Understanding the Workforce of the South Carolina Child Early Reading and Development Education Program

Teacher Education Requirements and Professional Development Opportunities

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Preface

The South Carolina Child Early Reading Development and Education Program (CERDEP) is a state-funded full-day four-year-old prekindergarten (4K) program for children at risk of not being ready to start kindergarten. Eligible children include those who live in districts with a score of 70 percent or higher on the state poverty index and whose family income is at or below 185 percent of the federal poverty guidelines or those eligible for Medicaid. The program is implemented using a mixed-delivery system, with both public school districts and licensed private center–based providers able to serve eligible children. In the 2017–2018 school year, the program funded about 11,700 children, with more than 80 percent of children attending classrooms in public schools.

As part of an ongoing commitment by the South Carolina legislature to evaluate aspects of CERDEP, the South Carolina Education Oversight Committee (EOC) contracted with the RAND Corporation to address questions related to per-pupil costs, teacher education, and teacher professional development. The focus of this report is the second and third topics: teacher education and professional development. We address two sets of research questions. First, we explore the distribution of teacher education levels and examine the relationship between teacher education levels and child outcomes. The study questions include:

- What was the distribution of education levels among CERDEP teachers in the 2017–2018 school year?

- Among children who attended private CERDEP providers in the 2017–2018 school year, what were the language and literacy outcomes of children in providers where all teachers had a bachelor's degree (BA), compared with children who attended providers where some or no teachers had a BA?

Through the second set of study questions, we document the in-service professional development opportunities available to CERDEP teachers in the 2017–2018 school year. The questions include:

- What professional development opportunities were offered to CERDEP educators, including lead teachers and instructional assistants, in the 2017–2018 school year? How frequently were the activities offered (e.g., on a rolling basis, as needed, annually)? In which opportunities did educators participate? What content was offered and how were the trainings delivered?
- To what extent did professional development activities differ between public school districts and private CERDEP providers? To what extent did activities or opportunities vary within public or private CERDEP providers?

- What systems are used to track the teacher professional development opportunities available to CERDEP providers?

A companion report on per-pupil costs for the CERDEP program is also available (see Lynn A. Karoly and Celia J. Gomez, *Cost Analysis of the South Carolina Child Early Reading and Development Education Program*, Santa Monica, Calif.: RAND Corporation, RR-2906, 2019).

This study should be of interest to the policymakers and practitioners associated with CERDEP, as well as those interested more generally in credentials and professional development for the early care and education workforce.

This study was undertaken by RAND Education and Labor, a division of the RAND Corporation that conducts research on early childhood through postsecondary education programs, workforce development, and programs and policies affecting workers, entrepreneurship, and financial literacy and decisionmaking.

More information about RAND can be found at www.rand.org. Questions about this report should be directed to cgomez@rand.org, and questions about RAND Education and Labor should be directed to educationandlabor@rand.org.

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Summary

Teacher professional development is a key component in many early care and education (ECE) programs. Indeed, professional development is the primary mechanism through which ECE practitioners build and maintain the skills needed to be effective educators of young children. Professional development is often organized in two categories: (1) preservice activities, or the training educators receive before they enter the classroom; and (2) in-service activities, or the skill development opportunities educators have while they are employed by a provider and actively serving children. Both preservice and in-service opportunities are necessary to develop and retain a high-quality ECE workforce. In this report, we focus on understanding the preservice education requirements, as well as the in-service activities designed for the South Carolina Child Early Reading and Development Education Program (CERDEP) workforce.

CERDEP is a state-funded full-day four-year-old prekindergarten (4K) program for low-income children at risk of not being ready to start kindergarten. CERDEP is implemented using a mixed-delivery system, with both public school districts and licensed private center–based providers able to serve eligible children. Oversight of the public school district–based programs is provided by the South Carolina Department of Education (SCDE), while South Carolina First Steps to School Readiness (First Steps)—the statewide public-private partnership to increase school readiness—oversees implementation in private providers. In the 2017–2018 school year, CERDEP served approximately 11,700 children, most of whom—about 83 percent—attended a CERDEP classroom in a public school district. Like many other state-funded prekindergarten (preK) programs, CERDEP policies detail staff professional preparation and professional development requirements—including the level of education teachers must complete before entering the classroom, as well as the amount of professional development teachers must engage in while employed by a CERDEP provider. We explore both topics in the analyses presented in this report.

Teacher Education Levels: Study Questions and Methods

While there is overall agreement that being an ECE teacher involves complex, challenging work, the field has yet to reach a consensus regarding the minimum level of education required for educators who care for young children. The lack of agreement regarding the minimum education level for ECE teachers is evident in CERDEP policy, as the requirements for lead teacher qualifications differ across public school districts and private providers. In the public school districts, all lead teachers are required to have a bachelor's degree (BA); in the private settings, lead teachers are only required to have a two-year college degree (such as an associate degree [AA]). The teachers in private CERDEP programs who have an AA in ECE or a related

field are required to be enrolled in a four-year degree program and demonstrate that they are working toward earning a four-year college degree. These teachers are not required to be enrolled in a course at all times, but they must complete a four-year degree within four years of being hired by a CERDEP provider to remain a CERDEP teacher. In this study, we shed light on whether variations in children's learning outcomes in the CERDEP program are related to differences in their teachers' education levels. Specifically, we address the following questions:

- What was the distribution of education levels among CERDEP teachers in the 2017–2018 school year?

- Among children who attended private CERDEP providers in the 2017–2018 school year, what were the language and literacy outcomes of children in providers where all teachers had a BA, compared with children in providers where some or no teachers had a BA?

The second question focuses only on teachers and children in private CERDEP programs, because teachers may or may not have a BA in those settings.

To address these research questions, we gathered administrative data from SCDE and First Steps on CERDEP teachers' education levels and provider characteristics; and children's language and literacy outcomes from the 2017–2018 school year, as measured by the *Teaching Strategies® GOLD Birth Through 3rd Grade Assessment* (B3–GOLD) at the beginning and end of students' 4K year. Our analysis includes 61 school districts and the approximately 600 lead teachers within those districts, and 192 private providers and the approximately 200 lead teachers who were employed by and the approximately 2000 children enrolled within the private providers. Because the available data did not identify in which classrooms children were enrolled, we could not match children to their lead teachers, and thus could not compare children whose lead teachers had varying levels of education. Instead, to address the second question, we created a provider-level variable that measures the percentage of teachers in private centers who had a BA. We used statistical analysis to explore whether the children in private CERDEP programs who attended a center where all teachers had a BA were more likely to meet age-level expectations on the B3–GOLD as compared with children who attended centers where only some or no teachers had a BA.

The teacher education analyses and associated results have several important limitations. First, we were unable to match children with their lead teacher. Theory suggests that the mechanism through which teachers' education levels might be related to student outcomes is via direct teacher-child interactions. Our analysis cannot capture the hypothesized pathway between teacher education levels and children's learning, as we do not know which CERDEP classroom teachers were working with which CERDEP children. Second, the data and research design do not allow for a causal interpretation of the relationship between teacher education levels and child outcomes, making the analyses descriptive in nature.

In-Service Professional Development: Study Questions and Methods

In-service ECE professional development includes different activities and opportunities with various goals and intended outcomes for teachers. For example, teachers may attend a week-long conference or seminar that covers multiple topics and domains, or teachers may engage in such classroom- or school-based activities as coaching or mentoring from instructional leaders. CERDEP regulations require that all teachers receive 15 hours of in-service training annually. Currently, CERDEP's professional development data systems collect relatively limited information on the activities that teachers engage in. For example, there is no single comprehensive publicly available data source or repository detailing all of the professional development opportunities available to CERDEP teachers in both public school districts and private settings. To fill this gap, we reviewed records of available professional development opportunities across multiple sources to provide a descriptive picture of the opportunities CERDEP educators had access to in the 2017–2018 school year. Further, we explore variation in the professional opportunities offered to teachers in public and private settings. Specifically, we address the following questions:

- What professional development opportunities were offered to CERDEP educators, including lead teachers and instructional assistants, in the 2017–2018 school year? How frequently were the activities offered (e.g., on a rolling basis, as needed, annually)? In which opportunities did educators participate? What content was offered and how were the trainings delivered?
- To what extent did professional development activities differ between public school districts and private CERDEP providers? To what extent did activities or opportunities vary within public or private CERDEP providers?
- What systems are used to track the teacher professional development opportunities available to CERDEP providers?

To address these questions, we conducted key informant interviews with staff members at CERDEP-affiliated organizations and agencies—including SCDE Office of Early Learning and Literacy (OELL), First Steps, and the South Carolina Center for Child Care Career Development (CCCCD)—to better understand the professional development opportunities offered to CERDEP teachers. To gather additional factual information on the CERDEP program, we conducted a thorough document review of CERDEP policies and procedures, professional development descriptions, CERDEP annual reports, and other documents relevant to the program. We compiled information from the documents and key stakeholder interviews to provide an overview of CERDEP professional development.

The ideal data to address our questions regarding CERDEP professional development opportunities and participation would also include teacher-level records documenting the specific professional development activities they participated in, total hours of participation, and the content of each activity. However, these data were not available for the purposes of this study;

thus, this report does not provide specific figures on teacher participation or a comparison of the number or nature of professional development opportunities teachers across settings received.

Key Findings

Our findings are organized by the two main topics of the report—teacher education levels and in-service professional development—and summarized in the text box that follows.

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Key Findings

Teacher Education Levels and Child Outcomes

- Approximately 64 percent of teachers in private CERDEP providers had a BA or higher in the 2017–2018 school year. The remaining 36 percent of teachers, who reported having an AA, were required to be enrolled in a four-year college degree program.

- Seventy percent of children in private settings attended centers where some or all teachers had a BA, and approximately 94 percent of all CERDEP children, across public and private settings, were enrolled in a classroom with a BA-level teacher.

- There were no statistically significant differences in children's B3–GOLD language and literacy outcomes at the end of 4K when comparing children who attended private providers where all teachers had a BA with children who attended private centers where some or no teachers had a BA. Children who attended private providers where all teachers had a BA were equally as likely to meet or exceed age-level expectations on the B3–GOLD language and literacy assessments as children who attended private providers where only some or no teachers had a BA.

In-Service Teacher Professional Development Opportunities

- The professional development opportunities offered to private providers by First Steps and to public providers by OELL are largely delivered separately. First Steps and OELL do not collaborate at a systems level to uniformly offer joint or shared professional development opportunities for providers from the two different settings.

- Like most ECE settings, both OELL and First Steps offered a number of individual workshop-style trainings on a range of overlapping topics, including high-quality language and literacy practices, health and safety, child assessments, and parent engagement.

- Both OELL and First Steps include opportunities for teachers to receive coaching. However, the coaching models and dosage differed across the two settings.

- Teachers in both public and private settings had autonomy over how they completed the mandatory 15 hours of professional development; there was variability among all teachers' experiences. Due to the high level of local control that CERDEP public school districts had in administering district-specific trainings for their educators, there may have been more variation in the training and workshop experiences among teachers in public settings compared with teachers in private settings.

- The South Carolina CCCCD provides the primary system by which CERDEP teachers track their participation in professional development. The system does not currently function as a workforce registry.

- CERDEP's professional development offerings meet some, but not all of the best-regarded practices in ECE professional development.

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CERDEP Teacher Education Levels and Child Outcomes

To provide context for CERDEP's teacher education level policies, we reviewed the teacher education requirements of state-funded 4K programs in nine neighboring states. Indeed, South Carolina's varying credentialing requirements across private and public settings are fairly unique among the reviewed states. Although almost all of the 4K programs we reviewed were implemented with a mixed-delivery system, eight of the states reviewed had the same teacher educational requirement for all settings in which the preK programs were offered (according to National Institute for Early Education Research's [NIEER] report on state preK programs from the 2016–2017 school year). Virginia was the only other state where teachers in private settings had a lower degree requirement (a high school diploma) than teachers in public school settings (a BA).

Despite the fact that only an AA was required, most teachers working in private CERDEP providers had completed a four-year college degree. As detailed in Figure S.1, approximately two-thirds (64 percent) of teachers in private CERDEP providers had a BA or higher in the 2017–2018 school year. Most of these teachers had a BA only, with a small percentage (approximately 12 percent of the total) having earned a master's, doctoral, or professional degree. The remaining 36 percent of teachers met the CERDEP teacher education requirement

Figure S.1. Distribution of Lead Teacher Education Level for CERDEP Public School Districts and Private Providers
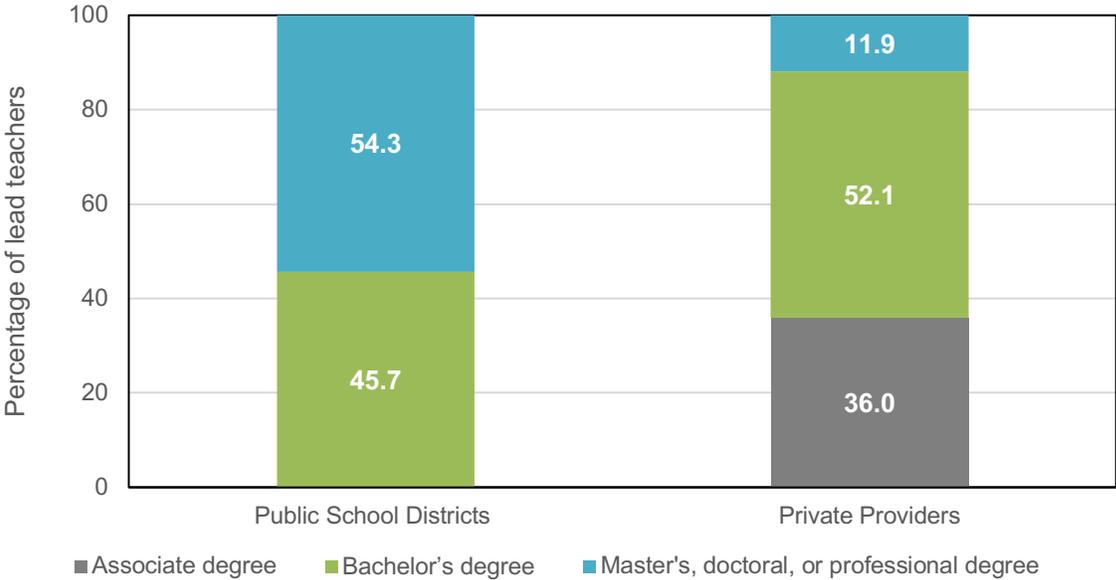
SOURCE: Public school district data as reported in SCDE (2018a); authors' analysis of First Steps administrative data (2017–2018).
NOTE: There are 211 CERDEP teachers working in private providers and 599 CERDEP teachers working in public school districts.

with an AA. By contrast, and by design, the distribution of teacher education levels in the public school districts looks somewhat different. One hundred percent of teachers in the public districts had a BA or higher, as dictated by program policy, with slightly over 50 percent of teachers having a master's, professional, or doctoral degree.

Because the available data did not allow us to match children to individual lead classroom teachers within private providers, we examined the percentage of CERDEP lead teachers with a BA or higher degree at each of the private providers. Specifically, we assigned private CERDEP providers to one of the three categories: (1) providers where all CERDEP teachers had a BA; (2) providers where some teachers had a BA; and (3) providers where no CERDEP teachers had a BA. The majority of CERDEP private providers (64 percent) and CERDEP children (70 percent) fell into the first two categories. For approximately 36 percent of private providers, no CERDEP teachers had a BA; 30 percent of CERDEP children attended these centers. While the remainder of our analyses focus on children who attended private CERDEP center-based providers only, it is important to note that a minority of all CERDEP children were served in private settings in the 2017–2018 school year (17 percent of approximately 11,700 children). Given that all children who attended CERDEP in public school districts were enrolled in a classroom with a BA-level teacher, approximately 94 percent of all CERDEP children across public and private settings were taught by a teacher with a BA.

We conducted descriptive and correlational statistical analyses to compare the end-of-year language and literacy outcomes of children in private CERDEP settings who attended centers in the three teacher education–level categories. Although we account for key child characteristics (e.g., children's scores at the start of the year, child age) and provider characteristics (e.g., measures of center quality), these analyses do not support a causal interpretation of the relationship we examined. The analysis is akin to comparing learning outcomes for children attending providers that were similar on all observed characteristics except for the share of teachers at the center with a BA. These comparisons showed no statistically significant differences in children's B3–GOLD language and literacy scores based on the share of teachers who had a BA, holding constant the set of child and provider characteristics. Thus, when comparing otherwise similar children in similar centers, children who attended centers where some or all teachers had a BA did not end their 4K year with stronger language or literacy skills than children who attended centers where no teachers had earned a BA.

In-Service Professional Development for CERDEP Teachers

CERDEP legislation requires that all teachers complete 15 hours of in-service professional development each school year. To frame our understanding of CERDEP's offerings, we reviewed the professional development requirement of state-funded 4K programs in nine other neighboring states. CERDEP's 15-hour-per-year requirement for lead teacher professional development is on par with many neighboring states, and CERDEP was one of only three state programs we reviewed that meets NIEER's staff professional development benchmark standard

(as reported in NIEER's annual report). To meet the quality standard, teachers in state preK programs must receive at least 15 hours of professional development per year, some of which must include individualize coaching, and all teachers must have a written, annual individualized professional development plan. However, as detailed further in the report, CERDEP's coaching services may not have reached all teachers. As a result, it is not clear that all teachers' professional development experiences in the 2017–2018 school year met the NIEER standards. In addition, South Carolina is one of only three states (among the ten we reviewed) without an ECE workforce registry to track teacher education, professional development offerings, and professional development participation in one comprehensive system.

Both SCDE and First Steps reported that in the 2017–2018 school year, 100 percent of CERDEP teachers met the 15-hour-per-year professional development requirement and received training under the domains required by CERDEP guidelines (e.g. child growth and development, teaching emergent literacy). For CERDEP teachers in public school districts, OELL was responsible for teachers' professional development and provided various professional learning opportunities (PLOs) to educators throughout the school year. Additionally, individual districts had the freedom to offer district-specific professional development for their staff. First Steps provided professional development opportunities for CERDEP teachers working in private providers. Based on our review, the professional development opportunities offered to public providers by OELL and to private providers by First Steps were largely separate. There were some opportunities for teachers from both public and private settings to receive professional development together; however, OELL and First Steps did not to collaborate on a systems level to offer joint professional development sessions.

Comparing Opportunities in Public School Districts and Private Settings

Teachers in public and private CERDEP settings had access to many different professional development opportunities to meet the 15-hour requirement. Our review of the available professional development opportunities focused on three different kinds of professional development activities that are common in ECE programs: (1) non-credit bearing workshops, (2) coaching or mentoring, and (3) credit-bearing coursework. In Table S.1, and in the following discussion, we summarize the available opportunities for teachers in public school districts and private settings.

Workshops. Our review indicated that, like most ECE settings, the majority of the professional opportunities offered to CERDEP teachers in private and public settings were non–credit bearing workshops. For example, First Steps organized a four-day academy for all 4K teachers at the start of the school year, with many different workshop-style trainings. Similarly, OELL organized many state and region workshops for teachers in public school districts. Both First Steps- and OELL-provided workshops focused on many different topics, such as educators' ability to implement high quality language and literacy practices, ECE curriculum, child assessments, South Carolina's Early Learning Standards, health and safety, and parent

Table S.1. Summary of Professional Development Offerings for Public and Private CERDEP Providers

Professional Development Features	Public School Districts	Private Providers
Primary organizations offering professional development	• OELL • Individual districts • State ECE conferences	• First Steps • State ECE conferences
Workshops and trainings	• Offered throughout the year on many topics	• Offered throughout the year on many topics
Coaching and mentoring	• Coaching offered; focused on the Early Language and Literacy Classroom Observation • OELL offered coaching once annually to some staff only • Access to school-based literacy coaches	• Coaching offered with BLOOM framework • First Steps offered twice monthly
Credit-bearing courses	• Not officially part of offerings	• Not officially part of offerings • An estimated 36 percent of all lead teachers (who only had an AA) were required to be working toward a four-year college degree

NOTE: BLOOM = Building Learner Outcomes Through Opportunities and Models.
SOURCE: Authors' analysis of CERDEP documents and key informant interviews.

engagement. However, due to lack of data on the specific content of these professional development offerings, it is not clear how comparable the content or delivery is across trainings for teachers in public and private settings.

Coaching and mentoring. Both public and private CERDEP providers had access to coaching and mentoring opportunities in the 2017–2018 school year. Staff from OELL and First Steps engaged in quality monitoring and coaching visits with public and private providers, respectively. In public settings, the OELL coaching visits were guided by a language and literacy classroom observation tool and focused on creating plans and goals to improve teachers' practice. The visits happened once annually, and not all classrooms received a visit each year. All public schools also employed literacy coaches who may have worked with CERDEP teachers on their classroom practice. In the private setting, First Steps regional coordinators used the BLOOM plan, a framework to guide the coaching sessions and reflective practice with private CERDEP providers. The sessions focused on goal setting and reflective practice. First Steps visits were intended to take place twice monthly at all centers, though this desired number of visits may not always be achieved.

Credit-bearing courses. Based on our review, credit-bearing courses were not part of the official professional development offerings by OELL or First Steps. However, all teachers with CERDEP private providers who did not have a BA were required to be working toward a four-

year degree (though enrollment in coursework in every term was not required). Our analyses suggest that 36 percent of CERDEP teachers in the private providers did not have BA. Given the policy, some of these teachers may have been enrolled in credit-bearing coursework in the 2017–2018 school year, as they worked toward a four-year degree. First Steps regional coordinators keep records of AA-level teachers' post-secondary progress. However, this information is not stored centrally, and thus we could not document which teachers were enrolled in coursework, or what types of courses they were engaged in.

Professional Development Tracking and Data

The statewide CCCCD, or the center, provides the primary system by which CERDEP teachers track their participation in professional development. The online system allows teachers to record participation in CCCCD-approved training, and print out individual transcripts to document their professional development hours. The system does not function as an ECE workforce registry, and therefore does not keep information on teacher education (beyond teachers' receipt of state-specific ECE credentials) or employment. In addition, the database was primarily designed to produce teacher transcripts and document teachers' professional development hours.

