The telephone interviews were conducted by SRC evaluation team members in the spring of 2018, which was the end of the second year of the grant for Cohort 1 grantees and the end of the first year of the grant for Cohort 2 grantees. The telephone interviews were conducted with one or more grantee agency staff members, identified by the evaluation's main point of contact at each grantee agency. Participation in telephone interviews was voluntary.

Analysis methods. To analyze the telephone interview data, SRC used a directed content analysis approach (Hsieh & Shannon, 2005), in which the researchers analyzed each source of qualitative data using a thematic coding scheme that was developed from the report review. For the coding process, the thematic codes were applied directly to transcriptions of the telephone interview data. After coding was completed, the researchers retrieved all data that had been flagged with a specific code in order to conduct a comprehensive analysis within each thematic code. SRC's study team members who participated in the qualitative data collection, and who have experience with qualitative research, conducted the qualitative coding and analysis for the study.

APPENDIX B: DETAILED RESULTS

Appendix B includes detailed results and tables for the implementation and outcome study analyses.

IMPLEMENTATION OF THE MIXED DELIVERY INITIATIVE

TABLE B1: Characteristics of Mixed Delivery Programs and Classrooms in Cohort 1 and Cohort 2 Grantee Sites

Program Characteristics	Cohort 1	Cohort 2
Service Delivery Setting		
CBO	100%	67%
FCC	-	33%
Schedule		
Full year	78%	100%
School year	22%	-
Part day	11%	24%
Full day	67%	57%
Extended day	44%	67%
Age of Children		
Under three	56%	43%
Three	78%	76%
Four	78%	95%
Five	11%	48%
Funding Approach		
VPI	78%	-
Head Start	33%	5%
Child Subsidy	56%	84%
Other	66%	20%

Note: CBO = community-based organization; FCC = family child care

Classroom Characteristics	Cohort 1	Cohort 2
Lead Teacher Education		
HS diploma or GED	11%	11%
Some college	26%	23%
Associate's degree	-	33%
Bachelor's degree	42%	33%
Master's or other graduate degree	21%	-
Teacher Qualifications		
Coursework in ECE	79%	67%
CDA credential	26%	22%

Note: HS = high school; ECE = early childhood education; CDA credential = child development associate credential

TABLE B2: Percentage of Pre-K Pupils in Private Settings Before, During, and After Mixed Delivery Initiative

	2015-16	2016-17	2017-18	2018-19
Cohort 1 2016–18	2.4%	6.1%	7.1%	5.9%
Cohort 2 2017–19	-	12.5%	13.3%	14.1%

TABLE B3: Site Visit–Focus Group Composition

Focus Group Type	Number of Participants	Roles
Partnership Administrator	31	Grantee agency staff and community partner staff
Private Program Staff	20	Program directors, teachers, and support staff
Family Member	36	Family members including parents and grandparents

TABLE B4: Interview Composition

Cohort	Number of Participants	Roles
Cohort 1	6	Grantee agency staff
Cohort 2	10	Grantee agency staff

TABLE B5: PALS-PreK Literacy Scores in Mixed Delivery Classrooms in Cohort 1 Communities

Program Characteristics	Fall Pretest	Spring Outcome	Developmental Range	Maximum Score
TEST	M	M		
Name Writing				
Cohort 1 2016–17 (n=54)	4.37	6.06	5-7	7
Cohort 1 2017–18 (n=94)	4.06	6.16	5-7	7
Alphabet Upper				
Cohort 1 2016–17 (n=54)	9.36	18.31	12-21	26
Cohort 1 2017–18 (n=94)	11.15	18.62	12-21	26
Beginning Sound				
Cohort 1 2016–17 (n=54)	5.24	7.82	5-8	10
Cohort 1 2017–18 (n=94)	4.59	8.48	5-8	10
Print Word				
Cohort 1 2016–17 (n=54)	6.12	8.00	7-9	10
Cohort 1 2017–18 (n=94)	5.44	8.43	7-9	10
Rhyme Awareness				
Cohort 1 2016–17 (n=54)	5.66	7.62	5-7	10
Cohort 1 2017-2018 (n=94)	5.02	7.73	5-7	10
Nursery Rhyme Awareness				
Cohort 1 2016-2017 (n=54)	5.25	7.98	6-10	10
Cohort 1 2017-2018 (n=94)	5.91	8.65	6-10	10

Note: PALS-PreK provides developmental score ranges, designed for use in the spring of the four-year old-year. These ranges represent a range of development associated with later reading success and provide a frame of reference for setting expectations for curriculum development and instructional pacing.