CERDEP and Best Practices in Professional Development

We concluded our review by comparing CERDEP professional development opportunities to six agreed upon, research-based features of effective ECE professional development (U.S. Department of Education, 2010). As listed in Table S.2, CERDEP's professional development opportunities met some of these best practices, including the opportunity for teachers to engage in one-on-one coaching, and activities that build educators' skills to conduct child assessments (features two and five). In other areas—the degree to which professional development experiences were aligned with educator goals and the extent to which state standards were used to ensure consistency (features four and six)—the best practices were somewhat met, but with room for improvement. There were insufficient data on the content of CERDEP professional development sessions to determine whether opportunities were instructionally specific (feature one). Similarly, our review suggests that teachers from the same center or classroom likely participated in shared professional development (the third feature), but the lack of teacher-level data on participation in professional development opportunities did not allow for confirmation of this point. We used this assessment to inform our policy recommendations.

Table S.2. Summary of CERDEP's Alignment with Best Practices in Professional Development

Professional Development Feature	Met by CERDEP
1. Professional development opportunities are content- or instructionally specific	Unable to determine
2. Teachers are provided with individualized training or coaching	Met
3. Teachers within the same classroom or center participate in the same professional development opportunities	Likely met
4. Intensity and duration of opportunities matter, and should be aligned with professional development goals	Somewhat met
5. Professional development opportunities are aligned with educators' ability to conduct child assessments in the appropriate domains	Met
6. State or other organizational standards should be considered when designing professional development opportunities	Somewhat met

SOURCE: U.S. Department of Education (2010); authors' analysis of CERDEP documents and key informant interviews.

Policy Recommendations

The findings associated with both sets of study questions raised a number of policy issues regarding requirements for CERDEP teacher education levels and in-service professional development opportunities. In this final section, we offer a series of interrelated policy recommendations. These recommendations pertain to key components of an ECE workforce professional development system. Professional development systems are made up of the organizations, services, infrastructure, and supports that help to ensure that members of the ECE workforce develop and maintain their skills. These systems, typically at the state level, include the higher education institutions that train preservice teachers, as well as the organizations that provide ongoing in-service training. Systems often function across multiple sectors, supporting educators in different ECE settings (e.g., Head Start, preK programs in public school districts), as well as services administered by faith-based organizations, family child care homes, and other private ECE providers. Prior research has indicated the four key features of an effective professional development system: (1) attention toward defining competencies, establishing teachers' credentials, and developing a career ladder; (2) outreach and access to professional development opportunities; (3) data systems and other infrastructure supports; and (4) financial incentives and resources.

A complete review of the components of South Carolina's ECE workforce professional-development system was outside of the scope of this report. However, our recommendations for

CERDEP related to teacher education and PLOs are relevant for advancing several of the key features of a statewide ECE workforce professional development system.

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Recommendation 1: Convene CERDEP stakeholders to discuss teacher education requirements.

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The SCDE and First Steps should hold one or more convenings with key CERDEP stakeholders to discuss teacher education requirements and the trade-offs that would result from raising the requirement to a BA for all teachers in both public and private providers. Discussions should take into account that in the 2017–2018 school year, the majority of teachers in private settings had already earned a BA, 70 percent of children served in private settings attended a provider where at least one teacher had a BA, and over 90 percent of all CERDEP children across settings were taught by a BA-level teacher. Stakeholders should consider the weak relationship between teacher education and child outcomes, as well as the current movement in the field to professionalize the CERDEP workforce through increasing teachers' education requirements. Changing the teacher education requirement may have implications for multiple aspects of the ECE workforce professional-development system. For example, if all teachers must earn a BA prior to working in CERDEP classrooms, there may be more demand for BA degree programs in ECE. In addition, stakeholders should consider the associated costs of changing teachers' education requirements. As indicated in the companion CERDEP report, programs that require teachers to have a BA typically cost more, in part due to the higher teacher salaries required for more highly trained teachers.

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Recommendation 2. Build on CCCCD's current database to establish a comprehensive statewide workforce registry system.

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CCCCD offers the beginning of a comprehensive data system. South Carolina can potentially build on this existing structure to collect more information on teacher education and professional development. An initial step toward such a system would involve convening stakeholders from across the South Carolina ECE landscape to discuss the need for and goals of a potential statewide data system for all ECE providers. Stakeholders may consider designing a statewide ECE workforce registry that tracks multiple teacher characteristics, including teacher education levels, degrees and credentials, employment history, and teacher participation in in-service professional development (including workshops, training, coaching, and credit-bearing courses).

The registry can also act as a repository for descriptions of professional development opportunities offered throughout the state, to indicate which offerings can count toward the annual requirement, and to certify the trainers, coaches, and mentors who deliver them. Establishing such a system would allow CERDEP and state preschool leaders to see where gaps may exist in professional development opportunities, to ensure that teachers and directors are meeting education requirements, and to determine whether certain patterns emerge around

professional development, teacher or director education, or other key provider characteristics. Indeed, representatives from CCCCD indicated that plans for a statewide early childhood professional registry are in place, with the goal of tracking much of the information described here, including employment, credentials and degrees obtained, and professional development hours. Creating a statewide registry would be an important step toward creating a comprehensive data resource for the state ECE workforce professional development system.

Recommendation 3. Provide specific professional development guidelines and develop a set of common competencies all CERDEP teachers must master in both public and private settings. Plan more shared professional development offerings to ensure that professional development content is consistent across private and public CERDEP providers.

In order to ensure that providers are receiving consistent content, quantity, and intensity of professional development offerings, CERDEP stakeholders should consider implementing more-specific guidelines or requirements that specify exactly what a professional development activity should entail. For example, instead of providing broad professional development content areas in CERDEP legislation, such as child development and curricula in general, the state could require professional development in more specific areas, such as the CERDEP-approved early childhood curricula, and a specific quantity aligned with the importance or complexity of the topic. The professional development guidelines should also include or be developed alongside a core set of skills and competencies that all CERDEP teachers need. Clearly defined competencies are a key component of a professional development system, and will ensure that teachers have the skills needed to be effective educators of young children. CERDEP professional development opportunities can then be designed to help teachers develop and maintain these skills. Further, OELL and SCDE should consider forming local or regional partnerships to offer shared professional development opportunities for teachers from public and private settings. Doing so would help to ensure that regardless of the setting, all CERDEP teachers would have a similar set of competencies and skills. In 2019, South Carolina was awarded a Preschool Development Grant from the Administration for Children and Families at the U.S. Department of Health and Human Services. Plans for the grant include more collaborative ECE professional development across CERDEP settings and other ECE programs in the state.

Recommendation 4: Work to provide more sustained and long-term professional development opportunities.

Some of the professional opportunities First Steps and OELL provided were one-time or discrete professional development workshops. Stakeholders should work to provide more long-term and sustained professional development opportunities that allow teachers to build new skills over time. OELL and First Steps might consider employing evidence-based professional development interventions that combine multiple forms of support—such as trainings, coaching,

and peer networks—into one aligned model over the course of a full school year. These sorts of interventions may increase the quality of the learning opportunities teachers have access to in the professional development system, and might be more likely to have a positive effect on teacher practices and classroom quality.

> **Recommendation 5. Document CERDEP providers' receipt of coaching to ensure that all teachers receive individualized support.**

Coaching can be an effective professional learning support offered as part of an ECE workforce professional development system. While both OELL and First Step implemented coaching as part of their professional development offerings, limited data exist on the amount of coaching support teachers received, such as the number of visits or hours of coaching received. Currently, coaching dosage likely varied between public and private settings, and across teachers within settings. CERDEP stakeholders should consider setting a standard coaching dosage for all CERDEP teachers, and track coaching hours to ensure that all teachers receive adequate support.

Acknowledgments

Abbreviations

3K	state-funded three-year-old prekindergarten
4K	state-funded full-day four-year-old prekindergarten
ACS	American Community Survey
AA	associate degree of arts or science
B3–GOLD	*Teaching Strategies® GOLD Birth Through 3rd Grade Assessment*
BA	bachelor's degree of arts or science
BLOOM	Building Learner Outcomes through Opportunities and Models
BLS	U.S. Bureau of Labor Statistics
CCCCD	South Carolina Center for Child Care Career Development
CDA	Child Development Associate (credential)
CDEPP	Child Development Education Pilot Program
CERDEP	Child Early Reading Development and Education Program
CQI	continuous quality improvement
DECAL	Georgia Department of Early Care and Learning
DSS	Department of Social Services
ECE	early care and education
ECD101	Early Childhood Development 101 course
ELLCO	Early Language and Literacy Classroom Observation
EOC	Education Oversight Committee
EIA	Education Improvement Act
First Steps	South Carolina First Steps
GaPDS	Georgia Professional Development System
HSD	high school diploma
IEP	individual education plan
K–12	kindergarten through 12th grade

LEP	limited English proficiency
MMCI	Making the Most of Classroom Interactions
MTP	My Teaching Partner™
NASEM	National Academies of Sciences, Engineering, and Medicine
NAEYC	National Association for the Education of Young Children
NIEER	National Institute for Early Education Research
OELL	South Carolina Department of Education Office of Early Learning and Literacy
OLLI	Online Library Learning Initiative
preK	prekindergarten, more generally, for three- and four-year old children
PD	professional development
PDG B–5	Preschool Development Grant Birth through Five
PLO	professional learning opportunity
QRIS	quality rating and improvement system
SCDE	South Carolina Department of Education
SpEd	special education
WHE	widely held expectation

1. Introduction

Advances in developmental science indicate that children begin learning at birth and their development in the early years (birth to age eight) is both "rapid and cumulative" (National Academies of Sciences, Engineering, and Medicine [NASEM], 2015, p. 1). Said differently, young children acquire new skills and abilities all the time and their early development serves as the foundation upon which future learning is built. Armed with this science, public sector investments in early care and education (ECE) services have grown as one way to support children's healthy development (Friedman-Krauss et al., 2018). The educators who care for children in these settings play an important role by creating the learning environments that promote children's development. Further, research indicates that consistent relationships with caring, responsive adults—such as teachers in ECE classrooms—are necessary for young children as they navigate the world (Shonkoff, Boyce, and McEwen, 2009). As a result, there has been a renewed call among federal, state, and local ECE stakeholders to ensure that the ECE workforce has the skills needed to be effective educators of young children. Professional development opportunities are the primary mechanism through which ECE practitioners build and maintain these skills (NASEM, 2015; Whitebook and McLean, 2017; McCarthy and Lowenberg, 2017).

In this report, we focus on the education requirements and professional development activities available to the classroom staff in the South Carolina Child Early Reading and Development Education Program (CERDEP). CERDEP is a state-funded full-day four-year-old prekindergarten (4K)[1] program for low-income children at risk of not being ready to start kindergarten (South Carolina Department of Education, undated-b). CERDEP began in the 2006–2007 school year as a pilot program, in response to a court decision concerning the equity of the state school funding formula. The program is implemented using a mixed-delivery system, with both public school districts and licensed private center–based providers able to serve eligible children. In the 2017–2018 school year, the focus of this report, CERDEP served approximately 11,700 children, or about 33 percent of low-income four-year-old children in the state. Like many other state-funded prekindergarten (preK) programs, CERDEP policies specify staff professional preparation and professional development requirements—including the level of education teachers must complete before entering the classroom, as well as the amount of

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[1] We use *prekindergarten*, or *preK*, to refer generally to early education programs of various kinds (e.g., state or federally funded programs or private pay programs) for three- and four-year-old children. We use the term *4K* to refer exclusively to preK programs for four-year-olds, and *3K* to refer to those for three-year-olds. We use the term *early care and education* (*ECE*) to refer to educational and care settings for children ages birth to five and, in some cases, children ages birth to eight.

professional development teachers must engage in while employed by a CERDEP provider. We explore both topics in this report.

In the following sections, we first present background information on the CERDEP program. Then, we draw on existing frameworks for ECE workforce professional development systems to frame our study questions. Next, we discuss our study questions and the data and methods used to address them. The study methods, questions, and the remainder of the report are organized under the two main topics that guided our inquiry: CERDEP teacher education levels and CERDEP teacher professional development. We conclude the chapter with a roadmap for the remainder of the report.

Background on South Carolina CERDEP

CERDEP began as the Child Development Education Pilot Program (CDEPP), a state-funded early childhood education program in low-income districts in the state. The pilot program was founded in 2006 in response to a court ruling in a decades-long legal challenge to South Carolina's public school funding formula. CDEPP was created to remedy the lack of funding for early childhood education in the state's poorest districts. CDEPP was signed into state law as a permanent program in 2014 (South Carolina General Assembly, 2014) and renamed CERDEP. By law, the program must serve children from low-income families in the state's poorest districts, and focus on reading and school readiness (South Carolina Department of Education, undated-a). Here, we provide a brief overview of CERDEP's main programmatic characteristics. We draw heavily from the program review presented in the first report in this series (Karoly and Gomez, 2019). A complete overview of CERDEP's characteristics can be found in Appendix A.[2]

CERDEP is implemented using a mixed-delivery system, with both public school districts and private center–based providers able to serve eligible children. Oversight of the public school district–based programs is provided by the South Carolina Department of Education (SCDE), while South Carolina First Steps to School Readiness (First Steps)—the statewide public-private partnership to increase school readiness—oversees implementation in private providers. To be eligible to implement CERDEP, districts must have a score of 70 percent or higher on the state poverty index.[3] These CERDEP-eligible districts may opt in or out of establishing CERDEP classrooms. Private providers may be located anywhere in the state, including in districts that do not meet the 70 percent poverty threshold. Across both public and private settings, all CERDEP

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[2] This section and Appendix A draw heavily from the following: Friedman-Krauss et al., 2018; South Carolina Education Oversight Committee (EOC), 2017; South Carolina EOC, 2018; South Carolina Department of Education, 2018a; South Carolina Department of Education, 2018b; South Carolina First Steps, 2018a; and South Carolina First Steps, 2018b. The content presented here is very similar to that in the companion report (see Karoly and Gomez, 2019).

[3] The poverty index is determined by the state's General Assembly and is calculated based on the percentage of students and families in a specific district, who are enrolled in Medicaid, Temporary Assistance for Needy Families, the Supplemental Nutrition Assistance Program, or Department of Social Services Foster Care.

providers are required to be licensed by the Division of Early Care and Education in the South Carolina Department of Social Services.

All children served by the program in either public or private settings must live within CERDEP-eligible districts, must have reached age four on or before September 1, and must meet one of the following criteria: (1) have family income at or below 185 percent of the federal poverty guidelines, or (2) be eligible for Medicaid. Families can choose to apply for a CERDEP slot in either a public school district or a private provider. In the 2017–2018 school year, 64 districts were CERDEP-eligible, and 61 opted into the program—approximately 74 percent of the state's 82 total districts. Additionally, 197 private providers across the state implemented CERDEP at the start of the school year in 2017–2018 (192 of these centers contributed data to the analyses in Chapter 2). In this school year, CERDEP served approximately 11,700 children. The large majority of children—83 percent—attended a CERDEP classroom in a public school district, with less than 20 percent of children attending classrooms in private providers. Based on recent state estimates, the 11,700 children served by CERDEP represented about 33 percent of all low-income children in the state at the time.[4] In both private providers and public school districts, CERDEP program must operate for at least 180 school days, five days a week, with at least 6.5 hours of instruction per day. Starting in 2017–2018, programs had the option of offering extended school-day and school-year programs to provide families with additional care; approximately 70 percent of programs offered an extended option in 2017–2018.

The requirements for lead teacher qualifications differ across the public and private settings. In the school districts, all lead teachers are required to have a bachelor's degree (BA). In the private settings, teachers are only required to have a two-year college degree (an associate degree [AA]), in early childhood education, or a two-year college degree in another field with additional early childhood experience (such as having a Child Development Associate [CDA] credential). Once hired, CERDEP requires that all lead teachers complete 15 hours of professional development per school year. In Chapter 3, we will present a detailed review of the teacher professional development activities that teachers had access to in 2017–2018.

Eligible families have the choice to apply for a CERDEP slot in either a public school district or private provider. The literature suggests that many different factors influence families' preK and child care choices (Rose and Elicker, 2008). The children and families who select private providers likely differ from those who select a public school district participating in CERDEP. Some parents may prefer a public school district setting if they have older children already attending school in the district. School districts may also have more resources and services available, e.g., supports for children with special learning needs. Other families may prefer private CERDEP providers. As an example, private settings tend to have longer hours of care (see Karoly and Gomez, 2019); more hours of care may be important for working parents. As noted, the large majority of CERDEP slots are available in public settings, so available space

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[4] Based on estimates of low-income children in the state from EOC (2018).

may also factor into a family's decision. EOC reported in 2017–2018 that some school districts had waitlists of families who had applied for but had not received a CERDEP slot due to space constraints. This data may indicate that there is more demand for slots in public programs than space available. Individual private providers may have had waitlists as well. An investigation into how South Carolina families select private or public school district settings when applying for a CERDEP slot is beyond the scope of this report. However, Appendix C provides a brief description of the demographic characteristics of children across the two settings.

ECE Workforce Professional Development Systems

Professional development has multiple definitions and can take on a number of different forms. In this report, we use the following definition put forth by the National Professional Development Center on Inclusion: "Professional development is facilitated teaching and learning experiences that are transactional and designed to support the acquisition of professional knowledge, skills, and dispositions as well as the application of this knowledge in practice" (National Professional Development Center on Inclusion, 2008, p. 2). Professional development activities are often categorized as either preservice or in-service. Preservice professional development, also called professional preparation, refers to the training, degrees, and credentials educators are required to complete prior to taking a classroom position. In-service professional development refers to the activities educators engage in while they are employed by a provider and actively serving children. Research suggests that both preservice and in-service professional development supports are necessary to develop and retain a high-quality ECE workforce (NASEM, 2015; Schilder, 2016).

As investments in ECE services have grown, so too have the pre- and in-service professional development requirements and opportunities for ECE educators. The need to better organize, track, and manage educational and training opportunities for practitioners led to the development of professional development systems. Professional development systems are made up of the organizations, services, infrastructure, and supports that help to ensure that members of the ECE workforce develop and maintain their skills. The National Center for the Education of Young Children (NAEYC) defines an *ECE workforce professional development system* as a "comprehensive system of preparation and ongoing development and support for all early childhood education professionals working with and on behalf of young children" (LeMoine, 2008, p. 5). These systems typically include the institutions of higher education that train preservice teachers, as well as the organizations that provide ongoing in-service training (Karoly, 2012). The systems often function across multiple sectors, supporting educators in different ECE settings: Head Start and preK programs in public school districts, and services administered by faith-based organizations, family child care homes, and other private ECE providers. These systems not only provide the services and supports to foster educators professional learning, but

also include data components to track teachers' education, training, and credentials (LeMoine, 2008; NAEYC, 2016).

Karoly's (2012, p. 5) review of existing frameworks for ECE workforce professional development systems identified four common components of effective systems:

1. *competencies, credentials,* and a *career ladder* to define what ECE professionals are required to know, how they demonstrate that knowledge, and how they advance professionally

2. *outreach* and *access* to professional development opportunities, for both formal education and ongoing training, to ensure a diverse ECE workforce

3. *data systems* and *other infrastructure supports* to ensure quality

4. the *financial incentives and financial resources* required to support the system.

These four interrelated components offer a broad framework for understanding the key features of a functioning professional development system. The first component suggests that it is necessary for professional development systems to articulate the key competencies ECE educators need, as well as identifying the degrees and credentials that indicate mastery of those skills. It follows that professional development systems must ensure that educators have access to, and are aware of, the opportunities that help them to develop key competencies (component 2). Data systems (component 3) can be used to store information on trainings, workshops, and degree programs, so educators have a central place to search and sign up for professional development opportunities. Data systems are also necessary for tracking educators' degrees, credentials, and the in-service professional opportunities they take up. And, like any system, an ECE workforce professional-development system cannot function without the resources required to support teachers as they engage in their skill-building, as well as the system infrastructure elements (component 4). In this report, we focus on describing the variation in CERDEP teachers' preservice education levels, as well as the in-service activities that they must engage in. These topics cut across the four components of an ECE workforce professional-development system.

CERDEP Teachers' Education Levels: Study Questions, Data Sources, and Methods

In the second chapter of this report, we explore the CERDEP teacher preservice education requirements. Teacher education requirements are related to the first component of ECE workforce professional development systems: Requiring that teachers have a certain level of preservice training is one way to ensure that educators have a particular set of competencies before entering the classroom. While there is overall agreement in the field that being an ECE teacher involves complex, challenging work, the field has yet to reach a consensus regarding the minimum level of education required for educators who care for young children (NASEM,

2015). The research literature yields inconsistent findings regarding whether teachers' degree attainment is related to classroom quality, teachers' instructional practices, or the learning outcomes of the children in their care (Early et al., 2007; Schilder, 2016). The literature also suggests that teachers with the same degree—a four-year degree in early childhood education, for example—may have different knowledge and skills, given the large variation in curricula and coursework across degree programs (Schilder, 2016). Despite these limitations in the empirical evidence, it has become more common in recent years for state ECE policies to require preK teachers to have four-year degree (Schilder, 2016).

This lack of agreement regarding the minimum education level for ECE teachers is evident in CERDEP policy, as the lead teacher education requirement differs depending on whether a teacher is employed by a public or private CERDEP provider. Teachers employed by licensed private center–based CERDEP providers must have at least a two-year AA in early childhood education or a related field, and show that they are working toward a four-year BA degree.[5] CERDEP teachers in public school district programs are required to have a BA. As indicated in our companion CERDEP report, teacher credentialing requirements are not only important when considering classroom quality or children's learning; these requirements also have implications for provider cost and the financial resources necessary for an effective ECE workforce professional development system (Karoly and Gomez, 2019). Programs that require teachers to have a BA typically cost more, in part due to the higher salaries required for more highly trained teachers. A BA requirement may also increase state-level costs for an ECE workforce professional development system, to the extent that the public sector subsidizes the cost for the ECE workforce to acquire four-year degrees and the cost to maintain high-quality teacher preparation programs.

Study Questions

In this report, we shed light on some of these issues by exploring the teacher degree requirements in the CERDEP program. Specifically, we address the following questions:

- What was the distribution of education levels among CERDEP teachers in the 2017–2018 school year?

- Among children who attended private CERDEP providers in the 2017–2018 school year, how did children's language and literacy outcomes in providers where all teachers had a BA compare with those of children who attended providers where only some or no teachers had a BA?

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[5] For simplicity, we abbreviate a two-year degree with AA and a four-year degree with BA, even though either degree may be in the arts (AA or BA) or in the sciences (AS or BS).

The second question focuses only on teachers and children in private CERDEP programs because teachers may or may not have a BA in those settings. In CERDEP programs housed in public school districts, all teachers have a BA or higher, leaving no variation to address the question of interest.[6]

Data and Methods: Administrative Data, Census Data, and Statistical Analysis

To address the first study question, which pertains to teachers' education level, we gathered administrative data from First Steps and SCDE. First Steps provided provider-level data for private center–based programs with numbers of the lead CERDEP teachers by their highest education level. Provider-level administrative data also contained other program characteristics, including program location, indicators of program quality, and the number of children served in the 2017–2018 school year. SCDE provided summary information from administrative records on the distribution of lead teachers by their highest education level for CERDEP teachers in public school districts at the district level. Using these data, we conducted descriptive analyses to understand the distribution of education levels among CERDEP teachers in both public and private settings.

To address the second question, we analyzed child- and provider-level data for private center–based CERDEP programs. All child-level assessment data were stored in a single file managed by SCDE. The file contained information on language and literacy skills and demographic characteristics for all children served in private CERDEP centers in the 2017–2018 school year. As mandated by the CERDEP guidelines, all CERDEP programs assess children's literacy skills at the beginning and end of their 4K year. First Steps requires all private providers to use *Teaching Strategies® GOLD Birth Through 3rd Grade Assessment* (B3–GOLD). B3–GOLD is a standardized assessment designed to measure children's developmental skills. The measure is not a direct assessment of a child's skills. Rather, teachers rate children's skill levels using evidence and information gathered during classroom interactions. CERDEP teachers rate children in two of the domains covered by B3–GOLD: (1) language—including children's ability to listen to and understand verbal language, and use verbal language and other communication skills to express thoughts; and (2) literacy—including children's phonological awareness, phonics skills, word recognition, alphabet knowledge, print knowledge and use, ability to understand and respond to books and other texts, and writing skills. We make use of the B3–GOLD widely held expectations (WHE) scores that report on whether children fall below, meet, or exceed skill level expectations for their age groups (Burts, Baker, and Bickart, 2016). We used

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[6] CERDEP stakeholders may also be interested in comparing the outcomes of children who attended CERDEP in private and public settings. In particular, it may be useful to compare children in private settings where all teachers had a BA with children who attended public CERDEP classrooms (where all teachers were required to have BA). Unfortunately, data limitations do not allow for this comparison. However, Appendix C offers insight into these topics by comparing children who attended various 4K programs in CERDEP public school districts with children in private CERDEP settings.

dichotomous versions of the language and literacy outcomes, which record whether children met or exceeded expectations or whether they fell below expectations. All teachers use the Teaching Strategies online platform to record their ratings; all ratings are then transferred to a central database maintained by SCDE.

To examine the relationship between teacher education level and children's learning in CERDEP private centers, we would ideally be able to match children to the lead teacher in their CERDEP classroom. Theory suggests that the mechanism through which teachers' education levels might be related to student outcomes is via direct teacher-child interactions (Schilder, 2016). However, the CERDEP child-level data do not include a classroom identifier. Thus, we cannot link children to the education level of the teacher in the classroom where they were enrolled. This inability to match students to their CERDEP teachers is a key limitation of this study. Our analysis cannot capture the hypothesized pathway between teacher education level and children's learning, as we do not know which CERDEP classroom teachers were working with which CERDEP children.

Instead, the child-level administrative data were matched to the provider-level administrative data using the provider name. Our main predictor of interest is a provider-level variable that measures the percentage of the provider's CERDEP teachers with a BA. We explored whether the children who attended providers with a higher percentage of teachers who had a BA scored higher or lower on the B3–GOLD than children who attended centers with a lower percentage of teachers who had a BA.

We also gathered data from the American Community Survey (ACS) to include more information in our statistical models on the neighborhoods of the CERDEP private providers (see Chapter 2 and the Appendix B for more detail). We included variables from the 2017 five-year ACS estimates measured at the zip code–level on such community-level characteristics as the distribution of educational attainment of adults aged 25 or older, the race and ethnic composition of the population, and average family household income. These indicators were matched to the child-level data by provider zip code.

Using the child-level data matched to provider characteristics, we used linear probability models to estimate whether there was a relationship between the likelihood of a child meeting or exceeding age-level expectations on the B3–GOLD (versus falling below expectations) and the percentage of CERDEP teachers at private centers with a BA. As we will describe in more detail in Chapter 2, the data and research design do not allow for a causal interpretation of the estimated relationship between teacher education levels and child outcomes. This study is limited to descriptive analyses of the correlations between child outcomes and teacher education levels.

CERDEP In-Service Professional Development: Study Questions, Data Sources, and Methods

In Chapter 3, we explore the in-service professional development opportunities available to CERDEP teachers. In-service professional development is thought to be a cornerstone of high quality preK services (Yoshikawa et al., 2013). In part, because there is variation in the education teachers complete before entering the classroom, in-service professional development is one way to ensure that preK educators develop and maintain a locally agreed-on set of skills needed to promote the learning and development of children in their care (U.S. Department of Education, 2010). Indeed, ensuring access to high-quality professional development is the second identified component of an effective professional development system. Individual evaluations of professional development interventions indicate that they can have a positive effect on teacher practice and classroom quality (Bowne, Yoshikawa, and Snow, 2016; Dickinson and Caswell, 2007; Early et al., 2017; Landry et al., 2009). However, research suggests that certain types of professional development, such as one-on-one or small-group coaching, or trainings that are long-term, sustained, and instructionally specific, may be more effective than other opportunities, such as stand-alone workshops (Muenchow et al., 2013). As a result, it is important to ensure that ECE professional development opportunities include the features most likely to improve teachers' practice.

Study Questions

CERDEP regulations require that all teachers receive 15 hours of in-service training annually. Currently, CERDEP's professional development data systems (component three of a professional development system) collect relatively limited information. For example, there is no single comprehensive data source or a repository detailing all of the professional development opportunities available to CERDEP teachers in both public school districts and private center–based settings. To help address this gap, we review records of available professional development offerings across multiple sources to provide a descriptive picture of the available opportunities for CERDEP educators. Further, we explore variation in the professional opportunities offered to teachers in public and private settings. Specifically, we address the following questions:

- What professional development opportunities were offered to CERDEP educators, including lead teachers and instructional assistants, in the 2017–2018 school year? How frequently were the activities offered (e.g., on a rolling basis, as needed, annually)? In which opportunities did educators participate? What content was offered and how were the trainings delivered?
- To what extent did professional development activities differ among public school districts and private CERDEP providers? To what extent did activities or opportunities vary within public or private CERDEP providers?

- What systems are used to track the teacher professional development opportunities available to CERDEP providers?

In addition, we compare CERDEP's current offerings with what the literature suggests are best practices in professional development for 4K teachers, to offer recommendations on what improvements could be made to CERDEP's current offerings.

Data and Methods: Key Stakeholder Interviews and Document Review

The ideal data to address the study questions regarding CERDEP professional development opportunities and participation would include teacher-level data recording the specific professional development activities they participated in, the hours of participation, and the content of each activity. However, these data were not available for purposes of this study. Given these data limitations, we are unable to provide specific figures on participation or a comparison of the number or nature of professional development opportunities CERDEP teachers across settings received.

In the absence of data on the professional development experiences of individual teachers, we conducted key informant interviews with staff members at CERDEP-affiliated organizations and agencies—including First Steps, the SCDE Office of Early Learning and Literacy (OELL), and the South Carolina Center for Child Care Career Development (CCCCD)—to better understand available professional development opportunities for CERDEP teachers. We conducted four key stakeholder interviews with representatives from CERDEP-affiliated organizations across the state who were knowledgeable about the program and related policies. Interviewees were asked about the types and content of professional development activities (e.g., workshops and coaching), how professional development attendance is tracked, and how meeting the annual requirement is documented (see Appendix D for a copy of the interview protocol). RAND researchers took detailed notes during these interviews, which were then reviewed and summarized for the results presented in this report. In some cases, we engaged in follow-up communication with interviewees to clarify details and obtain further information on professional development opportunities.

To gather additional factual information on the CERDEP program, we conducted a thorough document review of CERDEP policies and procedures. Documents reviewed included:
- CERDEP guidelines

- CERDEP legislation

- state agency annual reports

- CERDEP evaluation reports

- internal memos on professional development opportunities

- agency website pages

- illustrative professional development tracking reports.

We compiled information from the documents and key stakeholder interviews to provide a comprehensive overview of CERDEP professional development offerings presented in Chapter 3.

Roadmap for the Report

In the next two chapters, we address the study questions. In Chapter 2, we turn to teacher education levels. We review relevant extant literature, compare CERDEP teacher education requirements with other state 4K programs, describe the distribution of teacher education levels in public and private settings, and present results from our descriptive analyses exploring the relationship between teacher education levels and children's language and literacy outcomes. In Chapter 3, we turn to teacher professional development. We review the literature describing best practices in teacher professional development for ECE teachers, while also describing how other state-funded preK programs train in-service teachers. We then describe the professional development activities CERDEP teachers in public and private settings had access to in the 2017–2018 school year. The final chapter summarizes the key results from the study, identifies important policy implications, and provides a set of recommendations for CERDEP stakeholders.

2. CERDEP Teacher Education Levels and Child Outcomes

In this chapter, we focus on the education levels of CERDEP teachers. We address two key questions:

- What was the distribution of education levels among CERDEP teachers in the 2017–2018 school year?

- Among children who attended private CERDEP providers in the 2017–2018 school year, how did the language and literacy outcomes of children in providers where all teachers had a BA compare with children who attended providers where some or no teachers had a BA?

Before presenting findings, we review the literature on the importance of teacher education levels in preK programs and describe the teacher education requirements in other state-funded preK programs.

Teacher Education Levels and Child Outcomes in the Early Care and Education Field

It has become increasingly common for federal, state, and local ECE policies to mandate that teachers in preK and other early education settings have a BA or higher. For example, the 2007 reauthorization of Head Start specified that, by 2013, at least 50 percent of Head Start lead teachers would be required to have a BA or higher. In the 2017 program year, over 70 percent of Head Start teachers met this mark (U.S. Department of Health and Human Services, Head Start Early Childhood Learning and Knowledge Center, 2017). Slightly over half of state-funded preK programs require lead teachers to have a BA (Friedman-Kraus and Kasmin, 2018). In the case of South Carolina, CERDEP does not require all teachers to complete a BA before entering the classroom, though program stakeholders have discussed raising the educational requirement for all teachers.

In the larger ECE field, one motivation for increasing the educational requirements for teachers is the emergence of research suggesting a positive relationship between teacher education and classroom quality and child outcomes. This literature, however, does not present consistent findings. Some work indicates that children who had teachers with higher levels of educational attainment—typically teachers with a BA or higher—scored higher on early childhood language and literacy assessments than children whose teachers only had a high school diploma (HSD) or an AA (Zill et al., 2001; Burchinal et al., 2002; Barnett, 2003). However, other works find little robust evidence for this positive relationship. Early et al.'s (2007) work provides one of the most comprehensive investigations of the relationship between

ECE teacher education levels and child outcomes. The authors used data from seven major studies of preK programs and define teacher education levels in a number of ways—looking across multiple degree-levels (HSD, an AA, a BA, or a graduate degree), and comparing teachers who had a degree in an ECE field versus teachers whose degrees were in an unrelated field. The large majority of the results from the studies reviewed were null. Although the research design of this paper did not support causal interpretations, the evidence looking across data from multiple studies included in the analysis indicated no relationship between teacher education levels and children's outcomes (Early et al., 2007).

There is more consistent evidence indicating a relationship between teacher education levels and measures of ECE classroom quality. In a recent systematic review, Manning et al. (2019) reported results from 48 different studies, conducted between 1980 and 2015, that investigated the relationship between early childhood teacher qualifications and classroom quality. This study found a positive and statistically significant relationship between teacher qualifications (primarily defined as degree level) and measures of process quality in early childhood environments, e.g., the quality of teacher-child interactions and teachers' support of peer-to-peer relationships. These correlational findings are consistent with other works that indicate teachers with higher levels of education create more effective learning environments for young children (Kelley and Camilli, 2007; Whitebook, 2003).

As noted, the large majority of the studies in this literature are correlational in nature, and do not estimate the *causal* relationship between teacher education levels and child outcomes or classroom quality. There are several selection processes that lead individuals to pursue or not pursue higher education; that is, teachers who earn a BA differ in important ways from teachers who do not have such attainment. For example, teachers who pursue a BA may have higher overall language and mathematics abilities prior to entering their degree programs than teachers who do not pursue a BA. It may be these preexisting academic skills that lead BA-level teachers to better support children or create higher quality classrooms, not the skills or knowledge acquired in their BA programs. Or there may be important sorting processes at work, related to which children end up in classrooms with more qualified teachers. While some of the analyses cited earlier control for other teacher and child characteristics that may be related to both teachers' degree levels and child outcomes, it is not possible to account for all factors that may explain variation in teachers' educational attainment. Therefore, we cannot know whether it is teachers' levels of education that create higher-quality preschool classrooms, children's outcomes, or other characteristics. While the research described earlier and presented here is useful for understanding how teacher characteristics are or are not related to children's learning, some scholars and policymakers call for the field to exercise caution when using this literature to drive policy decisions (Kelley and Camilli, 2007).

A desire to professionalize the ECE field is another driving force behind the trend of raising expectations and requirements for early childhood educators' credentials. Early childhood educators have been viewed as less skilled than those in kindergarten to 12th-grade (K–12)

settings, and the field is seen as having little prestige or importance (Boyd, 2013). Further, ECE teachers typically earn much less than K–12 teachers, signaling that the work of ECE practitioners is less valued than that of their K–12 counterparts (NASEM, 2015). However, as the science underpinning our understanding of early childhood development has grown, so too has the call for more respect and higher training standards for early childhood educators. Developmental science indicates that the children have a high capacity for learning in their early years. Thus, early childhood educators play a key role in creating supportive, nurturing environments that help children thrive. Advocates argue that calling for higher educational standards for ECE teachers is one way to signal to the importance of the field and garner more respect and higher earnings for such teachers (NASEM, 2015; McCarthy and Lowenberg, 2017).

Teacher Education Credentialing Requirement in CERDEP and Other State-Funded PreK Programs

As described earlier, the teacher education requirements for CERDEP educators differ in public and private CERDEP settings. Teachers in public school districts settings are required to have a BA—the same standard all K-12 teachers who work for SCDE schools are held to. In private CERDEP settings, teachers with a BA are preferred, but CERDEP policy only requires that teachers have earned an AA and show documentation that they are working toward earning a four-year college degree. Teachers are not required to be enrolled in courses at all times, but they must complete a four-year degree within four years of being hired by a CERDEP provider to remain a CERDEP teacher. Although the required degree for lead teachers differs across public and private settings, all lead teachers across both settings are required to have specialized training in early childhood education. In public settings, teachers must have a South Carolina teacher certificate in early childhood or elementary education, and in the private settings, teachers' AA must be in early childhood or a related field, or they must show completion of other specialized training in the fields. Based on data from the 2016–17 school year, 35 of 60 state-funded preK programs, just over half, required all lead teachers to have a four-year degree. In this way, CERDEP's public and private settings each mirror about half of the nation's other programs in terms of degree requirements (Friedman-Krauss and Kasmin, 2018). The National Institute for Early Education Research (NIEER)'s benchmark standard for lead teacher education requires that all teachers have at least a BA. Because the policy dictating the minimum education requirement in private CERDEP providers does not meet this benchmark, this is one area where South Carolina falls short of NIEER's best practices.

Similarly, CERDEP's requirement does not meet NIEER's standards for assistant teacher (known as instructional assistants in South Carolina) education requirements. Assistant teachers in both private and public CERDEP programs are required to have at least an HSD, while the NIEER benchmark standard requires that assistants have at least a CDA credential. However, instructional assistants are required to complete a South Carolina–developed three-credit hour

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introductory course in early childhood education known as Early Childhood Development 101 (ECD101). The course is offered at all 16 technical and community colleges in the state. All instructional assistants, in both private and public settings, must enroll in and complete this course within one year of being employed as an instructional assistant. In this way, all instructional assistants do receive specialized training in early childhood education and development.

To provide a comparison of how CERDEP's teacher requirements measure up to other state-funded preK programs, we reviewed the teacher education requirements for the following nine state-funded 4K programs:

- Alabama First Class Pre-K

- Florida Voluntary Prekindergarten Program

- Georgia Preschool Program

- Kentucky Preschool Program

- Mississippi Early Learning Collaborative

- North Carolina Pre-K Program

- Tennessee Voluntary Pre-K

- Virginia Preschool Initiative (VPI)

- West Virginia Universal Pre-K.

In Table 2.1, we represent the results of this review. Seven of the programs we reviewed meet NIEER's benchmark standard for lead teacher education by requiring all teachers to have a BA. Florida and West Virginia, like South Carolina, do not meet this benchmark (based on information collected from the 2016–2017 school year). The information in Table 2.1 suggests that having different credentialing requirements across private and public settings, as in South Carolina, is rare among the reviewed states. Although almost all of the 4K programs we reviewed are implemented through a mixed-delivery system, Virginia is the only other state in which teachers in private settings have a lower degree requirement (an HSD) than teachers in public school settings (a BA). Although assistant teachers are not the focus of the CERDEP analysis presented in this chapter, we also reviewed the assistant teacher requirement as a point of comparison. Across this set of preK programs, there is more variation in the degree requirements for the assistant teachers as compared with lead teachers. Three of the 4K programs surveyed require assistant teachers to have a CDA or higher and thus meet NIEER's standard. Five programs, including CERDEP, require assistants to have only an HSD or equivalent. Florida and Virginia's private providers have no education requirements for assistant teachers.

Table 2.1. Education Requirements for Lead and Assistant Teachers in State 4K Programs

State Program	Lead Teachers			Assistant Teachers	
	Credential Requirement	Meets NIEER Standard	Different Requirements Across Settings	Credential Requirement	Meets NIEER Standard
Alabama First Class Pre-K	BA with specialization in ECE	✓	No	CDA or 9 ECE/CD credits	✓
Florida Voluntary Prekindergarten Program	CDA or equivalent		No	None	
Georgia Preschool Program	BA with specialization in ECE	✓	No	CDA	✓
Kentucky Preschool Program	BA with specialization in ECE	✓	No	HSD	
Mississippi Early Learning Collaborative	BA with specialization in ECE	✓	No	AA in ECE, CD	✓
North Carolina Pre-K Program	BA with specialization in ECE	✓	No	HSD	
South Carolina CERDEP	*Public Settings*: BA with specialization in ECE *Private Settings*: AA with specialization in ECE		Yes	HSD+ ECD101	
Tennessee Voluntary Pre-K	BA w/ specialization in ECE	✓	No	HSD	
Virginia Preschool Initiative (VPI)	*Public Settings*: BA with specialization in ECE *Private Settings*: HSD with specialized training in ECE		Yes	*Public Settings*: HSD *Private Settings*: No requirement	
West Virginia Universal Pre-K	BA with specialization in ECE	✓	No	CDA	✓

SOURCE: Friedman-Krauss et al. (2018).
NOTES: SpEd = special education. All data pertain to the 2016–2017 school year, except Florida, where the data are for the 2013–2014 year.

Teacher Education Levels and Child Outcomes in CERDEP

In Table 2.2, we present information on the distribution of education levels of lead CERDEP teachers in private center–based providers and public school district programs.[7] The numbers in Table 2.2 refer to numbers and percentages of individual teachers. First Steps administrative records indicate that 211 lead teachers were employed by 192 CERDEP private providers in the 2017–2018 school year.[8] Almost two-thirds of these teachers (approximately 64 percent) had attained a BA or higher. The majority of the teachers who had education beyond a BA— approximately 12 percent of teachers total—had a master's, doctoral, or professional degree. By contrast, and by design, the distribution of teacher education levels in the public settings looks somewhat different. First, with nearly 600 lead teachers in 61 districts, the public schools employ about three times as many CERDEP teachers as the private settings. This differential is to be expected, given that the public schools served the vast majority of CERDEP children—over 80 percent. One hundred percent of teachers in the public districts had a BA; with slightly over 50 percent of teachers having a master's degree, professional, or doctoral degree.

Table 2.2. Distribution of Education Level for CERDEP Lead Teachers: By Provider Type

Teacher Highest Degree	Public School Districts		Private Providers	
	N	Percentage	N	Percentage
AA	0	0.0	76	36.0
BA	274	45.7	110	52.1
Master's, doctoral, or professional degree	325	54.3	25	11.9
Total	599	100.0	211	100.0

SOURCE: Public school district data as reported in SCDE (2018a); authors' analysis of First Steps administrative data (2017–2018).

To estimate the relationship between teacher education levels and child outcomes, we limited our analysis to children in private CERDEP settings, as we were interested in understanding whether there is a difference in child outcomes among children who attended where all teachers had a BA, as compared with children who attended centers where some or no teachers had a BA. These analyses would not be possible for children in public settings because, as shown in Table 2.2, all teachers in public school districts had at least a BA. Available data for the private settings did not allow us to link teachers and children in private CERDEP providers with multiple classrooms. That is, if a private provider had two or more lead CERDEP teachers in multiple classrooms, we do not know which classrooms the children were in, or which teacher was their primary caregiver. For this reason, we explore the relationship between the share of teachers in private CERDEP providers who had a BA and children's outcomes. Specifically, we assigned

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[7] There was no information available on the education levels of CERDEP instructional assistants.