TABLE B6: PALS-PreK Literacy Scores in Mixed Delivery Classrooms in Cohort 2 Communities

Program Characteristics	Fall Pretest	Spring Outcome	Developmental Range	Maximum Score
TEST	M	M		
Name Writing				
Cohort 1 2017–18 (n=94)	4.25	5.47	5-7	7
Alphabet Upper				
Cohort 1 2017–18 (n=94)	10.58	15.98	12-21	26
Beginning Sound				
Cohort 1 2017–18 (n=94)	5.14	7.84	5-8	10
Print Word				
Cohort 1 2017–18 (n=94)	4.88	6.60	7-9	10
Rhyme Awareness				
Cohort 1 2017–18 (n=94)	5.44	7.46	5-7	10
Nursery Rhyme Awareness				
Cohort 1 2017–18 (n=94)	3.49	5.78	6-10	10

Note: PALS-PreK provides developmental score ranges, designed for use in the spring of the four-year old-year. These ranges represent a range of development associated with later reading success and provide a frame of reference for setting expectations for curriculum development and instructional pacing.

TABLE B7: Unmatched and Matched Descriptive Statistics for All, Mixed Delivery, and Public School Children's Baseline Data (Fall Pretest Scores)

UNMATCHED SAMPLES					
	All Children (n=229)	Mixed Delivery (n=83)	Public School (n=146)		
Child Characteristics	%	%	%	Chi square p-value	Std diff
White Non-Hispanic	37%	30%	40%	.12	.22
Female	54%	55%	53%	.77	-.04
English at Home	21%	14%	25%	.03*	.27
No Prior Care	42%	29%	50%	.00*	.43
Center-based Care	38%	49%	32%	.01*	-.37
IEP	4%	2%	5%	.37	.13
No College	46%	45%	47%	.77	.04
Reading at Home	72%	80%	68%	.06	-.27

Note: * p < .05

	All Children (n=229)		Mixed Delivery (n=83)		Public School (n=146)			
Pretest scores	M	SD	M	SD	M	SD	T test p value	Std diff
WJ Letter Word	7.03	4.83	7.54	4.22	6.74	5.14	.23	-.17
WJ Applied Problems	7.06	3.22	7.37	3.31	6.88	3.17	.27	-.15
WJ Picture Vocabulary	14.20	3.77	14.19	3.89	14.21	3.71	.98	.00
HTKS	7.88	13.94	8.17	13.62	7.71	14.17	.82	-.03

Note: WJ Letter Word = Woodcock Johnson Letter Word Identification; WJ Applied Problems = Woodcock Johnson Applied Problems; WJ Picture Vocabulary= Woodcock Johnson Picture Vocabulary; HTKS = Head Toes Knees Shoulder; White, Non-Hispanic = child is white, non-Hispanic; Female = child is female; IEP = child had an IEP in fall of preschool year; English at Home = English was the dominant language at home in fall of preschool year; No Prev. Childcare = child had no previous child care, fall of pre-school year; Center-based care = child attended center-based care prior to fall of preschool year; No College = mother or primary caregiver did not attend college; Reading at Home = a family member reads to child at least a few times a week

MATCHED SAMPLES					
	All Children (n=128)	Mixed Delivery (n=64)	Public School (n=64)		
Child Characteristics	%	%	%	Chi square p-value	Std diff
White Non-Hispanic	34%	38%	31%	.46	-.13
Female	57%	55%	59%	.59	.09
English at Home	17%	16%	19%	.64	.08
No Prior Care	37%	38%	36%	.85	-.03
Center-based Care	45%	47%	44%	.72	-.06
IEP	4%	3%	5%	.65	.08
No College	51%	50%	52%	.86	.03
Reading at Home	80%	77%	83%	.38	.15

Pretest scores	M	SD	M	SD	M	SD	T test p value	Std diff
WJ Letter Word	6.57	3.81	6.61	3.73	6.53	3.92	.91	-.02
WJ Applied Problems	7.13	3.17	7.16	3.30	7.09	3.07	.91	-.02
WJ Picture Vocabulary	14.17	3.70	14.06	3.81	14.28	3.62	.74	.06
HTKS	8.16	14.09	8.61	14.00	7.72	14.27	.72	-.06

Note: WJ Letter Word = Woodcock Johnson Letter Word Identification; WJ Applied Problems = Woodcock Johnson Applied Problems; WJ Picture Vocabulary= Woodcock Johnson Picture Vocabulary; HTKS = Head Toes Knees Shoulder; White, Non-Hispanic = child is white, non-Hispanic; Female = child is female; IEP = child had an IEP in fall of preschool year; English at Home = English was the dominant language at home in fall of preschool year; No Prev. Childcare = child had no previous child care, fall of preschool year; Center-based care = child attended center-based care prior to fall of preschool year; No College = mother or primary caregiver did not attend college; Reading at Home = a family member reads to child at least a few times a week

TABLE B8: Descriptive Statistics for All, Mixed Delivery, and Public School Children's Spring Woodcock Johnson Proficiency Levels

Variable	All Children (n=128)	Mixed Delivery (n=64)	Public School (n=64)	
Test Scores	%	%	%	Chi square p-value
Letter Word Identification				.99
Severely Delayed	4.69%	4.69%	4.69%	
Moderately Delayed	4.69%	3.13%	6.25%	
Mildly Delayed	15.63%	17.19%	14.06%	
Mildly Delayed to Age Appropriate	6.25%	6.25%	6.25%	
Age Appropriate	25.00%	25.00%	25.00%	
Age Appropriate to Advanced	9.38%	10.94%	7.81%	
Advanced	27.34%	26.56%	28.13%	
Very Advanced	7.03%	6.25%	7.81%	
Children who Met or Exceeded Typical Scores for Age Group	68.75%	68.75%	68.75%	
Applied Problems				.29
Severely Delayed	1.56%	3.13%	0	
Moderately Delayed	.78%	0%	1.56%	
Mildly Delayed	7.03%	3.13%	10.94%	
Mildly Delayed to Age Appropriate	20.31%	18.75%	21.88%	
Age Appropriate	31.25%	32.81%	29.69%	
Age Appropriate to Advanced	13.28%	17.19%	9.38%	
Advanced	25.00%	25.00%	25.00%	
Very Advanced	.78%	0%	1.56%	
Children who Met or Exceeded Typical Scores for Age Group	70.31%	75%	65.63%	

Variable	All Children (n=128)	Mixed Delivery (n=64)	Public School (n=64)	
Test Scores	%	%	%	Chi square p-value
Picture Vocabulary				.47
Severely Delayed	0%	0%	0%	
Moderately Delayed	1.56%	1.56%	1.56%	
Mildly Delayed	14.06%	18.75%	9.38%	
Mildly Delayed to Age Appropriate	8.59%	7.81%	9.38%	
Age Appropriate	40.63%	39.06%	42.19%	
Age Appropriate to Advanced	17.19%	12.50%	21.88%	
Advanced	17.19%	20.31%	14.06%	
Very Advanced	.78%	0%	1.56%	
Children who Met or Exceeded Typical Scores for Age Group	75.59%	71.43%	79.69%	

TABLE B9: Comparison of All, Mixed Delivery, and Public School Children's Spring Woodcock Johnson Scores to Normed Sample

MATCHED SAMPLES								NORMED SAMPLES			
Variable	All Children (n=128)		Mixed Delivery (n=83)		Public School (n=146)			Age Four		Age Five	
Test scores	M	SD	M	SD	M	SD	p-value	M	SD	M	SD
WJ Letter Word	347.76	24.29	344.61	21.67	350.90	26.82	.22	331.59	29.58	357.89	33.93
WJ Applied Problems	416.38	15.52	415.05	16.39	417.70	14.60	.48	399.20	25.57	415.59	24.18
WJ Picture Vocabulary	468.96	14.08	467.19	14.51	470.73	13.53	.23	460.26	17.93	468.24	16.65

Note: Some children had turned five by the time they completed a spring assessment; thus, we included the mean score for both ages four and five from the Normed Sample. McGrew, K. S., Schrank, F. A., & Woodcock, R. W. (2007). Technical Manual. Woodcock- Johnson III Normative Update. Rolling Meadows, IL: Riverside Publishing. WJ Letter Word = Woodcock Johnson Letter Word Identification; WJ Applied Problems = Woodcock Johnson Applied Problems; WJ Picture Vocabulary= Woodcock Johnson Picture Vocabulary; HTKS = Head Toes Knees Shoulders

TABLE B10: Descriptive Statistics of All, Mixed Delivery, and Public School Children's Spring Head Toes Knees Shoulders Scores

MATCHED SAMPLES							
	All Children (n=128)		Mixed Delivery (n=64)		Public School (n=64)		
Test scores	M	SD	M	SD	M	SD	p-value
HTKS	19.66	19.92	20.72	20.01	18.61	19.93	.60

TABLE B11: Summary of Multiple Regression for Fall Scores Predicting Spring Child Literacy, Language, Numeracy, and Self-Regulation Outcomes (n=128)

Child Outcomes	Predictors	B	SE B	t
Model 1 WJ Letter Word	Fall WJ Letter Word	-6.30	5.06	-1.24
Model 2 WJ Applied Problems	Fall WJ Applied Problems	-2.66	3.74	-0.71
Model 3 WJ Picture Vocabulary	Fall WJ Picture Vocabulary	-3.55	2.92	-1.22
Model 4 HTKS	Fall HTKS	2.11	3.95	0.53

Note: WJ Letter Word = Woodcock Johnson Letter Word Identification; WJ Applied Problems = Woodcock Johnson Applied Problems; WJ Picture Vocabulary= Woodcock Johnson Picture Vocabulary; HTKS = Head Toes Knees Shoulders; Fall WJ Letter Word = WJ Letter Word Identification raw score, fall of preschool year; Fall WJ Applied Problems = WJ Applied Problems raw score, fall of preschool year; Fall WJ Picture Vocabulary = WJ Picture Vocabulary raw score, fall of preschool year. We do not include child characteristic variables because they were accounted for during the propensity score match process that resulted in 128 children in the sample.