[8] At the start of the 2017–2018 school year, First Steps reported a total of 197 providers; however, five providers left the program by the end of the school year. We report on only the remaining 192 providers.

private CERDEP providers to one of three categories: (1) providers where all CERDEP teachers had a BA; (2) providers where some had a BA; and (3) and providers where no CERDEP teachers had a BA.[9] Across all 192 providers, the number of CERDEP teachers per center ranged from one to three, with an average of just over one CERDEP teacher per provider.

We present descriptive statistics from this categorization in Table 2.3; the top panel of this table includes information for all children and providers among the 192 providers who contributed data on teacher education. The numbers reported on the left side of Table 2.3 refer to numbers and percentages of individual private providers. The majority of providers fell into categories one and three; all CERDEP teachers had BA—62 percent of providers; and no CERDEP teachers had a BA—35 percent of providers. Only about 3 percent of providers employed multiple CERDEP teachers, some of whom did and some of whom did not have a BA. Among these centers, either 50 percent or 33 percent of CERDEP teachers had a BA. Taken together, there was little variation in teacher education levels within CERDEP providers. Many providers had only one teacher—and at centers with multiple teachers, those teachers tended to have the same level of educational attainment.

Table 2.3. Distribution of Private Providers and Children by Share of CERDEP Teachers with a BA: Full and Analytic Samples

	Providers		Children	
Indicator	*N*	Percentage	*N*	Percentage
All Children and Providers				
All teachers with a BA	119	62.9	1,488	63.5
Some teachers with a BA	5	2.6	156	6.7
No teachers with a BA	68	35.4	698	29.8
Total	192	100.0	2,342	100.0
Analytic Sample				
All teachers with a BA	117	62.2	1,211	65.1
Some teachers with a BA	4	2.1	110	5.9
No teachers with a BA	67	35.6	539	29.0
Total	188	100.0	1,860	100.0

SOURCE: Authors' analysis of First Steps and SCDE administrative data.
NOTE: The analytic sample includes children who attended a private provider for which the teacher education levels were observed, and that had B3-GOLD scores at the beginning and end of the year.

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[9] Note that many, if not most, private CERDEP providers also served children who were not funded by the CERDEP program (e.g., infants and toddlers, other preschool-aged children). As such, these providers likely employed other teachers who cared for these children. The categorization of providers with different percentages of BA-level teachers refers to CERDEP teachers only, or teachers who led classrooms serving CERDEP children. The providers may have employed other teachers—with or without a BA—who are not counted here.

We also present the number of CERDEP children who attended providers in each of the three categories. A total of 2,342 children were present in the administrative data. These children attended one of the 192 private CERDEP providers at some point during the 2017–2018 school year and were assessed at either the beginning or end of the year. Approximately 60 percent of these children attended providers where all CERDEP teachers had a BA, and about 6 percent of children attended providers where some had a BA. Therefore, approximately two-thirds of children served in private settings attended a center where at least one lead teacher had a BA. The remaining 30 percent of children attended providers where no teacher had four-year college degree.

In the bottom panel of Table 2.3, we present the same statistics for the providers and children included in our analytic sample. We limited our analytic sample to children who had B3–GOLD assessment scores at both the beginning and end of the 4K year and who had observed data on the demographic characteristics collected in the SCDE data set. These inclusion criteria brought our sample to 1860 children in 188 providers, or approximately 80 percent of children tested and 97 percent of total providers. The breakdown of children across the three different provider characteristics is very similar to the full sample, with about 70 percent of children in providers where some or all CERDEP teachers had a BA.

While the remainder of our analyses focus on children who attended CERDEP in private providers only, it is important to note that a minority of all CERDEP children were served in private settings in the 2017–2018 school year—17 percent of the approximately 11,700 children total. The large majority of children who attended CERDEP in the 2017–2018 school year (about 83 percent) did so in the public school districts (see Appendix A and Karoly and Gomez [2019] for a more-detailed discussion of CERDEP enrollment patterns). All children who attended CERDEP in public settings were enrolled in a classroom with a BA-level teacher. Therefore, when accounting for the fact that about 65 percent of children in private settings attended a center where all teachers had a BA, approximately 94 percent of all children, or nearly all children across public and private settings, were taught by a teacher with a four-year degree.

Estimating the Relationship Between Teacher Education Levels and Child Outcomes

To understand whether there was a relationship between the share of teachers in private CERDEP providers who had a BA and child learning outcomes, we first present the raw percentages of children who met or exceeded age-level expectations on the B3–GOLD language and literacy scales at the end of 4K for the total analytic sample, and by the three provider categories (see Table 2.4). Consistent with previous reports of CERDEP children's scores on the end of year 4K assessments (EOC, 2019), we found that the large majority of all children met or exceeded age-level expectations on the B3–GOLD assessments. Specifically, of all children in the analytic sample, 85 percent and nearly 90 percent met or exceeded expectations on the language and literacy scales, respectively. The table also shows that before accounting for any child demographic characteristics or key provider characteristics, a higher percentage of children

Table 2.4. Children's End of 4K B3–GOLD Language and Literacy Scores for the Analytic Sample of Children in Private Providers by Provider Teacher Education Category

Indicator	Total (Analytic Sample)	Provider Teacher Education Category		
		All Teachers Have a BA	Some Teachers Have a BA	No Teachers Have a BA
Counts				
Language				
Meets or exceeds expectations	1,581	1,048	91	442
Below expectations	279	163	19	97
Total	1,860	1,211	110	539
Literacy				
Meets or exceeds expectations	1,686	1,098	95	493
Below expectations	171	110	15	46
Total	1,857	1,208	110	539
Percentage Distribution				
Language				
Meets or exceeds expectations	85.0	86.5	82.7	82.0
Below expectations	15.0	13.5	17.3	18.0
Total	100.0	100.0	100.0	100.0
Literacy				
Meets or exceeds expectations	90.8	90.9	86.4	91.5
Below expectations	9.2	9.1	13.6	8.5
Total	100.0	100.0	100.0	100.0

SOURCE: Author's analysis of First Steps and SCDE data.

who attended centers where all or some of the teachers had a BA met or exceeded age-level expectations on the language scale at the end of 4K, as compared with children who attended providers where no CERDEP teachers had BA. Almost 87 percent of children who attended centers where all teachers had a BA met or exceeded expectations, as compared with 82 percent of children who attended centers where no CERDEP teachers had a BA. The pattern is slightly different for the literacy outcome. Across all three types of providers, approximately 90 percent of children met or exceeded age expectations on the literacy outcome. Indeed, a slightly larger percentage of children in providers where no teachers had a BA met or exceeded expectations (92 percent), as compared with children in centers where some or all teachers had a BA (86 and 91 percent, respectively). However, the contrasts across the groups, for both outcomes, are small—no larger than five percentage points for any one comparison.[10]

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[10] In addition to comparing the raw percentages, we also used linear probability models to compare the likelihood that children across the different provider groups met or exceeded expectations (see Appendix B for methodological

While useful for painting a general picture of how children across the different provider groups scored at the end of their 4K year, these comparisons do not take into account the selection of children into providers: That is, we cannot be sure that teachers' education levels cause these differences. Children are not randomly assigned to centers with different percentages of BA-level teachers. Indeed, the literature suggests that many different factors play into parents' ECE decisions (Gould and Cooke, 2015). It is possible that parents with more resources are likely to select providers with higher levels of education. These enterprising parents may be better able to support their children's learning at home as well. As such, the higher skill level (on the language outcome) of children in centers with teachers with a BA might not be caused by teacher education, but by their home environment. Similarly, the providers that attract BA-level teachers may be different in important ways from those that employ teachers with an AA. The center-level characteristics may help to explain some of the differences in child outcomes.

For these reasons, we conducted statistical comparison of children's outcomes by the three provider categories, controlling for key child and provider characteristics.[11] These characteristics include children's language and literacy scores from the beginning of their 4K year, age, race, and whether they had an individual education plan (IEP). Controlling for these characteristics may help account for the difference between children whose parents choose for them to attend centers where all teachers had a BA, as compared with centers where some or no teachers had a BA. The center characteristics include the total number of CERDEP teachers and children, measures of center quality, whether the provider was new to CERDEP, and the type of program the provider offered (e.g., traditional year or extended day). We also included census characteristics, using the center's zip code,[12] such as the percentage of adults with different degree levels and average family income (see Appendix B for a full list of covariates and descriptive statistics). Controlling for these characteristics may help account for important variation between centers who employ teachers with different degree levels.

By controlling for these characteristics, the statistical comparisons we present are akin to comparing children who went to centers with teachers with different levels of education, with all other characteristics being equal. Importantly, these analyses cannot determine whether there is a causal link between teacher education and child outcomes. While we are able to account for some important child and center characteristics, there are likely other unobserved characteristics

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details). These tests yielded one statistically significant result for the language outcome only: children in centers where all teachers had a BA were significantly more likely to meet or exceed expectations than children in centers where no teachers had a BA. However, this result was not robust to a cluster correction that accounted for children nested within centers.

[11] We used linear probability models, with robust standard errors to adjust for children nested within centers. Complete methodological details are explained in Appendix B.

[12] We note that we did not have access to child addresses and therefore do not know whether children lived in the same zip codes as the centers they attended. For this reason, the zip code–level control may not explain selection processes at the child level, but rather at the provider level.

that may affect teacher education levels and children outcomes. For example, we have no other information on the teachers themselves. As discussed earlier, there could be other teacher characteristics that are related to both teacher degree levels and child outcomes that are not included here. However, the analyses are still useful as they provide a more nuanced understanding of the comparison of child outcomes by teacher education levels.

In addition to accounting for key control variables, these statistical tests allow us to explore whether any differences between the groups are statistically significant. Statistical significance is an indicator of the certainty we can attribute to the results. If a result is statistically significant, we have confidence that the estimated differences were not due only to idiosyncrasies of the particular sample or measurement occasion; rather, we have confidence that the estimated results represent a difference in the population of interest.

When controlling for a set of key child and provider characteristics, we found no statistically significant differences in children's end-of-year B3–GOLD language and literacy scores when comparing children who attended private providers where all teachers had a BA with children who attended private providers where some or no teachers had a BA. Said differently, children who attended providers where all CERDEP teachers had a BA were equally as likely to meet or exceed age-level expectations on the language and literacy scores as children who attended providers where only some or no CERDEP teachers had a BA. These analyses provide no evidence to suggest that, when comparing otherwise similar children who attended providers with similar characteristics, children with teachers who had a higher degree level ended their 4K year with stronger language or literacy skills. This null finding is consistent with the majority of the literature described earlier.

Research indicates that requiring teachers to have a certain level of education should not be the only programmatic characteristic designed to ensure high-quality learning environments for young children (Schilder, 2016). Indeed, other supports—specifically, ongoing in-service professional development for teachers— should be a part of an effective preK program. In the CERDEP context, teachers who do not have a BA are required to show that they are making progress toward earning a four-year college degree and must complete a degree within four years. In this way, teachers with only an AA are required to receive professional development in the form of their degree program. First Steps regional coordinators keep local records on teachers' progress; however, these data are not stored centrally, and we were not available to determine what percentage of teachers with an AA were actively enrolled in coursework during the 2017–2018 school year. However, if some of the 36 percent of teachers who had an AA were receiving BA-level instruction during the coursework on how to create effective learning environments for young children, it is possible that their classroom practices looked similar to teachers who had already earned a BA. This is one explanation as to why we do not detect a relationship between child outcomes and teachers' levels of education. In the next chapter, we continue to explore this issue by taking a closer look at all the in-service professional development opportunities that CERDEP teachers had access to in the 2017–2018 school year.

3. Professional Development for CERDEP Teachers

This chapter focuses on the professional development opportunities available to CERDEP teachers in public and private settings. Specifically, we sought to answer the following research questions:

- What professional development opportunities were offered to CERDEP educators, including lead teachers and instructional assistants, in the 2017–2018 school year? How frequently were the activities offered (e.g., on a rolling basis, as needed, annually)? In which opportunities did educators participate? What content was offered and how were the trainings delivered?
- To what extent did professional development activities differ between public school districts and private CERDEP providers? To what extent did activities or opportunities vary within public or private CERDEP providers?
- What systems are used to track the teacher professional development opportunities available to CERDEP providers?

We begin by reviewing the literature on professional development systems and models in early childhood settings, and professional development requirements in other state-funded early childhood programs. In our review of relevant professional development interventions and models, we focus primarily on literacy-related models or interventions, as early reading in children is one main goal of CERDEP. Based the analysis of our interviews and document review (see Chapter 1 for details on these methods), we present an overview of the CERDEP in-service professional development requirements, a summary of the professional development offerings in the 2017–2018 school year, and findings from our review of CERDEP's professional development requirement tracking system.

Professional Development for ECE Practitioners

In-service ECE professional development includes different activities and opportunities with various goals and intended outcomes for teachers. As Sheridan et al. (2009) state, "… professional development in early childhood programs refers to a number of experiences that promote education, training, and development opportunities for early childhood practitioners who do or will work with young children . . . (p. 379)." For example, teachers can attend a week-long conference or seminar that covers multiple topics and domains, or attend quarterly hour-long workshops focused on a specific domain. Classroom- or school-based activities, such as coaching or professional learning communities with other teachers, are another way teachers may experience a type of professional development. Additionally, such online activities as webinars or interactive workshops can provide teachers with relevant training and development

activities, much like in-person opportunities. Cannon et al. (2016) present a taxonomy of common ECE professional supports, or activities. We draw on definitions of three of these activities for this report:

1. **Non–credit-bearing workshops,** seminars or courses offered by a variety of organizations to build teachers' skills. These workshops can focus on a range of topics, sometimes take place during conferences, and can be in-person or delivered virtually. They are typical of the in-service professional development teachers often receive.

2. **Coaching or mentoring,** or the one-on-one or small group support teachers receive from an experienced expert to help improve their practice.

3. **Credit-bearing coursework,** or courses at formal academic institutions, usually for the purpose of earning a postsecondary degree or credential. This activity is typical of, but not exclusive to, preservice professional development.

Evaluations of these different professional development activities suggest that they can have positive effects on teacher practices, classroom quality scores, and child developmental outcomes, but that is not always the case (e.g., Bowne, Yoshikawa, and Snow, 2016; Dickinson and Caswell, 2007; Early et al., 2017; Landry et al., 2009; Landry et al., 2006; Powell et al., 2010). These evaluations have used multiple methods and focused on a variety of classroom quality outcomes or children's school readiness skills in examining various professional development interventions (e.g., online-only courses, workshops, in-person courses, a mix of professional development offerings). However, the literature suggests different levels of effectiveness depending on the professional development activity.

Professional development workshops are the most common form of in-service activity for ECE teachers (Cannon et al., 2016). Some studies show that participation in standalone workshops can be positively related to teacher practice (Girolametto et al., 2007). However, comprehensive reviews of the literature indicate that standalone workshops or courses may not be effective forms of professional development and do not show consistently positive relationships with how teachers perform in the classroom, or to child outcomes (Bowman, Donovan, and Burns, 2000; Schachter, 2015). Non–credit-bearing workshops and courses may be more likely to be related to changes in teachers' practices when they are long term, sustained, or included in conjunction with other types of professional development, like the coaching interventions we turn to next (Garet et al., 2001; Gomez, Kagan, and Fox, 2015).

There is growing evidence on the effectiveness of coaching and mentoring interventions. One such piece of evidence is a randomized evaluation of an early literacy professional development intervention for Head Start teachers that included two coaching treatment conditions—one delivered in person and the other delivered remotely (Powell et al., 2010). The half-school year intervention included a two-day workshop at the start of the semester, followed by seven coaching sessions that focused intensely on individualized support for literacy instruction. The experimental evaluation of the intervention showed positive effects, no matter the treatment type

(onsite compared with remote coaching), on classroom language and literacy supports and children's letter knowledge, writing, and sound-blending skills. Other experimental evaluations of intensive coaching interventions have also shown positive effects on teachers' classroom practices, such as the quality of interactions between teachers and students (Early et al., 2014).

As noted earlier, there is also evidence to suggest that professional development supports that combine workshops and trainings, along with coaching services, can yield positive effects. For example, a rigorous evaluation of an early literacy professional development intervention, implemented in preschools and child care centers serving low-income children, also had a positive effect on teacher instructional practices and children's literacy and language school readiness skills (Landry et al., 2009). The intervention had four treatment conditions to which participating schools were randomly assigned. The treatment conditions included different combinations of the following supports: online training, in-classroom mentoring, and detailed monitoring and feedback on instructional practice and children's progress. Results from the study indicate that teacher practices and child outcomes were most positively affected by the intensive early literacy professional development treatment that included in-person mentoring, the online course, and monitoring that provided detailed feedback to teachers. Neuman and Cunningham (2009) found a similarly positive result of a training and coaching intervention on teachers' language and literacy instructional practices. A recent meta-analysis supports these individual study findings and indicates that intensive literacy-focused professional development (e.g., interventions that include multiple professional development opportunities, such as workshops, coaching, online trainings) and coaching had the strongest positive relationships with classroom processes (Markussen-Brown et al., 2017).

We focus less attention here on credit-bearing courses, as they are a less common form of in-service professional development, and not typically offered by organizations serving preK teachers (Muenchow et al., 2013). As we describe in Chapter 2, and as the results of our analysis suggest, there is conflicting evidence regarding the association between teachers' education levels—which requires the completion of credit-bearing courses—and child outcomes. However, teacher education levels may be associated with classroom practice and other measures of classroom quality (Manning et al., 2017). There have been few evaluations of the effects of discrete credit-bearing courses (as opposed completing a full degree course). The limited evidence is mixed, with some studies suggesting null effects and others describing a positive relationship between teachers' participation in credit-bearing courses and teacher's classroom practice (Muenchow et al., 2013).

Key Elements of Professional Development Strategies and Interventions

Although some of the rigorous evaluations described in the previous section indicate that in-service professional development opportunities in ECE can have positive effects on teacher, classroom, and child outcomes, not all interventions produce significant results. This may have several explanations, including the effectiveness of the intervention components or fidelity of

implementation. Given that many professional development opportunities are multifaceted with a number of different activities and strategies, it can often be difficult to determine the specific components or ingredients that make professional development effective, and high-quality professional development is often defined in different ways. For example, teacher professional development is one of NIEER's benchmark standards for preschool quality. To meet the quality standard, teachers in state preK programs must receive at least 15 hours of professional development per year, some of which must include individualize coaching, and all teachers must have a written, annual individualized professional development plan (Friedman-Krauss et al., 2018). This benchmark is based on recent, rigorous research regarding the effectiveness of professional development, including teacher coaching, for improving classroom quality and student outcomes (Egert, Fukkink, and Eckhardt, 2018; Kraft, Blazar, and Hogan, 2018).

K-12 education research indicates that professional development opportunities that provide active learning elements, have a clear content-knowledge focus, and are aligned with required standards or other activities teachers participate in can help teachers gain knowledge, strengthen their skills, or both (Garet et al., 2001). In the ECE field, it is likely that similar professional development components are related to effectiveness, meaning positive changes in teacher practices and child outcomes. In a comprehensive literature review of effective professional development elements, Zaslow and colleagues (U.S. Department of Education, 2010) identified six features of professional development that may have the most meaningful and lasting effects on teacher practices and child outcomes.

1. **Opportunities are content- or instructionally specific:** Workshops or trainings are clearly linked to a content area (e.g., language or literacy) and focus on specialized instruction, instead of having broad content or techniques as the professional development objectives.

2. **Teachers are provided with individualized training or coaching:** Individualized professional development tended to show the biggest effect on teacher practices; however, the authors emphasize that this is not always the case, and more research is needed to understand which components of coaching or mentoring matter the most for teacher practice.

3. **Teachers within the same classroom or center participate in the same professional development opportunities:** Providing workshops, courses, or other professional learning experiences to teachers in the same location can promote alignment in instructional practices and collaboration among teachers.

4. **Intensity and duration of opportunities matter, and should be aligned with professional development goals:** Ensuring that professional development opportunities' intensity (e.g., number of hours) and duration (e.g., multiday or semester-long courses) match the stated goals may be related to teacher and child outcomes. In K-12 education this notion is also supported, with research findings showing that longer, intensive

professional development is likely to have a bigger effect on teacher practices than shorter, less intensive opportunities (Garet et al., 2001).

5. **Professional development opportunities are aligned with educators' ability to conduct child assessments in the appropriate domains:** Educators should be prepared to utilize assessments to better understand the areas of strengths and gaps in children's skills and knowledge and then use the information to adjust practices.

6. **State or other organizational standards should be considered when designing professional development opportunities:** Offerings should be aligned with required standards so that consistent information is provided to teachers.

We focus on these elements from Zaslow and colleagues (U.S. Department of Education, 2010) as we believe they, along with NIEER professional development benchmarks, are a way to more fully understand whether professional development activities are likely to be effective at changing or strengthening teacher practices and subsequently child outcomes. Later in this report, we will return to these elements as a way to gauge how well current CERDEP professional development opportunities align with the six features.

Professional Development Requirements in State-Funded 4K Programs Systems

NIEER's survey of state 4K programs report that nearly all existing programs require lead and assistant teachers to complete some amount of in-service professional development. In Table 3.1, we present data on the professional development requirements in a sample of state-funded 4K programs in South Carolina and nine other states. The features we highlight in this table are guided by four key components of an early childhood professional development systems described in chapter one (Karoly, 2012). We report on the number of required hours of professional development in addition to whether the states' requirements meet NIEER's staff professional development benchmark standards.