Model 1 $F(10, 31) = 1.55$ Model 2 $F(10, 31) = .51$ Model 3 $F(10, 31) = 1.48$ Model 4 $F(10, 31) = .29$. None of the models are significant.

TABLE B12: Matched Sample Descriptive Statistics for Teacher's BA Status and Children's Baseline and Outcome Data

	FALL PRETEST				SPRING OUTCOME			
	Teacher with BA (n=104)		Teacher without BA (n=24)		Teacher with BA (n=104)		Teacher without BA (n=24)	
Variable	M	SD	M	SD	M	SD	M	SD
WJ Letter Word	316.32	23.72	320.38	19.39	346.96	17.34	351.21	11.92
WJ Applied Problems	393.18	20.94	404.08	18.58	416.16	8.86	417.29	9.45
WJ Picture Vocabulary	464.33	10.57	459.04	14.61	469.57	10.57	466.33	10.82
HTKS	8.67	14.91	5.96	9.72	19.33	12.89	21.13	10.60

Note: BA = Bachelor of Arts degree; WJ Letter Word = Woodcock Johnson Letter Word Identification; WJ Applied Problems = Woodcock Johnson Applied Problems; WJ Picture Vocabulary = Woodcock Johnson Picture Vocabulary; HTKS = Head Toes Knees Shoulders

TABLE B13: Matched Sample Descriptive Statistics for Teacher's CDA Status and Children's Baseline and Outcome Data

	FALL PRETEST				SPRING OUTCOME			
	Teacher with CDA (n=27)		Teacher without CDA (n=101)		Teacher with CDA (n=27)		Teacher without CDA (n=101)	
Variable	M	SD	M	SD	M	SD	M	SD
WJ Letter Word	320.30	19.14	316.22	23.89	351.48	11.77	346.76	19.39
WJ Applied Problems	404.63	17.57	397.86	21.16	418.37	8.52	415.84	9.03
WJ Picture Vocabulary	457.63	15.81	464.86	13.19	465.81	11.81	469.80	10.22
HTKS	5.15	9.26	8.97	15.05	22.63	9.13	18.87	13.14

Note: CDA = Child Development Associate; WJ Letter Word = Woodcock Johnson Letter Word Identification; WJ Applied Problems = Woodcock Johnson Applied Problems; WJ Picture Vocabulary = Woodcock Johnson Picture Vocabulary; HTKS = Head Toes Knees Shoulders

TABLE B14: Summary of Multiple Regression for Teacher Qualification Variables Predicting Child Literacy, Language, Numeracy, and Self-Regulation Outcomes (n=128)

Child Outcomes	Predictors	B	SE B	t
Model 1 WJ Letter Word	Fall WJ Letter Word	0.65	0.09	6.75
	Bachelor's degree	-0.63	3.52	-0.18
	CDA	2.32	2.79	0.83
	YOE	0.35*	0.16	2.25
	White, non-Hispanic	8.62	3.32	2.6
	Reading at home	-7.51	3.72	-2.02
	Female	5.90	2.80	2.11
	IEP	-9.94	4.01	-2.48
	English at home	3.82	5.08	0.75
	No prior child care	-3.47	5.89	-0.59
	Center-based care	-0.85	6.13	-0.14
	No college	-4.21	3.76	-1.12
Model 2 WJ Applied Problems	Fall WJ Applied Problems	0.29	0.06	4.73
	Bachelor's degree	7.49	2.71	2.76
	CDA	6.56**	2.27	2.88
	YOE	-0.06**	0.11	-0.56
	White, non-Hispanic	8.53	2.79	3.06
	Reading at home	-2.25	2.45	-0.92
	Female	1.04	2.24	0.47
	IEP	-8.27	4.45	-1.86
	English at home	-2.52	3.94	-0.64
	No prior child care	-1.76	3.30	-0.53
	Center-based care	4.20	3.28	1.28
	No college	-1.02	2.66	-0.38

Note: WJ Letter Word = Woodcock Johnson Letter Word Identification; WJ Applied Problems = Woodcock Johnson Applied Problems; Fall WJ Letter Word = WJ Letter Word Identification raw score, fall of preschool year; Fall WJ Applied Problems = WJ Applied Problems raw score, fall of preschool year; fall of preschool year; Bachelor's degree = lead teacher has a bachelor's degree or higher; CDA = lead teacher has a CDA; YOE = lead teacher's years of classroom experience; White, non-Hispanic = child is white, non-Hispanic; Reading at home = a family member reads to child at least a few times a week; Female = child is female; IEP = child had an IEP in fall of preschool year; English at home = English was the dominant language at home in fall of preschool year; No prior child care = child had no previous child care, fall of preschool year; Center-based care = child attended center-based care prior to fall of preschool year; No college = mother or primary caregiver did not attend college.

Model 1 $F(10, 31) = 12.15$ Model 2 $F(10, 31) = 11.29$ Model 3 $F(10, 31) = 21.68$ Model 4 $F(10, 31) = 17.20$

* $p < .05$. ** $p \leq .01$

Child Outcomes	Predictors	B	SE B	t
Model 3 WJ Picture Vocabulary	Fall WJ Picture Vocabulary	0.67	0.09	7.17
	Bachelor's degree	1.93	1.63	1.18
	CDA	2.56	1.82	1.41
	YOE	0.11	0.09	1.17
	White, non-Hispanic	1.85	1.71	1.09
	Reading at home	-3.20	2.67	-1.2
	Female	0.15	2.00	0.08
	IEP	-4.74	4.81	-0.99
	English at home	-6.18*	3.02	-2.05
	No prior child care	-2.17	2.09	-1.04
	Center-based care	0.44	2.59	0.17
	No college	0.98	1.92	0.51
Mode 4 HTKS	Fall HTKS	0.78	0.09	8.67
	Bachelor's degree	10.17	10.00	1.02
	CDA	14.73	9.43	1.56
	YOE	-0.21	0.13	-1.66
	White, non-Hispanic	2.89	3.28	0.88
	Reading at home	1.33	4.23	0.32
	Female	0.59	3.41	0.17
	IEP	-2.90	7.59	-0.38
	English at home	-9.26*	3.61	-2.57
	No prior child care	-6.69	4.65	-1.44
	Center-based care	-4.98	5.30	-0.94
	No college	2.39	3.41	0.7

Note: WJ Picture Vocabulary= Woodcock Johnson Picture Vocabulary; HTKS = Head Toes Knees Shoulders; Fall WJ Picture Vocabulary = WJ Picture Vocabulary raw score, fall of preschool year; Bachelor's degree = lead teacher has a bachelor's degree or higher; CDA = lead teacher has a CDA; YOE = lead teacher's years of classroom experience; White, non-Hispanic = child is white, non-Hispanic; Reading at home = a family member reads to child at least a few times a week; Female = child is female; IEP = child had an IEP in fall of preschool year; English at home = English was the dominant language at home in fall of preschool year; No prior child care = child had no previous child care, fall of preschool year; Center-based care = child attended center-based care prior to fall of preschool year; No college = mother or primary caregiver did not attend college.

Model 1 $F(10, 31) = 12.15$ Model 2 $F(10, 31) = 11.29$ Model 3 $F(10, 31) = 21.68$ Model 4 $F(10, 31) = 17.20$

* $p < .05$. ** $p \leq .01$

TABLE B15: Descriptive Statistics for QRIS Ratings for Grantee Communities

	February 2018	October 2018	February 2019
Level 1	44%	22%	0%
Level 2	22%	33%	56%
Level 3	22%	33%	33%
Level 4	11%	11%	11%
Level 5	0%	0%	0%

TABLE B16: Percentage of Mixed Delivery and Public School VPI Teachers Reporting Responsive Teaching Practices, Spring 2018