We also document whether the states surveyed have an ECE workforce registry. An ECE workforce registry is a key data system that can contribute to a comprehensive state professional development system (Karoly, 2012). Such workforce registries often track teachers' education levels, credential attainment, and degree completion. Registries that include data from multiple early learning agencies, including public and private centers, is one way states and localities track professional development and determine whether teachers or other ECE staff meet professional development or workforce requirements (U.S. Department of Health and Human Services and U.S. Department of Education, 2016). In some states, workforce registry information is linked to other sources of ECE data, such as data on children's health and development (King et al., 2018). In 2018, King and colleagues (2018) conducted a nationwide

Table 3.1. Teacher Professional Development Requirements and Features in State-Funded 4K Programs

State Program	Hours of PD Required for Lead Teachers	Hours of PD Required for Assistant Teachers	Meets NIEER Standard	ECE Workforce Registry
Alabama First Class Pre-K	30 hours per year	20 hours per year	✓	Yes
Florida Voluntary Prekindergarten Program	10 hours per year	Not reported		Yes
Georgia Preschool Program	15 hours per year	15 hours per year	✓	Yes
Kentucky Preschool Program	24 hours per year	18 hours per year		Yes
Mississippi Early Learning Collaborative	15 hours per year	15 hours per year		No
North Carolina Pre-K Program	80 hours over 5 years	6 credit hours over 5 years		Yes
South Carolina CERDEP	15 hours per year	15 hours per year	✓	No
Tennessee Voluntary Pre-K	18 hours per year	12 hours per year		No
Virginia Preschool Initiative (VPI)	15 hours per year	Varies by locale		Yes
West Virginia Universal Pre-K	15 hours per year	15 hours per year		Yes

SOURCE: Friedman-Krauss et al., 2018; National Workforce Registry Alliance, undated; Early Childhood Data Collaborative, undated.
NOTES: PD = professional development.

survey to understand the current status of early childhood data systems. The authors found that the majority of states collect some sort of data in a workforce registry.

CERDEP policies mandate that all lead teachers and instructional assistants complete 15 hours of professional development per year. As shown in Table 3.1, CERDEP's 15 hour–per year requirement for lead teacher professional development is on par with many other states. Only the programs in Kentucky, Alabama, and Tennessee require that lead teachers complete more than 15 hours per year. The ten programs reviewed here vary in whether assistant teachers are required to complete the same or fewer hours than lead teachers. Georgia, Mississippi, and West Virginia are like South Carolina, in that assistant teachers are held to the same expectation as lead teachers, while in North Carolina, Kentucky, and Alabama, assistant teachers are required to complete fewer hours. CERDEP is one of only three state programs we reviewed that meets NIEER's staff professional development benchmark standard (as reported in NIEER's report on the 2016–2017 school year). In the sections that follow, we detail which opportunities allowed teachers to meet this requirement. Almost all of the states we reviewed use a workforce registry to track teacher education and credentials, professional development offerings, and professional

development participation, though the quality of the registries are unknown to the authors. South Carolina is among only three states in this set of ten states without this kind of data system.

Professional Development in the Georgia PreK Program

To further illustrate how other state preK programs provide professional development to staff, we conducted a more in-depth review of one program, the Georgia PreK program. We selected Georgia, in part because of its proximity to South Carolina. In addition, Georgia's program is one of the oldest universal state-funded 4K programs in the country, and is often held up as an exemplar (Friedman-Krauss et al., 2018). Georgia Pre-K is delivered across a number of different settings, including public schools, private childcare centers, faith-based organizations, Head Start agencies, state colleges and universities, and military facilities. The program is administered by Bright from the Start: Georgia Department of Early Care and Learning (DECAL). The Georgia program is free to all age eligible 4-year-old children in their year before kindergarten. Teacher professional development is a hallmark of Georgia's 4K program. As described in Table 3.1, all 4K teachers (leads and assistants) are required to complete 15 hours of professional development in each calendar year. In addition, all teachers are required to write and follow an individualized professional development plan and receive individualized coaching throughout the school year. Because of these features, the state meets NIEER's benchmark requirements for staff professional development.

Georgia's preK program has taken advantage of resources in the state professional development system to ensure that teachers have access to a number of different professional development opportunities to meet these requirements. In 2010, Georgia was awarded a $400 million federal Race to the Top grant to improve the educational outcomes of all children across the state. The state allocated a portion of these funds to DECAL to improve and evaluate professional development efforts in the state's ECE settings. Since then, DECAL has used these and other Georgia Pre-K funds to implement and test many professional development models for its preK teachers. A 2014 evaluation report describes two different models used in the state—Making the Most of Classroom Interactions (MMCI) and My Teaching Partner™ (MTP) (Early et al., 2014). Both models are designed to be used with the Classroom Assessment Scoring System™ (CLASS), an observation tool focused on promoting high-quality teacher-child interaction. MMCI is an in-person professional development program in which groups of teachers meet with an instructor over ten two-and-a-half-hour sessions and learn to identify and analyze teacher-child interactions and discuss ways to promote student learning. By contrast, MTP is a remote professional development model, in which teachers work with a coach via conference calls and web communication. Teachers record videos of themselves interacting with their students; the coach then reviews the video and provides detailed feedback to teachers in multiple rounds of discussion and communication.

The evaluation of these interventions showed that the Georgia preK teachers who participated in MTP and MMCI showed improvements in their classroom practices compared

with teachers who did not, with MMCI teachers showing more gains (Early et al., 2014). A 2017 report indicated that DECAL has continued to use these models as a key component of the state's professional development offerings for some preK teachers. Usage of these well-defined and research-based professional development interventions is one way that Georgia's professional development system ensures outreach and access to high-quality training experiences for its preK teachers.

In addition to the coaching models described earlier, DECAL and other local organizations administer in-person and virtual professional development workshops throughout the year. To facilitate additional learning, DECAL launched the Online Library Learning Initiative (OLLI), "a virtual warehouse of online learning modules and video podcasts designed specifically for the Early Learning Community teaching children from birth to age five" (Georgia Department of Early Care and Learning, 2019). OLLI is intended to offer more flexibility to educators in how they access professional development. If a practitioner is unable to attend an in-person training, a functioning internet connection will allow them to access OLLI's resources.

DECAL also makes use of an ECE workforce. The Georgia Professional Development System (GaPDS) is Georgia's state-level ECE workforce registry. It is designed specifically for educators who work "directly with young children or on their behalf" (Georgia Department of Early Care and Learning, 2018). Georgia Pre-K teachers, as well as other ECE practitioners in the state, use GaPDS as a comprehensive system for all their professional development tracking needs. ECE professionals can create a profile that stores their education and training credentials (e.g., preservice degrees) and tracks their in-service professional development training. GaPDS also serves as a registry of DECAL-sponsored trainings. Through one common portal, teachers can search and register for trainings to meet professional development requirements. In addition, GaPDS can be used as a data source to track state-level trends in ECE-related professional development. Stakeholders can use the system to monitor how much training educators take and trends in the trainings offered and attended.

CERDEP Professional Development Requirements and Offerings

CERDEP legislation outlines professional development requirements for 4K lead teachers and instructional assistants in both private providers and public school districts.[13] As described in Chapter 1, all CERDEP providers are required to be certified by the Department of Social Services (DSS). DSS requires that all teachers in certified centers receive 15 hours per year of professional development. CERDEP guidelines mirror this requirement. The same 15 hours of training fulfill both the DSS and CERDEP professional development requirements for CERDEP teachers. Both CERDEP and DSS guidelines mandate that teachers' professional development

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[13] CERDEP legislation also requires preschool directors receive professional development training (20 hours annually). Because the focus of this report is on teachers, we do not include information on training required or what opportunities are offered to directors.

hours fall within the following domains (SCDE, 2018b; South Carolina Department of Social Services, 2018a):

- child growth and development
- curriculum
- teaching children from poverty
- teaching emergent literacy
- child health and safety, and nutrition
- special needs, program administration or other DSS-approved area
- blood-borne pathogen training.

First Steps and SCDE submit a CERDEP report to the EOC on an annual basis, detailing the state of the program. In these reports, both detailed that 100 percent of CERDEP teachers in both public and private settings met the professional development requirements. In the following section, we detail the opportunities that were provided to teachers in both public school districts and private providers to meet their required professional development hours in the 2017–2018 school year. In each case, we focus on the three categories of professional development opportunities reviewed earlier: non–credit-bearing workshops and trainings, coaching and mentoring, and credit-bearing courses.

Professional Development Offerings for CERDEP Teachers in Public School Districts

Workshops and Trainings

For CERDEP teachers in public school districts, OELL provides various PLOs to educators throughout the school year. In the 2017–2018 school year, opportunities were provided regionally, allowing personnel from school districts throughout the state to attend trainings and workshops that were most convenient to them. PLOs are structured around the *Learning Forward: Standards for Professional Learning* (SCDE, 2018a). The Learning Forward standards include seven components to promote effective professional development opportunities, including: learning communities, resources, learning designs, outcomes, leadership, data, and implementation (Learning Forward, undated). OELL used these standards to help design its PLOs.

In the 2017–2018 school year, OELL provided more than 30 professional development opportunities. Based on SCDE's annual report to the EOC, these opportunities amounted to "approximately 195 hours" of training (SCDE, 2018a, p. 14). These opportunities primarily took the form of workshops and courses. Topics included preschool curricula, child and classroom assessments, literacy skills, creating language and literacy-rich environments, states' early learning standards, family engagement, and other topics. These courses were spread out across the school year, occurring in the fall, spring, and summer. Additionally, in school year 2017–

2018, OELL provided train-the-trainer workshops on the South Carolina Early Learning Standards to school district staff.[14] The district leaders then were able to take the training back to CERDEP personnel in local school districts. OELL also offered online trainings to public CERDEP teachers. A notable example is the 14-module Early Learning Language and Literacy provided through the U.S. Department of Education Preschool Development Grants Technical Assistance Office (Preschool Development Grants, undated). Completing all 14 modules resulted in participants earning 42 approved professional development hours.

PLOs also extended into the summer following the 2017–2018 school year. In summer 2018, the OELL provided intensive, two-day trainings on early literacy and learning research and best practices. CERDEP personnel that participated in the same research and best practices summer 2017 training could attend a follow-up two-day training in summer 2018 on how to use data to inform practice and improve academic achievement.

Given the number and hours of PLO's OELL offered, a teacher in a public setting could have easily fulfilled the 15-hour requirement by attending a subset of these offerings. In addition to the professional development learning opportunities offered by OELL, school districts had the freedom to provide workshops or trainings to CERDEP teachers they employed. Indeed, districts had a great deal of local control in regard to the professional development they offer their teachers. OELL reported that district specific trainings in 2017–2018 included topics in reading, writing, math, social and emotional development, preschool curricula, child assessments, behavior management, and early learning standards, among others. It is likely that variation existed in the nature of these professional development opportunities across districts. However, in the absence of specific, systematically collected information about these opportunities, it is not possible to detail how professional development opportunities for CERDEP teachers differed from one district to another.

Coaching and Mentoring

OELL was responsible for conducting annual quality monitoring visits to CERDEP classrooms in 2017–2018 school year. These visits offered an opportunity for CERDEP teachers to receive coaching and mentoring. The quality monitoring visits were conducted by SCDE-employed early learning specialists with expertise in ECE and literacy development. In the 2017–2018 school year, there were three specialists employed by OELL and tasked with conducting monitoring visits. During the visits, the early learning specialists conducted a classroom observation using the Early Language and Literacy Classroom Observation (ELLCO), a classroom observation tool designed to measure the quality of the language and literacy environment and instructional practices in ECE classrooms. The specialist also checked for compliance with CERDEP regulations, such as usage of CERDEP-approved curricula. Following

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[14] See Appendix A for a description of the state's early learning standards.

the classroom observations, the early literacy specialist held a coaching conference with the lead teacher and, when available, the assistant teacher, a district-level early childhood coordinator,[15] another school administrator (e.g., the principal), or some combination thereof. In addition, all South Carolina public elementary schools employed a literacy coach. When possible, the literacy coach was asked to join these conferences.

OELL key informants reported that during the coaching conferences, the literacy specialist reviewed the results of the ELLCO, highlighting areas of strength and weakness. The specialist used a SCDE-developed coaching worksheet to support teachers in developing goals for improving their classroom practice based on the observation results. OELL intended for the district early childhood coordinator, school literacy coach, or both to continue working with individual teachers on meeting these goals throughout the year. However, outside of the monitoring visit, no other mandated coaching or mentoring sessions or supports were part of the CERDEP program. SCDE reported that in the 2017–2018 school year, OELL made monitoring visits to approximately 40 percent of CERDEP classrooms (SCDE, 2018a). New classrooms and classrooms in districts that were part of the state Supreme Court case that led to CERDEP's establishment were given priority. In addition, it is likely that school-level literacy coaches served some CERDEP teachers; however, no systematic data exist to document the extent or degree of coaching received.

Credit-Bearing Courses

Based on our review, credit-bearing courses were not part of the official professional development offerings by OELL or the districts in the 2017–2018 school year. However, teachers have the freedom to enroll in credit-bearing courses at a college, university, or other postsecondary education and training institution. Because all CERDEP teachers in public districts have a BA, any enrollment in credit-bearing courses was likely connected the pursuit of a graduate degree, or some other post-baccalaureate credential, certificate, or course.

Professional Development Offerings for CERDEP Teachers in Private Providers

We now detail the professional development opportunities offered to CERDEP teachers in private centers, again differentiating between the three categories of professional development opportunities.

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[15] Some CERDEP districts have a position called an early childhood coordinator who acts as an administrator managing CERDEP classrooms across multiple sites and schools within a district. See Karoly and Gomez (2019) for more information on the role.

Workshops and Trainings

First Steps provides professional development opportunities for CERDEP teachers employed by private providers.[16] In the 2017–2018 school year, these opportunities primarily took the form of one-time workshops and courses. At the beginning of the school year, First Steps organized a four-day academy for all 4K teachers. The academy covered such topics as preschool curriculum, language and literacy, child assessments (e.g., B3–GOLD), lesson planning, social and emotional development, parent engagement, the South Carolina Early Learning Standards, and classroom management. Additionally, prior to the all-teacher academy, First Steps provided a three-day new teacher academy where new CERDEP teachers could learn more about First Steps, including expectations, various child care or preschool programs, and preschool curricula. In total, new teachers received seven full days of training (7.5 hours each day) prior to the start of the new school year. Key informants reported that for most private CERDEP providers, the majority of required professional development hours were earned during the academies.

In addition to the teacher academies, First Steps provided professional development workshops throughout the school year. Trainings were coordinated by First Steps' 13 regional coordinators. The regional coordinators are administrators who work with providers in designated regions of the state to ensure compliance with CERDEP regulations and to support program quality. During the 2017–2018 school year, four regional training days were offered at locations across the state. These trainings focused on classroom observations, Creative Curriculum implementation,[17] and summer literacy activities. The regional coordinators also plan other region-specific trainings throughout the year as needed. As described in more detail in a later section, all First Steps workshops are certified by DSS via the state-level professional development tracking system.[18]

First Steps also offered financial support to some private teachers and directors to attend the annual conferences of the South Carolina Early Childhood Association and the South Carolina Association for the Education of Young Children. During the two-day conferences, a number of trainings were offered, many of which can count toward the annual required 15 hours.

Finally, the directors at private CERDEP providers may have also offered professional development for the staff at their centers. First Steps did not collect data on the extent to which directors offer trainings, or how much teachers take advantage of them. However, key informants indicated that most private providers relied primarily on First Steps' state and regional offerings.

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[16] Workshops and training opportunities are provided to preschool directors; however, we do not cover that information here, as our focus is on preschool teachers.

[17] Creative Curriculum is one of the approved curricula CERDEP providers can employ in their classrooms (see Appendix A for more detail).

[18] In addition, teachers who do have a state-level SCDE teaching certification can use the hours earned at the summer academy to maintain their certification through renewal credit hours.

Coaching and Mentoring

First Steps regional coordinators were responsible for conducting quality monitoring visits and coaching sessions with private CERDEP providers. The regional coordinators aimed to visit each CERDEP provider twice a month for approximately one to two hours, but up to seven hours if needed. Depending on the regional coordinator case load and providers' needs, the frequency and length of visits may have varied. During these visits, the regional coordinators provided coaching and mentoring using a range of different techniques, including conducting classroom observations, providing feedback on teachers' instructional practices, modeling instructional techniques, and troubleshooting concerns in the classrooms.

Beginning with the 2017–2018 school year, First Steps developed and adopted the Building Learner Outcomes through Opportunities and Models (BLOOM) plan, a framework to guide the coaching sessions with private CERDEP providers. As part of BLOOM, regional coordinators worked with teachers to conduct observations and self-assessments, set goals, and provide reflection time. Regional coordinators applied the BLOOM model during the bimonthly visits to CERDEP providers. Sessions during these visits focused on specific areas, such as curriculum implementation or self-regulation skills. As part of the process, teachers created "growth and development" plans. These plans included three goals in specific, predetermined areas of development. In 2017–2018, the three areas were *Creative Curriculum* implementation, classroom environment, and development of social emotional skills utilizing *Conscious Discipline*, an evidence-based behavior management and social emotional learning approach. Over the course of the year, teachers, along with their regional coordinators, tracked their progress toward their goals. BLOOM provided a more intensive, defined set of activities for regional coordinators to use during their visits with CERDEP providers.

Credit-Bearing Courses

Based on our review, credit-bearing courses were not part of the official professional development offerings provided by First Steps. However, as described in Chapter 2, all teachers employed by CERDEP private providers who do not have a BA must be enrolled in a university program working toward a four-year degree. Our analyses suggest that 36 percent of CERDEP teachers in private settings in the 2017–2018 school year did not have a BA. Given the policy, some of these teachers may have been enrolled in credit-bearing coursework as they worked toward a four-year degree. First Steps regional coordinators keep record of the postsecondary progress teachers with an AA make toward their four-year degree. However, in the 2017–2018 school year, these data were not stored centrally, and were not used to document which teachers were enrolled in coursework, or what sort of courses they were engaged in.

Comparing Professional Development Opportunities for Public and Private CERDEP Providers

As noted, CERDEP is administered and implemented by two separate entities, SCDE and First Steps. Based on our review, the professional development opportunities offered to public providers by SCDE and to private providers by First Steps in the 2017–2018 school year were also largely delivered separately. First Steps and SCDE did not collaborate at a systems level to consistently offer joint or shared professional development opportunities for providers from the two different settings. Despite the lack of systematic coordination, there were some opportunities for educators from private and public settings to receive joint training. For example, First Steps extended invitations to some CERDEP districts to send teachers from the public schools to the First Steps summer academy. In addition, SCDE ran trainings on the *Teaching Strategies GOLD* products (including B3–GOLD) that teachers from private providers and public school districts may have attended together. Key informants also indicated that teachers from both settings attended statewide conferences for ECE practitioners; the trainings at these conferences offered an opportunity for educators from different settings to learn together.

In addition, there is evidence of some local, city-, county- or district-wide initiatives that fostered collaboration and shared professional development among the private and public CERDEP providers. For example, the South Carolina General Assembly provided competitive block grants to school districts through the South Carolina Community Block Grants for Education Pilot Program. The grants could have been used for developing professional development activities, implementing evidence-based interventions and innovative practices, or both (South Carolina Education Oversight Committee, 2017). The grants encouraged school districts to collaborate with private preschool providers, and were awarded based on a competitive process managed by the EOC.

As an example, in fiscal years 2015–2016 and 2016–2017, the EOC awarded funds to the Spartanburg Consortia, comprised of two school districts (Spartanburg 3 and Spartanburg 7); the Spartanburg Academic Movement, a local educational nonprofit; and Spartanburg County First Steps (the local chapter of the statewide First Steps). Among the goals of the Spartanburg Consortia was to create a partnership between the districts and Spartanburg County First Steps, and to foster a shared professional development and quality monitoring system between the public and private 4K settings in the county (D'Amico et al., 2018). However, our review suggests that few of the other grants awarded through the General Assembly funding mechanism were used to establish shared professional development opportunities between public and private CERDEP providers.

Given that the large majority of teachers in public and private settings likely do not experience any shared professional development, it is useful to compare and contrast the experience of educators across the two settings. We focus again on the three main forms of professional development discussed—workshops, coaching, and credit-bearing courses—as well

as the primary organizations offering the professional development. Table 3.2 presents a summary of this comparison and rest of the section describes these in more detail.

Workshops and Training

Our review indicates that, like most ECE settings, both OELL and First Steps offered a number of discrete workshop-style trainings. OELL offered trainings throughout the year; First Steps front-loads its trainings during the week-long teacher academy, and offers regional professional trainings throughout the year. Teachers in both public and private settings had access to trainings on a range of overlapping topics; both OELL and First Steps focused on supporting educators' ability to implement high-quality language and literacy practices, while also addressing other such topics as health and safety and parent engagement. That said, it is not clear how consistent the content or its delivery is across trainings. To our knowledge, no clear established guidance is provided on what content must be covered beyond the topic areas listed in the CERDEP and DSS licensure legislation (e.g., child growth and development, health and safety). Similarly, no guidance is available at the state level on how or when trainings or workshops should be delivered. For example, a CERDEP teacher in a private center may have received all health and safety trainings during the First Steps teacher academy to satisfy the requirement, whereas a public CERDEP provider teacher may have received trainings in that domain throughout the school year. This type of variation in content, timing, and delivery mechanisms also existed between local school districts, private providers, and even between individual teachers.

Table 3.2. Summary of Professional Development Offerings for Public and Private CERDEP Providers

Professional Development Features	Public School Districts	Private Providers
Primary organizations offering professional development	• OELL • Individual districts • State ECE conferences	• First Steps • State ECE conferences
Workshops and trainings	• Offered throughout the year on many topics	• Offered throughout the year on many topics
Coaching and mentoring	• Coaching offered; focused on the ELLCO • OELL offered coaching once annually to some staff only • Access to school-based literacy coaches	• Coaching offered; used BLOOM framework • First Steps offered twice monthly
Credit-bearing courses	• Not officially part of offerings	• Not officially part of offerings • An estimated 36 percent of lead teachers are working toward a four-year university degree

SOURCE: Authors' analysis of CERDEP documents and key informant interviews.