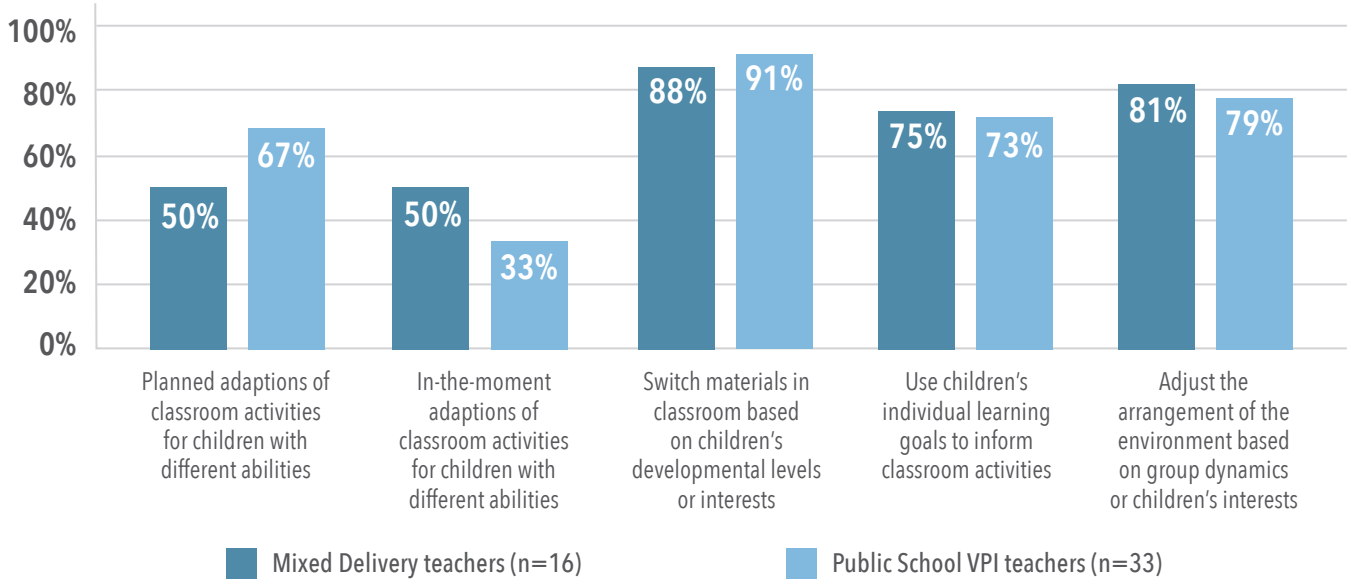


FIGURE B17: Percentage of Mixed Delivery and Public School VPI Teachers Using Curriculum and Activity Strategies, Spring 2018

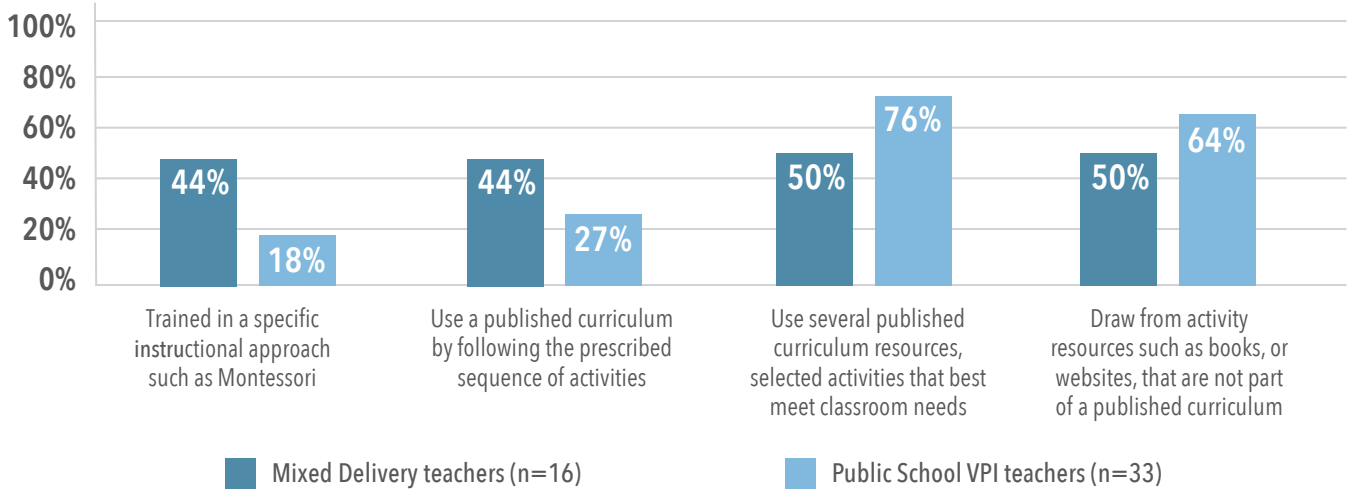


FIGURE B18: Percentage of Classroom Time Spent on Activity Types by Mixed Delivery and Public School VPI Teachers, Spring 2018