Our review suggests that there may have been more variation in the training and workshop experiences among teachers in public settings as compared with teachers in private settings. OELL informants indicated the districts had a great deal of local control and administered many district-specific trainings for their educators. While SCDE also administered statewide and regional trainings for educators, teachers' district-specific experiences may have differed across locales. By contrast, teachers from different private providers may have experienced more consistent professional development opportunities, given that First Steps' offerings were fairly standardized (e.g., one annual summer academy for all teachers and standard regional professional development days). While individual private providers may have offered additional trainings to their teachers, this was not common practice. However, even with the standard First Steps offerings, teachers had the freedom to select specific opportunities (for example, not all teachers attended all of the same sessions at the summer academy); thus, there was certainly variation in the professional development experiences of teachers in private settings as well.

Coaching and Mentoring

Both private and public CERDEP providers had access to coaching and mentoring opportunities, but models differed across settings. Staff from OELL and First Steps engaged in quality monitoring and coaching visits with public and private providers, respectively. In public settings, the OELL coaching visits were guided by a language and literacy classrooms observation tool and focused on creating plans and goals to improve teachers' practice. The visits happened once annually, and not all classrooms received a visit in the 2017–2018 school year. All public schools also employed literacy coaches who may have worked with CERDEP teachers on their classroom practice. In the private setting, First Steps regional coordinators used the BLOOM model to support coaching visits for private providers, focused on goal-setting and reflective practice. First Steps visits were intended to take place twice monthly, though this desired dosage may not have been achieved consistently. As such, the prescribed coaching visits are higher for teachers in private settings than in public settings. However, teachers in public settings may have had access to school-based literacy coaches who may have provided continued support.

Note that due to a lack of data, it is not clear whether 100 percent of teachers received coaching services. For example, in public settings, 40 percent of classrooms received coaching visits, but some teachers may have received additional coaching services from district-based literacy coaches. In the most recent annual preschool report for the 2016–2017 school year, NIEER indicated that CERDEP, as a program, met the benchmark requirement for staff professional development, meaning teachers were required to complete 15 hours of professional development, some of which required coaching and mentoring. In addition, teachers must have had an individual professional development plan. We believe that South Carolina was designated as meeting this standard because of the coaching services provided. However, our review

suggests that some CERDEP teachers' professional development experiences may not have met this benchmark in the 2017–2018 school year.

Credit-Bearing Courses

Neither SCDE nor First Steps included credit-bearing courses as an official component of their professional development offerings in the 2017–2018 school year. Thirty-six percent of teachers in private settings had not yet earned a BA, and were required to show documentation that they were making progress toward a four-year college or university degree. All teachers in public settings had earned a BA, and thus were not held to this requirement. This contrast suggests that a higher percentage of teachers in private settings may have been enrolled in credit-bearing courses; however, there is no available data to confirm this hypothesis.

Professional Development Tracking and Documentation in CERDEP

While South Carolina does not have an ECE workforce registry that tracks teacher education levels and employment, the statewide CCCCD is mandated by the state to track teachers' participation in professional development opportunities. CCCCD is a statewide organization that manages and tracks professional development opportunities for all DSS-licensed child care providers in the state, including (but not limited to) CERDEP providers. CCCCD's primary role is to certify trainers, register and approve trainings, keep a calendar of registered trainings that are submitted to CCCCD, and administer a system that allows teachers to track their participation in approved trainings. CCCCD provides some professional development for trainers, some of whom may be child care providers; but CCCCD generally does not provide professional development targeted to child care teachers (CERDEP teachers or teachers in other ECE settings). CCCCD also tracks teachers' receipt of state-specific South Carolina ECE credentials.

To meet the CERDEP- and DSS-required 15 hours per year of professional development, it is up to each individual teacher to track their hours and ensure sufficient documentation. CCCCD has an online transcript system that tracks teachers' participation in trainings. In order for a professional development or learning opportunity to count toward the CERDEP and DSS 15-hour requirements, workshops or training sessions must be approved by CCCCD (SCDE, undated-a). CCCCD registers and approves trainings that take a variety of different forms, including in-person trainings, conference sessions, online trainings, college courses, webinars, and specialized or out-of-state trainings. Typically, CCCCD reviews and approves trainings in one of two ways. First, a certified trainer can submit a workshop or course proposal to CCCCD.[19] During the review process, CCCCD ensures that the professional development

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[19] Certified trainers are individuals who have met CCCCD's educational and experience requirements to be a trainer and have completed the certification process, which includes an application to verify their experience.

activity content meets DSS requirements (e.g., the workshop or course covers content areas required for DSS licensure). The OELL and First Steps workshops described earlier are typically administered by certified trainers and sent to CCCCD for approval prior to the training. At these certified trainings, attendance sheets are collected and submitted directly to CCCCD following the training. All attendees are then logged in the online system as having participated in the training. Similarly, the trainings offered at statewide early childhood conferences are also preapproved by CCCCD. An electronic bar code, or "sticker" system, is used to track and record teachers' participation at individual sessions.

Individual teachers can also submit professional development activities they engaged in, outside of OELL or First Steps workshops, to CCCCD for approval. For example, a teacher who attends an out-of-state conference can complete the CCCCD review process, which requires submitting documentation of the training content and proof of completion. If the training is approved, CCCCD's system will log the teacher's participation.

CCCCD provides an online portal for teachers to download their personal transcripts, in which they track the trainings they attended and the number of professional hours they completed in a given calendar year. The transcript also provides documentation of hours completed over time, with tracking going back to 2002. CCCCD only tracks professional development attendance that is submitted by teachers, trainers, or training companies. If a teacher reaches his or her 15 hours via OELL or SCDE preapproved trainings, he or she may or may not submit other trainings or workshops that he or she attended to be tracked through CCCCD's system. Teachers are not required to submit all professional development activities in which they participate. That is, CCCCD's system serves a mechanism through which teachers can demonstrate that they have met the CERDEP and DSS professional development requirements, but it is not necessarily a comprehensive record of all the professional development activities that teachers complete.

CCCCD does not actively monitor teachers' training records. So, if a teacher does not complete the required 15 hours, the system does not issue a warning or alert an administrator. Rather, teachers are responsible for printing their transcript as proof of their training hours, and storing the transcripts so their local administrators can show DSS and CERDEP compliance to licensing monitors and other stakeholders. (DSS licensing monitors can also view employee transcripts when completing compliance visits.) Indeed, the database is designed to facilitate the production of these transcripts, but is not designed for large-scale analysis. With the current professional development tracking system, CCCCD staff can run global reports on such topics as the number teachers who attended trainings within a given year, or how many trainings were offered.

CERDEP Professional Development and Best Practices in the Field

We now turn back to the earlier review of best practices in professional development for ECE practitioners. How do CERDEP's professional development opportunities from the 2017–2018 school year compare with features articulated by Zaslow and colleagues (U.S. Department of Education, 2010)? Table 3.3 summarizes the degrees to which CERDEP's professional development opportunities do or do not meet these features. We list each of the features and provide a brief discussion of how CERDEP opportunities measure up, based on the available information.

Professional development opportunities are content- or instructionally specific. Based on our review, CERDEP professional development opportunities were intended to be content- and instructionally specific. We reviewed descriptions of available professional development sessions, most of which had a specific content focus. In addition, CCCCD's review process for professional development opportunities requires that training courses focus on the topic areas identified in the CERDEP legislation. However, there was no comprehensive database with detailed information—e.g., goals, objectives, materials—on all CERDEP professional development offerings across both private and public settings. In the absence of observing professional development opportunities, or reviewing materials used in the trainings, it is not possible to determine whether the sessions were focused and instructionally specific.

Table 3.3. Summary of CERDEP's Alignment with Best Practices in Professional Development

Professional Development Feature	Met by CERDEP
Professional development opportunities are content- or instructionally specific	Unable to determine
Teachers are provided with individualized training or coaching	Met
Teachers within the same classroom or center participate in the same professional development opportunities	Likely met
Intensity and duration of opportunities matter, and should be aligned with professional development goals	Somewhat met
Professional development opportunities are aligned with educators' ability to conduct child assessments in the appropriate domains	Met
State or other organizational standards should be considered when designing professional development opportunities	Somewhat met

SOURCE: U.S. Department of Education (2010); authors' analysis of CERDEP documents and key informant interviews.

Teachers are provided with individualized training or coaching. Teachers in both public and private CERDEP settings had the opportunity to receive individualized coaching, though the coaching model and dosage differed between private and public settings.

Teachers within the same classroom or center participate in the same professional development opportunities. Based on our review, CERDEP trainings were not necessarily designed to ensure that teachers from the same classroom, center, or school attend the same trainings. Indeed, individual teachers were able to meet their 15-hour requirement however they wished. However, given that many of the OELL and First Steps trainings were region- or district-specific, it is likely that teachers from the same providers or school attended many of the same trainings.

Intensity and duration of opportunities matter and should be aligned with professional development goals. CERDEP coaching opportunities may be one way in which individual professional development opportunities were designed to match teachers' needs and goals through sustained mentorship and support. Zaslow and colleagues (U.S. Department of Education, 2010) also indicate that sustained, intensive professional development sessions, as opposed to short, individual workshops sessions, tend to be more effective in changing teacher practice. Our review suggests that some workshops offered to CERDEP teachers fell into the latter category; these trainings may not follow best practices. As such, some of CERDEP's professional development opportunities met this practice, and some did not.

Professional development opportunities are aligned with educators' ability to conduct child assessments in the appropriate domains. Both OELL and First Steps offered a number of trainings focused exclusively on building educators' skills to conduct child assessments.

State or other organizational standards should be considered when designing professional development opportunities. CERDEP legislation offers a set of topics on which CERDEP professional development must focus. In addition, CCCCD's review and approval process ensures that all trainings meet established standards. However, our review indicates that there was likely large variation in the professional development experiences of teachers in private and public settings. Without more systematic data on the specific professional development opportunities teachers are engaged in, it is difficult to determine how variable professional development experiences were across teachers. More consistency across trainings would ensure that all teachers are receiving similar messages and building similar competences. As such, standards were used when designing CERDEP professional development opportunities, meeting the best practice, but more consistency across CERDEP trainings is needed.

4. Key Findings and Policy Recommendations

CERDEP is one South Carolina's largest investments in supporting the development of low-income children. To maximize this investment, it is critical that the educators who make up the CERDEP workforce build and maintain the skills needed to promote children's learning. Effective professional development for CERDEP teachers is one way to achieve this goal. In this report, we analyzed two aspects of teachers' professional development experiences: (1) teachers' preservice education levels, and (2) in-service professional development opportunities. In this final chapter, we review key findings from our analysis and present policy recommendations for CERDEP stakeholders.

Key Findings

Teacher Education Levels and Child Outcomes

We found that approximately two-thirds of CERDEP teachers in private providers had a BA or higher in the 2017–2018 school year. Despite the fact that only an AA was required, most teachers in private CERDEP providers had completed a four-year college degree. The remaining 36 percent of teachers who reported having an AA were required to be enrolled in a four-year college degree program. At the provider level, some or all CERDEP teachers had a BA at 64 percent of the centers; 70 percent of CERDEP children were served by these providers. When looking across all CERDEP children in both private and public settings, we estimate that approximately 94 percent of children were taught by a BA-level teacher.

We conducted statistical analyses to explore whether children who attended providers where all teachers had a BA were more likely to meet or exceed age-level expectations on the B3–GOLD end of year assessment compared with children who attended a provider where only some or no teachers had a BA, controlling for key child and CERDEP provider characteristics. We found no evidence of any differences in children's B3–GOLD scores based on teachers' levels of education. That is, all children, regardless of the share of teachers in the provider who had a BA, were equally likely to meet or exceed age-level expectations at the end of 4K.

Comparing Professional Development Offerings for Teachers in Private Providers and Public School Districts

Both SCDE and First Steps reported that, in the 2017–2018 school year, 100 percent of CERDEP teachers met the 15 hours per year professional development requirement. Teachers in both private and public CERDEP settings had access to a number of different professional development opportunities to meet this requirement. OELL and First Steps offer separate

professional development opportunities to teachers in the two settings, with few opportunities for the teachers in the two settings to engage in shared learning opportunities.

Both teachers in public school districts and private providers had access to many workshops and trainings throughout the year on a range of different topics, including the development of children's language and literacy skills, implementing child assessments, the South Carolina Early Learning Standards, and ECE curriculum. Workshops and trainings represented the bulk of the professional development opportunities that First Steps and OELL offered. It is likely that most teachers in private providers received the majority of their professional development from state- or region-wide First Steps workshops. By contrast, teachers from public school districts likely took part in both statewide OELL trainings as well as local district- or school-specific workshops.

Both OELL and First Steps included opportunities for teachers to receive coaching, though the coaching models and dosage differed across the two settings. Credit-bearing courses were not the focus of either OELL's or First Steps' offerings.

Professional Development Tracking and Data

CCCCD provides the primary systems by which CERDEP teachers track their participation in professional development. The online system allows teachers to record participation in CCCCD-approved training and print out individual transcripts to document their professional development hours. The system does not function as a workforce registry, and therefore does not store information on teacher education (beyond state-specific ECE credentials) or employment. In addition, the database was primarily designed to produce teacher transcripts and is not used to track trends in professional development take-up across CERDEP settings.

CERDEP and Best Practices in Professional Development

Our review suggests that CERDEP's professional development offerings met some but not all best practices for ECE professional development. For example, CERDEP teachers had access to coaching services and trainings that focused on implementing child assessments. In addition, teachers from the same classroom, provider, or school were likely to attend similar trainings. However, it was not possible to determine from the available documentation the extent to which CERDEP trainings are instructionally specific, a feature of effective ECE professional development. Best practices also suggest that sustained, long-term professional development is more likely to lead to changes in teacher practices than the standalone workshops characteristic of some CERDEP professional development.

Policy Recommendations and Considerations

Given these findings, we make several policy recommendations to CERDEP stakeholders. For each recommendation, we note the key policy considerations, focusing on how they relate to

an ECE workforce professional development system—the compilation of the organizations, services, infrastructure, and supports that help to ensure that members of the ECE workforce develop and maintain their skills. In Chapter 1, we framed this study with a discussion of the four key components of an effective ECE workforce professional development system: (1) attention toward defining competencies, establishing teachers' credentials, and developing a career ladder; (2) outreach and access to professional development opportunities; (3) data systems and other infrastructure supports; and (4) financial incentives and resources (Karoly, 2012). A complete review of the components of South Carolina's ECE workforce professional-development system was outside of the scope of this report. However, our review of teacher education and professional development opportunities available to CERDEP teachers and the recommendations that follow are relevant for advancing several of the key features of a statewide ECE workforce professional development system. Broadly, we recommend that CERDEP leaders and other ECE stakeholders continue to build and strengthen the existing system components; indeed, each of the recommendations that follows addresses a different aspect of an effective professional development system.

Recommendation 1: Convene CERDEP stakeholders to discuss teacher education requirements.

SCDE and First Steps should hold one or more convenings with key CERDEP stakeholders to discuss teacher education requirements and the potential advantages and drawbacks of raising the requirement to a BA for all teachers, in both public and private settings. Discussions should take into account that, in the 2017–2018 school year, the majority of teachers in private settings had already earned a BA, 70 percent of children served in private settings attended a provider where at least one teacher had a BA, and over 90 percent of all CERDEP children (in both private and public settings) had a teacher with a four-year college degree. Stakeholders should consider that when looking across the literature and the findings presented here, there is little rigorous evidence to suggest a relationship between teacher education and child outcomes. However, it is also important to consider the current movement in the field to professionalize the CERDEP workforce though increased education requirements.

Changing the teacher education requirement may have implications for multiple aspects of the ECE workforce professional development system. For example, if all teachers must earn a BA prior to working in CERDEP classrooms, there may be more demand for BA degree programs in the early childhood field. Institutions of higher education and workforce training programs must be prepared to train preservice teachers with clearly defined competencies and skills that the teachers must master, and must offer related degree programs.

The costs associated with changing the teacher education requirements should be considered as well. As indicated in our companion report (Karoly and Gomez, 2019), programs that require teachers to have a BA typically cost more, in part due to the higher teacher salaries required for more highly trained teachers. A BA requirement may also increase state-level costs for an ECE workforce professional development system, to the extent that the public sector subsidizes the

cost for the ECE workforce to acquire four-year degrees and the cost to maintain high-quality teacher preparation programs. CERDEP stakeholders must identify funding sources to make such a change sustainable.

In the meantime, or if the policy does not change, First Steps should consider tracking the postsecondary enrollment and degree attainment of teachers who enter the workforce with only an AA at a systems level. Currently, the information is stored locally with regional coordinators. This effort would allow program stakeholders to understand how long it takes teachers to earn a four-year degree and in what coursework they are engaged while serving CERDEP children. Tracking teachers' degree attainment could be done in a workforce registry (see recommendation 2).

Recommendation 2: Build on CCCCD's current database to establish a comprehensive statewide workforce registry system.

CCCCD offers the beginning of a comprehensive data system that can serve as a foundation for collecting more information on teacher education and professional development. A first step toward such a system would involve convening stakeholders from across the South Carolina ECE landscape to discuss the need for and goals of a potential statewide data system for all ECE providers. Stakeholders may consider designing a statewide workforce registry that tracks multiple teacher characteristics including teacher education levels, degrees and credentials, employment history, and teacher participation in in-service professional development including workshops, training, coaching, and credit-bearing courses. It is often effective to incentivize or require teachers to enroll in the system and record all professional development, not simply the activities that may count toward CERDEP and DSS requirements. In addition, designing the system in such a way that data stored within can be used from multiple purposes—such as verifying that teacher education and professional development requirements are met, and analyzing statewide trends in the workforce—will maximize the registry's utility. The registry can also act as a repository for thorough descriptions of professional development opportunities offered throughout the state, for indicating which offerings can count toward the annual requirement, and for certifying the trainers, coaches, and mentors who deliver them—similar to the functions CCCCD already serves. Establishing such a system would allow CERDEP and state preschool leaders to see where gaps may exist in professional development opportunities, to ensure teachers and directors are meeting education requirements, and to determine if certain patterns emerge around professional development, teacher or director education, or other key provider characteristics.

As described in the companion cost report (and in Appendixes A and C), CERDEP is not the only 4K or ECE program in the state. Implementing such a registry would require collaboration across all the state's ECE services and would be an important step toward creating a comprehensive data resource for the state. Indeed, key stakeholders from CCCCD indicated that it is in the middle of plans to create a statewide ECE registry that will store much of the data recommended here. An effective registry will meet the needs of and be appropriate for all ECE

providers, including but not limited to CERDEP providers. We recommend that the current leaders of the registry initiative take into account the needs of the full ECE landscape statewide as they build their system.

Finally, as is true for all recommendations, funding considerations must be addressed. National reviews of state and local ECE workforce registries suggest that locales access many different funding sources to support workforce registries, including federal dollars—e.g., the Child Care Development Funds Block Grants and funds from the U.S. Department of Education—as well as local dollars (National Center on Early Childhood Development, Teaching, and Learning, undated).

Recommendation 3: Provide more specific professional development guidelines to ensure that content is consistent and instructionally specific; develop a set of common competencies that all CERDEP teachers must master; offer more shared professional development offerings across private and public CERDEP providers to support teachers in building these competencies.

In order to ensure that providers are receiving consistent content, dosage, and intensity of professional development offerings, consider implementing more specific guidelines or requirements that specify exactly what a professional development activity should entail. For example, instead of providing broad professional development content areas in CERDEP legislation—e.g., child development and curricula in general—the state could require professional development in more specific areas, such as the CERDEP-approved ECE curricula, and require a specific dosage aligned with the importance or complexity of the topic.

The professional development guidelines should also include or be developed alongside a core set of skills and competencies that all CERDEP teachers need. Clearly defined competencies are a key component of a professional development system that will help ensure that all teachers have the skills need to be effective educators of young children. CERDEP professional development opportunities can then be designed around helping teachers develop and maintain these skills. While the literature suggests there are a number of skills that are likely important for all educators of young children (NASEM, 2015), public school districts and private providers are different settings that serve different populations of children with different needs. A one-size-fits-all professional development plan may not make sense for all teachers in all settings. CERDEP stakeholders may endeavor to identify high-level skills and competencies and professional development opportunities required for all teachers, while also providing flexibility and more specific requirements for teachers within particular settings. CCCCD currently works with South Carolina's technical colleges to offer ECE credentials to educators who complete predetermined courses on ECE topics. CERDEP and other ECE leaders may consider additional partnerships with institutions of higher education and other training organizations to ensure teachers have the opportunity to build these competencies and advance in the field.

Currently there is no publicly available repository that documents, in detail, the content and goals of the all the professional development opportunities offered to teachers. If CERDEP

continues to allow providers to count local trainings and non-OELL and non-First Steps opportunities toward professional development requirements, a comprehensive tracking system that provides extensive detail on what the professional development opportunity entailed should be established. Information of this nature could be stored in a statewide registry (see recommendation 2). Tracking more detailed information about professional development opportunities will allow leaders to better understand what teachers are experiencing and whether the opportunities are instructionally specific and aligned with CERDEP professional development goals and competencies.

Further, OELL and First Steps should consider forming partnerships to offer shared professional development opportunities for teachers from public and private settings. Doing so would help to ensure that regardless of the settings, all teachers have a similar set of competencies and skills. Indeed, in early 2019, South Carolina was awarded a federal Preschool Development Grant Birth through Five (PDG B–5) grant. The funds from this grant are designed to support the quality of state-level ECE systems. South Carolina's PDG B-5 funds may help to solidify collaboration across all CERDEP providers. Plans for the grant include more shared professional development opportunities across CERDEP settings and other ECE programs in the state, such as Head Start and other publicly funded 4K programs.

Recommendation 4: Work to provide more sustained and long-term professional development opportunities.