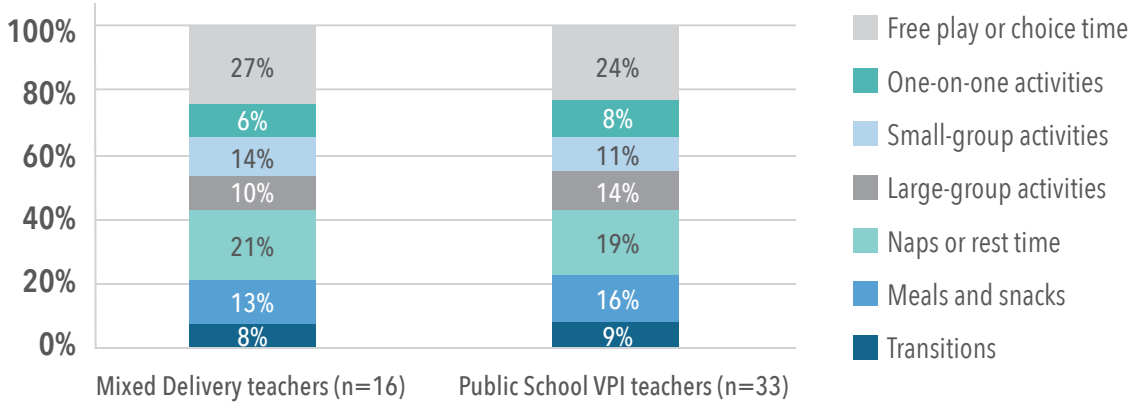


FIGURE B19: Percentage of Classroom Time Spent on Topics by Mixed Delivery and Public School VPI Teachers, Spring 2018

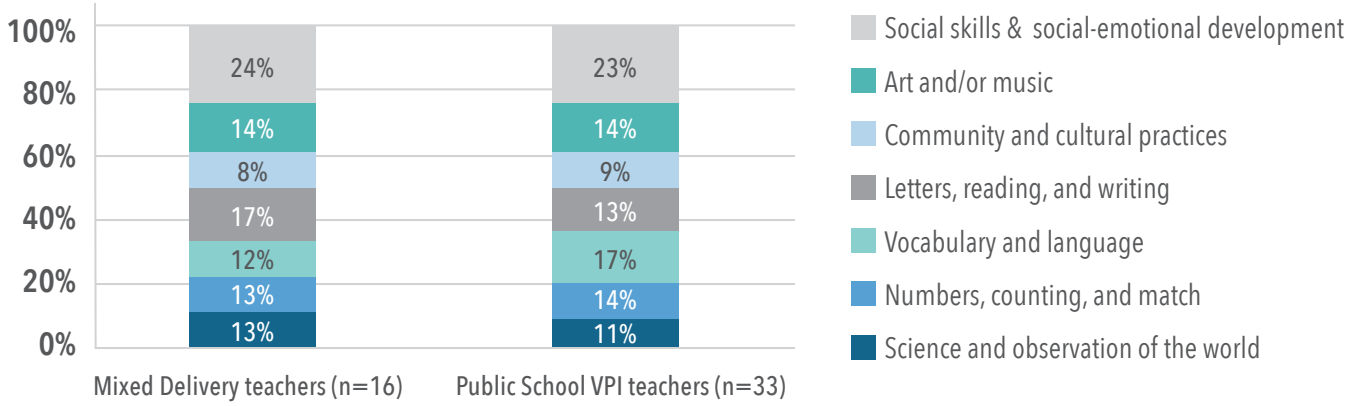


FIGURE B20: Percentage of Mixed Delivery and Public School VPI Teachers Using Strategies for Positive Relationships with Families of Different Backgrounds, Spring 2018

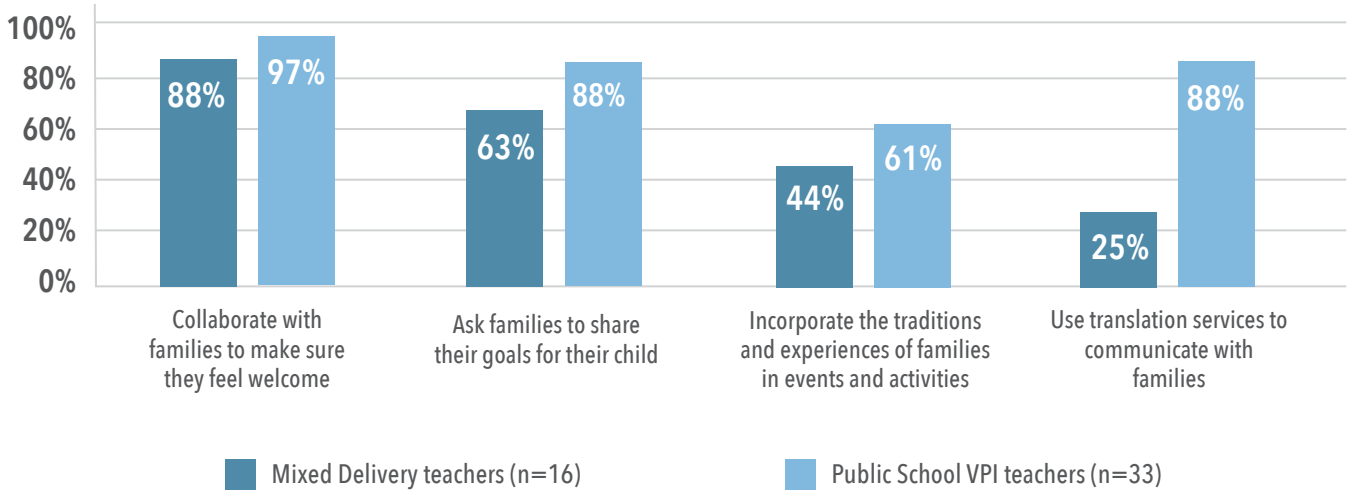
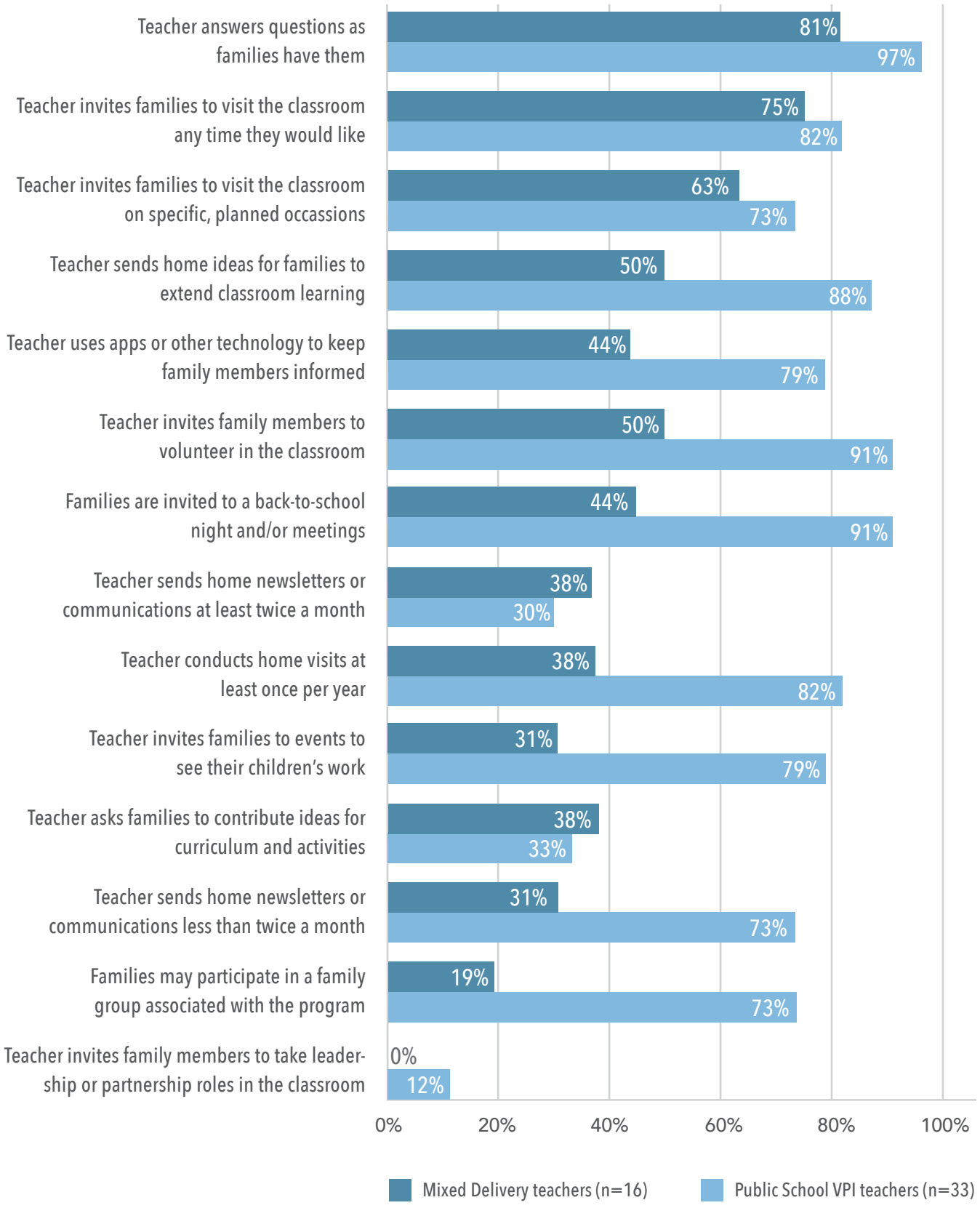


FIGURE B21: Percentage of Mixed Delivery and Public School VPI Teachers Using Approaches to Sharing Information About the Curriculum and Classroom Activities with Families, Spring 2018



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