A key component of a professional development system is access to outreach promoting PLOs. Our review indicated that CERDEP teachers had access to a number of in-service professional development activities. However, some of the professional opportunities First Steps and OELL provided were discrete professional development workshops. Stakeholders should work to provide more long-term and sustained professional development opportunities that allow teachers to build new skills over time. OELL and First Steps might consider employing evidence-based professional development interventions that combine multiple forms of support—trainings, coaching, and peer networks—into one aligned model over the course of a full school year. These types of interventions may increase the quality of the learning opportunities teachers have access to in the professional development system and may be more likely to have a positive effect on teacher practices and classroom quality. OELL and First Steps can consider ways to make these approaches systematic by requiring that teachers participate and offering these interventions to all teachers across public and private settings.

Professional development opportunities of this nature may be more costly than shorter, workshop-based trainings. CERDEP stakeholders will need to consider available funding sources for such opportunities. As described in the section on Georgia's 4K program, some states make use of federal dollars to supplement state and local professional development dollars. Stakeholders might also consider incentivizing CERDEP providers to use existing funding sources, such as the South Carolina Community Block Grants for Education Pilot Program, to employ evidence-based professional development interventions.

Recommendation 5: Document CERDEP providers' receipt of coaching to ensure all teachers receive individualized support.

Coaching can be an effective professional learning support offered as part of an ECE workforce professional development system. While both OELL and First Steps implemented coaching as part of their professional development offerings, there is limited data on teachers' receipt of coaching support, including the number of visits or hours of coaching received. The coaching dosage likely varied between public and private settings and across teachers within settings. Stakeholders may consider setting a standard coaching dosage for all CERDEP teachers and tracking coaching hours to ensure that all teachers receive adequate support. Some teachers, particularly those in public school districts, may have access to other non-CERDEP coaching services. OELL and First Steps should consider tracking teachers' receipt of all coaching services and work to ensure that any CERDEP-sponsored coaching is aligned with and complementary to the other coaching supports teachers might receive.

Appendix A. CERDEP History and Program Features[20]

In this appendix, we present a more-detailed review of CERDEP than is included in the body of the report. This information will be useful to readers relatively unfamiliar with the program, or readers looking for a complete compilation of CERDEP information as of the publishing of this report. Specifically we cover the program's history, key features and requirements, program enrollment, and evaluation literature.[21]

Program History

CERDEP has its roots in the 2005 state Supreme Court ruling in *Abbeville v. the State of South Carolina*. The case began in 1993, when 40 South Carolina school districts (approximately 50 percent of the state's districts at the time) challenged the state's education-funding formula (Click and Hinshaw, 2014; Weiler, 2007). Specifically, the districts argued that the formula, based primarily on local property taxes, disadvantaged rural and low-income communities. Over the next decade, the case traveled in and out of the state's lower circuit courts and the state supreme court. Beginning in July 2003, arguments for an appeal of the case were heard in the Third Judicial Circuit Court; in a 2005 opinion, the court ruled in favor of both the plaintiff districts *and* the state. In sum, the opinion articulated that there was "nothing wrong with the 'inputs' into education or the funding formula provided for local education, or the revenues allocated by the state for public education" (Weiler, 2007, p. 9), *except* for the poor funding provided for ECE. While many saw the overall ruling as a loss for South Carolina public education,[22] given that no changes were made to the core K–12 funding formula, the ruling was a win for early childhood services. Following this ruling, the South Carolina General Assembly, the state's legislative body, established the CDEPP, a state-funded early childhood education program in low-income districts in the state. The program was signed into state law in 2014 by

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[20] The content of this appendix is taken, largely verbatim, from the companion report (Karoly and Gomez, 2019).

[21] This section draws heavily from the following citations: Friedman-Krauss et al., 2018; EOC, 2017, 2018; SCDE, 2018a, 2018b; First Steps, 2018a, 2018b.

[22] The 2005 ruling was not the final ruling in the Abbeville case. In 2014, an additional ruling came down from South Carolina's State Supreme Court stating that indeed the funding formulas were flawed, and failed to provide "minimally adequate" education—the court's interpretation of the state constitution's education clause—to all South Carolina children. Following this ruling, the South Carolina General Assembly was tasked with remedying the funding formula. As part of this effort, the assembly conducted assessments of education facilities and buildings, and provided $55.8 million for capital improvement projects in the plaintiff school districts. However, in November 2017, the 2014 ruling was vacated by the South Carolina State Supreme Court, meaning that the General Assembly was no longer responsible for altering school funding regulation. The primary argument for the new ruling was that the 2014 decision and the courts' attempts to influence education-funding legislation was an overreach of judicial power (Gilreath, 2017).

the Read to Succeed Act and renamed CERDEP (South Carolina General Assembly, 2014). By law, the program must serve children from low-income families in the states' poorest districts, and focus on reading and school readiness. Specifically, the law mandates that programs must provide: "(1) a comprehensive, systemic approach to reading that follows the State Reading Proficiency Plan and the district's comprehensive annual reading proficiency plan, (2) successful administration of the readiness assessment; (3) the developmental and learning support that children must have to be ready for school; (4) parenting education, including educating the parents as to methods that may assist the child; and (5) identification of community and civic organizations that can support early literacy efforts" (SCDE, undated-a).

CERDEP Features and Requirements

CERDEP is implemented using a mixed-delivery system with both public school districts and licensed private center–based providers able to serve eligible children. Oversight of the public district-based programs is provided by SCDE, while First Steps oversees implementation at private center–based providers. To be eligible to implement CERDEP districts must have a score of 70 percent or higher on the state poverty index.[23] These CERDEP-eligible districts may opt in or out of establishing CERDEP classrooms. Private providers may be located anywhere in the state, including in districts that do not meet the 70-percent poverty threshold. All children served by the program in either private or public settings must meet the criteria described below.

Table A.1 presents a summary of CERDEP's characteristics. NIEER has developed a set of quality indicators, or benchmarks, for state preK programs. In the 2017 State Preschool Yearbook, NIEER revised and released the following ten new benchmarks for quality (Friedman-Krauss et al., 2018):

- Benchmark 1. Early learning and development standards

- Benchmark 2. Curriculum supports

- Benchmark 3. Teacher degree

- Benchmark 4. Teacher specialized training

- Benchmark 5. Assistant teacher degree

- Benchmark 6. Staff professional development

- Benchmarks 7 and 8. Maximum class size and staff-child ratio

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[23] The poverty index is determined by the South Carolina Office of Revenue and Fiscal and is calculated based on the percentage of students and families in a district enrolled in Medicaid, Temporary Assistance for Needy Families, the Supplemental Nutrition Assistance Program, and Department of Social Services Foster Care.

Table A.1. CERDEP Features in Private and Public Providers, and Corresponding NIEER Quality Benchmarks

Program Feature	CERDEP Requirements	Applicable (New) NIEER Standard	Meets Standard[a]
Child/family eligibility	Child must be 4 by September 1 and family must have (a) income at or below 185 percent of the federal poverty guidelines or (b) be Medicaid eligible	None	–
Licensing	Must be licensed by the South Carolina Department of Social Services	None	–
Service options	• Traditional year: 180 days; 6.5 hours/day • Extended day: 180 days; up to 8.5 hours/day • Extended year: up to 220 days; 6.5–8.5 hours/day • Summer: up to 220 days; 180 days at 6.5–8.5 hours and 40 days of summer at 8.5 hours	None	–
Maximum class size and staff-child ratio	20 children 1:10 staff-child ratio	7 and 8. Maximum class size and staff-child ratio	Yes
Early learning standards	*South Carolina Early Learning Standards* guide children's learning and development	1. Early learning and development standards	Yes
Curriculum	• Big Day in Pre-K (public only) • *Creative Curriculum* • High Scope • InvestiGator Club (public only)[b] • Montessori • World of Wonders (public only)	2. Curriculum supports	Yes
Lead teacher degree	Public: BA Private: AA (with documentation of working toward a BA)	3. Teacher degree	No
Lead teacher specialization in early childhood	Public: Teaching certificate in early childhood Private: Associate degree in early childhood, a CDA, or other specialized ECE training	4. Teacher specialized training	Yes
Instructional assistant degree	HSD	5. Assistant teacher degree	No
Kindergarten readiness assessments	All children must be assessed at the start and end of the year by an approved reading assessment: • Individual Growth and Development Indicators Early Literacy (public only) • PALS–Pre-K (public only) • *Teaching Strategies GOLD*	None	–
Screenings and referrals	No requirements; health and developmental screenings recommended	9. Screenings and referrals	No
Teacher PD	15 hours of PD for teachers	6. Staff PD	Yes
Monitoring/CQI system	Regular monitoring and structured classroom observations	10. CQI system	Yes

SOURCES: Friedman-Krauss et al., 2018; EOC, 2017, 2018; SCDE, 2018a, 2018b; First Steps, 2018a, 2018b.
NOTES: CQI = continuous quality improvement; PD = professional development.
[a] As determined by NIEER (Friedman-Krauss et al., 2018).
[b] Curriculum approved for the 2018–2019 school year only.

- Benchmark 9. Screenings and referrals

- Benchmark 10. CQI system.

In the final two columns of Table A.1, we indicate, where relevant, the corresponding NIEER standard and whether the CERDEP features meet the applicable benchmark (as determined by NIEER's analysis of data from the 2016–2017 school year). As of 2016–2017, CERDEP met seven of ten quality metrics. In comparison to other states, meeting seven benchmarks puts South Carolina in the middle to the high end of the distribution in the 2016–2017 school year (the most recent with comprehensive data). Only three states—Michigan, Alabama, and Rhode Island—meet all ten, while five states met nine. Ten states met fewer than half of the benchmarks.

To be eligible for CERDEP, children living within CERDEP-eligible districts must have reached age four on or before September 1 and meet one of the following criteria: (1) have family income at or below 185 percent of the federal poverty guidelines or (2) be eligible for Medicaid. Families can choose to apply for a CERDEP slot in either a district or a private provider.

Across both public and private settings, all CERDEP providers are required to be licensed by the Division of Early Care and Education in the South Carolina DSS. All programs must operate for at least 180 school days, five days a week, with at least 6.5 hours of instruction per day—or the traditional school year service option. In the 2017–2018 school year, the General Assembly made additional funds available to expand CERDEP offerings. CERDEP sites had the option of three different expansions which included: extended day—180 days per year and up to 8.5 hours of instruction per day; extended year—up to 220 days per year and 6.5–8.5 hours of instruction per day; and summer—up to 220 days per year total with 180 days of 6.5–8.5 hours during the school year and 40 days of a summer program with up to 8.5 hours of instruction per day.[24]

In Table A.2, we present the distribution of chosen service options across the public school districts and private providers in the 2017–2018 school year. Approximately 15 and 30 percent of private providers and districts, respectively, administered one or more CERDEP classrooms with the traditional year. The majority of school districts and private providers (about 60 percent each) opted into the summer program option. The extended day and extended year were the least frequently adopted options. As discussed in more detail in the full report, each service option is associated with a different per-pupil reimbursement rate. For all service options, the staff-child ratio within a classroom cannot exceed 1:10, and classrooms with more than 11 children are

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[24] First Steps and SCDE defined the extended year and summer options differently. As defined by SCDE, the public school districts had the option of between 6.5 and 8.5 hours of instruction per day for extended year, while the private providers who implemented the extended-year option capped their hours at 6.5 (as defined by First Steps). Similarly, for the summer option, public schools had the option of between 6.5 and 8.5 hours of instruction for the 180 days of the school year, and 8.5 hours of instruction for the 40 day summer program. The private providers who implemented the summer option implemented only 6.5 hours only during the school year and 8.5 hours per day of summer instruction.

Table A.2. CERDEP Service Options for Participating Districts and Private Providers in 2017–2018

Service Option	Districts		Private Providers	
	N	**Percent**	*N*	**Percent**
Traditional year	18	29.5	29	14.7
Extended day	0	0.0	32	16.2
Extended year	6	9.8	25	12.7
Summer	37	60.7	117	59.4

SOURCES: SCDE, 2018a; First Steps, 2018a.
NOTES: There were a total of 197 private providers across the state and 61 districts implementing. CERDEP in 2017–2018. A total of five private providers implemented multiple service options (different classrooms implemented different service options). We count these providers in each of the service option totals they offered. Therefore, the totals across the private provider service options to not add up to a total of 197 providers or 100 percent.

required to have at least one lead teacher and one instructional assistant. In 2017, South Carolina's Division of Early Care and Education in DSS and the SCDE's Office of Early Learning and Literacy worked together to develop the South Carolina Early Learning Standards (DSS, 2018b). A number of other stakeholders, including First Steps and early childhood researchers at the University of South Carolina, were also involved in the effort. The document serves as universal guide for the state of the development and learning of young children ages birth to five. All CERDEP providers are required to align their programming with the standards. In addition to using the South Carolina Early Learning Standards, programs are required to use an approved, research-based curriculum. In the 2017–2018 school year, the approved curricula for school districts were *Big Day in Pre-K* (published by Houghton Harcourt), *Creative Curriculum* (published by Teaching Strategies), *High Scope* (published by High Scope), *World of Wonders* (published by McGraw Hill), and the curriculum associated with Montessori programs. In the 2018–2019 school year, *InvestiGator Club* (published by Robert Leslie) was added to the list of approved curriculum for the districts. The approved curricula for the private centers was a smaller list, including only *Creative Curriculum*, the High Scope curriculum, and Montessori. Private providers also had the option to seek approval with First Steps to use an alternative curricula.

All programs assess children's literacy at the start and end of their 4K year. The districts were allowed to select among three different assessments to use: *Individual Growth and Development Indicators* (published by EL Labs, Inc.); the *Phonological Awareness Literacy Screening (PALS™) Pre-K* (published by IO Education); and *Teaching Strategies® GOLD™* (published by Teaching Strategies, LLC). First Steps requires all private providers to use *Teaching Strategies® GOLD*. CERDEP guidelines do not require programs to conduct other development or health screenings, but such services are recommended when districts and providers have the resources to do so.

The requirements for teacher qualifications differ across public and private settings. In the school districts, all lead teachers are required to have a BA and a South Carolina certification in

early childhood education. Teacher's assistants must have an HSD or the equivalent, and have at least two years of experience working with children under five years old and must successfully complete or enroll in the CDA course within 12 months of being hired. In the private settings, teachers with BAs are preferred, but lead teachers are only required to have a two-year college degree in early childhood education, or a two-year college degree in another field with additional ECE (such as having a CDA credential). In addition, all lead teachers without a four-year degree must show evidence that they are enrolled in four-year teacher education program with an emphasis on ECE. Instructional assistants in the private setting are required to have an HSD or equivalent and some early childhood experience.

Once hired, both CERDEP and DSS regulations require that all lead teachers complete 15 hours of professional development per year. Teachers have the option to earn these hours through professional development opportunities they seek out on their own (e.g., college courses, online workshops) or by attending professional development trainings organized by First Steps (for private settings) and school districts (for public settings). CCCCD is a statewide organization that certifies and tracks CERDEP teachers' professional development hours.

CERDEP providers also engage in regular program quality monitoring and oversight activities. OELL monitors the quality of the programs in the districts. During the annual visit, OELL staff use the ELLCO to assess classroom quality. First Steps monitors program quality for the private providers using the Early Childhood Environment Rating Scale. The First Steps staff aims to visit all classrooms implementing CERDEP twice monthly; however, the frequency of visits varies by region. In addition to the CERDEP-mandated quality visits, the Division of Early Care and Education of the South Carolina Department of Social Services administers ABC Quality, the state's Quality Rating Improvement System (QRIS). Neither public nor private providers implementing CERDEP are required to participate, but both are eligible if they choose to do so. In addition to receiving an annual rating (from A+, or "Surpasses" quality standards, to C, or "Meets" quality standards), participating programs receive a range of services, including staff professional development and quality assistance. In the 2016–2017 school year, over 90 percent of private CERDEP providers were enrolled in ABC Quality (EOC, 2017); the state does not collect comprehensive data on district enrollment in the QRIS.

CERDEP Enrollment

In Table A.3, we present information on the number of children served by CERDEP in the 2016–2017 and 2017–2018 school years. Specifically, these figures represent the number of

Table A.3. Funded CERDEP Slots in the 2016–2017 and 2017–2018 School Years by Provider Type

Type of Provider	2016–2017		2017–2018	
	Number of Slots	Percent	Number of Slots	Percent
Public CERDEP	9,806	83.2	9,789	83.4
Private CERDEP	2,170	18.4	1,946	16.6
Total CERDEP	11,784	100.0	11,735	100.0

SOURCE: EOC, unpublished data, undated.

CERDEP-funded slots for students.[25] In 2017–2018, 64 districts were CERDEP-eligible and 61 opted into the program—approximately 74 percent of the states' 82 total districts. Additionally, 197 private providers across the state implemented CERDEP in 2017–2018. In this school year, CERDEP served a total of 11,735 children; the large majority of children—about 83 percent—attended a CERDEP classroom in a public school district, with fewer than 2,000 children attending a CERDEP classroom at a private provider. Based on recent state estimates, the roughly 11,700 children served by CERDEP represented about 34 percent of all low-income children in the state at the time.[26] The enrollment between 2016–2017 and 2017–2018 was fairly consistent, with only a slight drop in the number of students.

Reliable enrollment data from previous years is not available due to past errors in reporting. In 2006–2007, the first year of the program, only the 34 trial and plaintiff districts from the *Abbeville* case—and the private providers in their catchment area—were eligible to administer CERDEP. The number of eligible districts remained constant until the 2013–2014 school year, when the General Assembly broadened the eligibility requirements to all districts with a score of 75 percent or above on the state poverty index. This change increased the number of eligible districts to 51, also increasing the number of children served. Then in the 2014–2015 school year—the year in which the program was codified into law—the eligible criteria was changed to include districts with a poverty index of 70 percent or less, increasing the number of eligible districts to 64 and again likely increasing the number of children served. As of the 2018–2019 school year, the criteria and number of eligible districts have not changed.

The Evaluation Literature on CERDEP and State-Funded PreK in South Carolina

While there has never been a causal evaluation of the effects of CERDEP on children's literacy or school readiness outcomes, there is some evidence to suggest that state-funded ECE in

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[25] Due to attrition and turnover throughout the school year, the number of children who spent at least one day in a CERDEP classroom may exceed these numbers. However, reliable data do not exist on the exact number of children who held these slots is not available.

[26] Based on estimates of low-income children in the state from EOC, 2018.

the state of South Carolina supports child development. In the 2004–2005 school year (two years before the pilot program that would become CERDEP was founded), South Carolina was included in a multistate evaluation of state-funded preK programs (Wong et al., 2008). At that time, the Half-Day Child Development Program was the only state-funded preK in the state. It was funded through the Education Improvement Act (EIA) with additional support from First Steps to School Readiness. At the time of this report's writing, children were served in both private and public settings, with the majority of children enrolled in public district–based settings. Using a quasiexperimental research design that capitalized on the child eligibility age cutoff, the evaluation estimated that South Carolina preK had a positive and significant impact on children's print awareness but not on their receptive vocabulary (Wong et al., 2008).

As described above, all CERDEP children are assessed on their literacy skills at the beginning and end of their 4K year. Descriptive analyses from 2016–2017 indicate that by the spring of that school year, over 75 percent of CERDEP children who took the cognitive assessments met or exceeded normal expectations for children in their age group (EOC, 2018). These analyses lack a research design that can confirm whether CERDEP caused children to be kindergarten-ready. However, the descriptive analyses do suggest that most children who participate in CERDEP enter kindergarten with skills on par with national norms.

Appendix B. Technical Methods Details for Chapter 2

In this appendix, we detail the data and methods used to execute the statistical analyses presented in Chapter 2.

Variable Sources and Definitions

We obtained data on CERDEP teachers and the available characteristics, community zip code characteristics, child characteristics, and child B3–GOLD assessments. Descriptive statistics for all provider- and child-level characteristics are presented in Table B.1 for the analytic sample, and by each provider-level teacher education category. Tables B.2 and B.3 report descriptive statistics for the B3–GOLD language and literacy scale scores and WHE scores for the beginning- and end-of-year administration, respectively.

Child Characteristics

SCDE provided information on child demographic characteristics and other status measures.

Child age: SCDE calculated child age in months as of September 1, 2017. (Date of assessment was not available, so child age on the date of the B3–GOLD assessment could not be calculated.)

Child gender: We created a binary indicator where a value of 1 indicated the child was female, and a value of 0 indicated the child was male.

Child race/ethnicity: The coded options in the SCDE child record for race and ethnicity were (1) White, (2) Black, (3) Asian, (4) Pacific Islander, (5) Native American, (6) Hispanic, and (7) multirace. We created binary indicators to represent child race and ethnicity, where a value of 1 indicated membership in a given racial or ethnic group, and a value of 0 indicated otherwise. The first category, non-Hispanic white, was used as the reference category in all models.

Limited English proficiency: The child-level record also indicated whether a child had been identified as having limited English proficiency (LEP). We created a binary indicator for this variable where a value of 1 indicated the child had LEP, and a value of 0 indicated otherwise. As noted in Table B.1, the missingness rate for LEP was extremely high in the sample (over 90 percent). It is not clear why most children do not have this characteristic observed; however, we suspect that the necessary data are not collected well in private settings. We report this demographic characteristic for context, but do not include this variable in the subsequent statistical models due to the high level of missingness.

Individual education plan: The data indicated whether a child had received an individual education plan (IEP). We created a binary indicator for this variable where a value of 1 indicated the child had an IEP, and a value of 0 indicated otherwise.

Table B.1. Descriptive Statistics for the Child and Provider Characteristics for the Analytic Sample and by Each Provider-Level Teacher Education Category

Indicator	Total Analytic Sample	Provider-Level Teacher Education Category		
		All Teachers Have a BA	Some Teachers Have a BA	No Teachers Have a BA
Child characteristics				
Age in months (mean, s.d.)	53.9	53.9	53.8	54.0
	(3.5)	(3.6)	(3.5)	(3.5)
Gender (percentage distribution)				
Male	50.9	49.8	55.5	52.3
Female	49.1	50.2	44.5	47.7
Race/ethnicity (percentage distribution)				
White	25.9	24.4	33.6	27.5
Black	59.7	60.5	56.4	58.8
Hispanic	4.2	4.6	0.9	4.1
Asian	0.5	0.5	0.9	0.4
Native American	0.4	0.5	0.0	0.4
Pacific Islander	0.2	0.3	0.0	0.0
Multiracial	7.1	7.8	8.2	5.2
Missing	2.0	1.4	0.0	3.7
LEP (percentage distribution)				
Yes	0.1	5.0	0.0	0.0
No	5.3	0.2	9.1	5.2
Missing	94.6	94.9	90.9	94.8
IEP (percentage distribution)				
Yes	0.2	0.3	0.0	0.0
No	99.8	99.7	100.0	100.0
Provider characteristics				
Number of CERDEP teachers (mean, s.d.)	1.3	1.2	2.5	1.1
	(0.5)	(0.5)	(0.5)	(0.2)
Number of CERDEP children (mean, s.d.)	16.8	17.0	36.9	12.3
	(10.5)	(9.2)	(16.9)	(5.7)
New provider in 2017–2018 (percentage)	9.5	11.5	0.0	7.1
CERDEP service option (percentage distribution)				
Traditional school year	12.5	12.8	0.0	14.3
Extended day	11.3	11.0	0.0	14.5
Extended year	10.3	9.3	0.0	14.7
Summer	58.1	62.4	31.8	53.8
Multiple service options within center	7.7	4.5	68.2	2.8
ABC Quality rating				
A+	22.2	16.8	84.6	21.7
A	42.4	45.0	15.5	41.9
B+	15.8	17.7	0.0	14.7
B	0.9	1.3	0.0	0.0
C	1.7	1.8	0.0	1.9

Indicator	Total Analytic Sample	Provider-Level Teacher Education Category		
		All Teachers Have a BA	Some Teachers Have a BA	No Teachers Have a BA
Missing	17.1	17.4	0.0	19.9
Provider zip code census characteristics				
Adult race/ethnicity distribution (mean, s.d.)				
Hispanic	4.7	4.7	3.9	4.8
	(3.9)	(4.0)	(0.6)	(4.2)
Non-Hispanic white	56.3	56.4	63.1	54.6
	(18.1)	(18.7)	(4.8)	(18.1)
Non-Hispanic black	35.4	35 .0	30.3	37.1
	(19.5)	(20.3)	(4.7)	(19.3)
Non-Hispanic Asian	1.3	1.4	1.2	1.1
	(1.1)	(1.2)	(0.7)	(1.1)
Non-Hispanic Native American	0.3	0.3	0.1	0.2
	(0.5)	(0.6)	(0.1)	(0.2)
Non-Hispanic Pacific Islander	0.0	0.1	0.0	0.0
	(0.1)	(0.1)	(0.1)	(0.1)
Non-Hispanic Other	0.2	0.2	0.0	0.2
	(0.2)	(0.2)	(0.0)	(0.2)
Non-Hispanic more than one race	1.8	1.8	1.4	1.8
	(1.4)	(1.3)	(0.8)	(1.8)
Percentage single-headed household (mean, s.d.)	34.9	35.0	33.4	35.1
	(9.9)	(10.1)	(2.4)	(10.5)
Adult education distribution (mean, s.d.)				
Less than an HSD	15.3	15.0	14.9	16.0
	(5.9)	(6.1)	(5.2)	(5.4)
HSD or equivalent	31.4	31.3	29.1	32.1
	(6.8)	(6.2)	(7.4)	(7.7)
Some college	30.5	30.5	29.1	30.9
	(5.0)	(4.6)	(5.9)	(5.7)
BA or higher	22.9	23.3	26.9	21.1
	(10.0)	(9.8)	(14.5)	(9.2)
Median family income (in thousands) (mean, s.d.)	52.69	52.57	59.39	51.61
	(11.56)	(11.08)	12.43)	(12.00)
N	1,860	1,211	110	539

SOURCE: Authors' analysis of SCDE administrative data.
NOTE: s.d. = standard deviation. If no missingness rate is listed, there were no missing values for that variable.

Teacher and Provider Characteristics

First Steps provided information on teacher and provider characteristics.

Teacher education: For private providers, teacher education data were provided by First Steps at the teacher level for 192 centers and 211 teachers. The raw data included four categories: (1) AA with documentation that the teacher was enrolled in a four-year degree program; (2) BA; (3) master's degree (e.g., master of arts, master of arts in teaching, master in education); and (4) doctoral or professional degree. In this data set, a Juris Doctor—professional law degree—was the only observed response in that last category.

For public school districts, teacher education data were provided by SCDE at the district level for 61 districts and 599 teachers. The education categories were: (1) BA; (2) BA, plus additional hours or specialized certification training; (3) master's degree; (4) master's degree, plus additional hours or specialized certification training; and (5) doctoral degree. For the purposes of these analyses, we collapsed all teacher education responses from both private providers and public school districts options into three categories: (1) AA; (2) BA; or (3) master's degree of higher.

For the private providers, we created a provider-level categorial variable that recorded the share of teachers within a center that had a BA. The variable was defined as three binary indicators: (1) all teachers had a BA; (2) some teachers had BA; and (3) no teachers had a BA. For all three indicators, a value of 1 indicated the center fell into that category; a value of 0 indicated otherwise. For all models presented here, the third category, "no teachers had a BA" was specified as the reference category.

Number of CERDEP teachers: For private providers only, First Steps provided data on the number of lead teachers serving CERDEP children in each center. We included this continuous variable in our models.

Number of CERDEP children: For private providers only, First Steps provided data on the number of CERDEP children in the center. We included this continuous variable in our models.

New provider: For private providers only, First Steps provided data whether or not the providers were new to the CERDEP program in 2017–2018. We created a binary variable that took on a value of 1 for new providers and a value of 0 otherwise.

Provider service option: For private providers only, First Steps provided data on the providers' service option in the 2017–2018 school year, or the number of days and hours of instruction CERDEP providers offered. As described in Appendix A, there were four different CERDEP service options: (1) traditional year—180 school days with at 6.5 hours of instruction per day; (2) extended day—180 days per year and up to 8.5 hours of instruction per day; (3) extended year—up to 220 days per year and 6.5–8.5 hours of instruction per day; (4) summer— up to 220 days per year total with 180 days of 6.5–8.5 hours during the school year and 40 days of a summer program with up to 8.5 hours of instruction per day. Using these data, we created binary variables to records providers' service options. We added one more category to those

listed above, "mixed options," for providers where different classrooms within the same provider adopted different service options. For all variables, a value of 1 indicated the center fell into that category; a value of 0 indicated otherwise. For all models presented here, the first category, the traditional school year, was specified as the reference category.

Child care center quality: For private providers only, child care center quality data were measured by the providers' ABC Quality ratings, the state's QRIS. Centers can receive one of five possible ratings from A+ to C, with an A+ indicating the highest level of quality and a C indicating the lowest level of quality. CERDEP providers are not required to be enrolled in ABC Quality. The data did not indicate whether missing value on a provider's ABC quality rating was missing because the provider chose not to enroll, or because the rating was truly missing. First Steps provided data on providers' ABC quality ratings for 2016–2017 school year, the year prior to when all other data were collected. Data for the 2017–2018 were not available. As part of ABC Quality, providers are rated every two years. For many programs, it is likely that their 2016–2017 rating was still current in 2017–2018; however, no data exist to confirm this assumption. For the purpose of our analyses, we created binary variables for the following values (1) A+ rating; (2) A rating; (3) B+ rating; (4) B rating; (5) C rating; and (6) missing or not enrolled. For all variables, a value of 1 indicated the provider fell into that category; a value of 0 indicated otherwise. For all models presented here, the fifth category, the C rating, was specified as the reference category.

County indicators: For private providers only, First Steps provided information on the county in which the providers were located. We created binary indicators for each of the counties represented in the sample, where a value of 1 indicated the providers' county, and a value of 0 indicated otherwise.

Community Zip Code Characteristics

For private providers only, we gathered zip code–level characteristics from the 2017 ACS five-year estimates. Data were downloaded from ACS open-source website and matched to the providers by zip code (U.S. Census Bureau, undated). We used the following variables:

- adult race/ethnicity, defined as the percentage of adults 25 years or older who identified as Hispanic, non-Hispanic white, non-Hispanic black, non-Hispanic Asian, non-Hispanic Native American, non-Hispanic Pacific Islander, non-Hispanic other, and non-Hispanic more than one race

- adult education levels, defined as the percentage of adults 25 years or older who had not earned an HSD, had an HSD or equivalent, had attended some college, and had a BA or higher

- percentage of single adult–headed family households[27]
- median family income (family defined as a household with two or more related people).

Child B3–GOLD Assessment Data

SCDE provided data on children's literacy and language outcomes from the beginning-of-year and end-of-year administration for the 2017–2018 school year for all CERDEP students. We made use of the data for the children enrolled in private providers.

Children's language and literacy outcomes were measured by B3–GOLD. The B3–GOLD is a standardized assessment designed to measure children's developmental skills. The measure is not a direct assessment of child skills; rather, teachers rate children's skill levels using evidence and information gathered during classroom interactions. CERDEP teachers rate children in two of the domains covered by B3–GOLD: (1) language—including children's ability to listen to and understand verbal language, and use verbal language and other communication skills to express thoughts; and (2) literacy—including children's phonological awareness, phonics skills, word recognition, alphabet knowledge, print knowledge and use, ability to understand and respond to books and other texts, and writing skills. All teachers use the *Teaching Strategies* online platform to record their ratings; all ratings are then transferred to a central database maintained by SCDE.

We made use of two different forms of children's scores. First, we used the scale scores which are vertically scaled and normed to a mean of 500 and standard deviation of 100 (Lambert, 2017). We used the beginning-of-year scaled scores as a control variable (a pretest) in the multivariate models. We also used WHE scores, which report on whether children fall below, meet, or exceed skill level expectations for their age groups (Burts, Baker, and Bickart, 2016). We created binary indicators for the language and literacy outcomes, in which a value of 1 indicated that children met or exceeded expectations, and a value of 0 indicated children fell below expectations. We used the binary indicator for children's scores as the outcome in all models. Descriptive statistics for the B3–GOLD measures are presented in Tables B.3 and B.4.

Analytic Strategy

To address the second study question regarding the relationship between teacher's levels of education and child outcomes, we fit a series of linear probability models in which we modeled the probability that a child would meet or exceed age-level expectations (versus falling below them) as a function of the provider-level teacher education variables, and the provider and child characteristics described in previous sections. The primary model was specified as:

$$Y_{ip} = \beta_0 + \beta_1 SOME\_BA_p + \beta_2 ALL\_BA_p + \beta_3 W_{ip} + \varepsilon_{ip} \qquad (1)$$

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[27] We created this variable by summing the total of single-female-headed family households and single-male-headed family households and dividing by total households within the zip code.

Table B.2. Beginning-of-Year B3–GOLD Scaled Scores and WHE Scores for the Total Analytic Sample, By Provider-Level Teacher Education Category

		Provider-Level Teacher Education Category		
Indicator	Total Analytic Sample	All Teachers Have a BA	Some Teachers Have a BA	No Teachers Have a BA
B3–GOLD: Language				
Scaled score (mean, standard deviation)	365.0	368.6	344.9	360.8
	(75.5)	(78.6)	(65.3)	(69.4)
WHE score (percentage distribution)				
Meets or exceeds expectations	45.1	47.1	35.5	42.5
Below expectations	54.9	52.9	64.5	57.5
N	1,860	1,211	110	539
B3–GOLD: Literacy				
Scaled score (mean, standard deviation)	527.7	525.7	490.7	539.9
	(78.1)	(75.0)	(87.1)	(80.2)
WHE score (percentage distribution)				
Meets or exceeds expectations	51.3	51.0	40.0	54.4
Below expectations	48.7	49.0	60.0	45.6
N	1,857	1,208	110	539

SOURCE: Authors' analysis of SCDE administrative data.

Table B.3. End-of-Year B3–GOLD Scaled Scores and WHE Scores for the Total Analytic Sample, By Provider-Level Teacher Education Category

		Provider-Level Teacher Education Category		
Indicator	Total Analytic Sample	All Teachers Have a BA	Some Teachers Have a BA	No Teachers Have a BA
B3–GOLD: Language				
Scaled score (mean, standard deviation)	460.2	462.3	456.1	456.2
	(105.4)	106.2)	(117.6)	(101.0)
WHE score (percentage distribution)				
Meets or exceeds expectations	85.0	86.5	82.7	82.0
Below expectations	15.0	13.5	17.3	18.0
N	1,860	1,211	110	539
B3–GOLD: Literacy				
Scaled score (mean, standard deviation)	635.1	637.2	607.8	636.1
	(82.2)	(81.7)	(93.7)	(79.8)
WHE score (percentage distribution)				
Meets or exceeds expectations	90.8	90.9	86.4	91.5
Below expectations	9.2	9.1	13.6	8.5
N	1,857	1,208	110	539

SOURCE: Authors' analysis of SCDE administrative data.

In model 1, Y_{ip} is the WHE score—set to 1 for exceeds or meets expectations, or 0 for falls below—for child i in provider p. β_1 represents the estimated differential in the predicted probability of a child meeting or exceeding age-level expectations for children who attended centers where some teachers had a BA, as compared with centers where no teachers had a BA. β_2 represents the estimated differential in the predicted probability of a child meeting or exceeding age-level expectations for children who attended centers where all teachers had a BA, as compared with centers where no teachers had a BA. W_{ip} represents the set of child and provider characteristics, the pretest measure, and the county indicators. ε_{is} represents an individual stochastic error term.

Model 1 does not include a provider-level stochastic error term. However, we note that children are nested within providers, and it may be important to account for provider-level variation in the modeling process. To address this issue, we fit a model with robust standard errors, correcting for the nested data. We recognize that there many different analytic strategies to account for nested data. As a sensitivity analysis, we also fit a hierarchal linear model (HLM) that actively estimated the between- and within-provider variation in the outcome. We found the model results and inferences were the nearly identical in the robust standard error model we report and the alternative hierarchical linear models. In favor of simplicity, we present only the model using robust standard errors.

To address the study question, we fit a series of models, progressively adding groups of controls as follows:

- Model 1: includes only the teacher education variables

- Model 2: includes only children's beginning of year score and the teacher education variables

- Model 3: Model 2, with the addition of the child characteristics

- Model 4: Model 3, with the addition of the provider characteristics provided by First Steps

- Model 6: Model 4, with the addition of the provider zip code characteristics from the ACS

- Model 6: Model 5, with the addition of the county fixed effects

- Model 7: Model 6, accounting for robust standard errors.

These models are presented separately for the language and literacy outcomes in Tables B.4 and B.5, respectively. We consider Model 6 for each outcome to be our final model; we refer to the results of Model 6 in the body of the report.

We conducted two sets of sensitivity analyses. First, we fit our series of models using the end-of-year scaled scores as an outcome, instead of the binary WHE scores. The scaled scores capture more variation in the outcome and may facilitate a more precise estimate of the

differences between groups. We used ordinary least squares regression to fit these models. The substantive conclusions from these models were identical to those models in Tables B.4 and B.5 and thus are not presented here. We also fit our series of models using logistic regression instead of linear probability models, to ensure our results were not sensitive to the distribution of the binary outcome or out-of-range predictions. The logistic regression models yielded results and substantive conclusion that were no different from our primary models. As such, we have not included a detailed model from the logistic regression specification here.

Missing Data Strategy

Rates of missing data are presented in Table B.1 along with the demographic characteristics. Data were missing for one of the child characteristics—race/ethnicity—and one of the provider characteristics—ABC Quality rating. In an effort to include all children with beginning-of-year and end-of-year data, we employed a "missing data indicator" strategy and created such an indicator for all the controls. That is, we created a binary indicator for each control variable with missing values in which a value of 1 indicated a missing value on the control variable, and a value of 0 indicated that the control variable was observed. Essentially, the missing data indicators allow us to treat the fact that the observations are missing data on some variables as useful information that could explain variation in the outcome. Given that we had only a limited number of controls available, we chose this missing data technique over other options—specifically, multiple imputation—that rely on having a large number of control variables and over analytic assumptions that our data did not meet (Little and Rubin, 2002).

There was no missingness on the census characteristics, with the exception of one zip code that contained one center with a total of 32 children. For that zip code, the ACS did not have observed data on the percentage of single-parent households or median family income. Our primary models exclude these 32 children in order to include all of the zip code–level variables. However, we conducted a sensitivity analyses where we included these children in the models and dropped to two census variables with missing values; the primary results and inferences remained unchanged.

Table B.4. Linear Probability Models: Meets or Exceeds Expectations for B3–GOLD Language

Covariate [Omitted Category]	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Teacher education category [no teachers have a BA]							
Some teachers have a BA	0.007	0.035	0.026	0.076	0.015	0.035	0.035
	(0.037)	(0.035)	(0.035)	(0.047)	(0.051)	(0.052)	(0.186)
All teachers have a BA	0.045*	0.032~	0.032~	0.039*	0.021	-0.017	-0.017
	(0.018)	(0.017)	(0.017)	(0.018)	(0.018)	(0.018)	(0.036)
Pretest (beginning of the year B3–GOLD)		0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Child age				0.002	0.002	0.002	0.003	0.003
				(0.002)	(0.002)	(0.002)	(0.002)
Female [male]				0.025	0.024	0.027~	0.029*	0.029~
				(0.015)	(0.015)	(0.015)	(0.013)	(0.017)
Race/ethnicity [non-Hispanic white]							
Non-Hispanic black				-0.081***	-0.033~	-0.033	-0.003	-0.003
				(0.018)	(0.019)	(0.020)	(0.019)	(0.020)
Hispanic				-0.065	-0.039	-0.013	-0.023	-0.023
				(0.040)	(0.040)	(0.039)	(0.036)	(0.043)
Asian				-0.249*	-0.218*	-0.205~	-0.191*	-0.191~
				(0.111)	(0.110)	(0.107)	(0.097)	(0.105)
Native American				-0.003	0.050	0.059	0.032	0.032
				(0.118)	(0.116)	(0.113)	(0.103)	(0.098)
Pacific Islander				0.083	0.049	0.039	0.054	0.054
				(0.192)	(0.188)	(0.183)	(0.167)	(0.052)
Multiracial				0.002	0.026	0.034	0.041	0.041*
				(0.033)	(0.032)	(0.032)	(0.029)	(0.020)
Race missing				-0.136*	-0.055	-0.079	-0.017	-0.003
				(0.057)	(0.058)	(0.062)	(0.058)	(0.020)
Individual education plan status [no IEP]				-0.023	-0.064	-0.046	-0.047	-0.047
				(0.191)	(0.188)	(0.183)	(0.167)	(0.262)
Number of CERDEP teachers					-0.106***	-0.025	-0.046	-0.025
					(0.031)	(0.031)	(0.034)	(0.080)
Number of CERDEP children					0.002	-0.002	0.000	-0.002
					(0.001)	(0.002)	(0.002)	(0.004)

Covariate [Omitted Category]	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
New provider [not a new provider]				-0.183*** (0.039)	-0.134*** (0.039)	-0.132*** (0.039)	-0.132* (0.063)
CERDEP service option [traditional school year]							
Extended day				-0.104** (0.033)	-0.100** (0.035)	-0.110** (0.037)	-0.110 (0.077)
Extended year				-0.207*** (0.033)	-0.223*** (0.034)	-0.255*** (0.038)	-0.255** (0.081)
Summer				-0.087*** (0.026)	-0.122*** (0.026)	-0.096*** (0.027)	-0.096* (0.048)
Multiple service options within center				0.057 (0.046)	0.099* (0.047)	-0.022 (0.053)	-0.022 (0.109)
ABC quality rating [C]							
B				0.039~ (0.021)	0.013 (0.021)	0.103*** (0.023)	0.103~ (0.060)
B+				0.049~ (0.028)	0.074** (0.028)	0.173*** (0.033)	0.173** (0.066)
A				0.179* (0.084)	0.254** (0.083)	0.363*** (0.079)	0.363** (0.117)
A+				0.057 (0.061)	0.114~ (0.062)	0.288*** (0.072)	0.288** (0.095)
Missing				0.201*** (0.034)	0.167*** (0.035)	0.197*** (0.036)	0.197** (0.060)
Zip code adult race/ethnicity [non-Hispanic white]							
Percentage Hispanic					-0.009*** (0.002)	-0.011*** (0.003)	-0.011 (0.007)
Percentage Non-Hispanic black					0.001 (0.001)	-0.001 (0.001)	-0.001 (0.003)
Percentage Non-Hispanic Asian					0.057*** (0.010)	0.034** (0.013)	0.034 (0.027)
Percentage Non-Hispanic Native American					0.083*** (0.017)	0.036 (0.051)	0.036 (0.112)
Percentage Non-Hispanic Pacific Islander					-0.343*** (0.084)	-0.139 (0.088)	-0.139 (0.200)
Percentage Non-Hispanic other race					-0.037 (0.048)	-0.084 (0.062)	-0.084 (0.128)

Covariate [Omitted Category]	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Percentage Non-Hispanic more than one race					-0.017* (0.008)	-0.053*** (0.012)	-0.053* (0.021)
Zip code percentage single-headed household					-0.007*** (0.002)	-0.010*** (0.002)	-0.010* (0.005)
Zip code adult education [less than an HSD]							
Percentage with an HSD or equivalent					-0.008* (0.004)	-0.001 (0.005)	-0.001 (0.010)
Percentage with some college					-0.003 (0.003)	0.010** (0.004)	0.010 (0.006)
Percentage with a BA or higher					-0.003 (0.003)	0.000 (0.004)	0.000 (0.009)
Zip code median family income					-0.004** (0.002)	-0.007** (0.003)	-0.007 (0.005)
Country controls	No	No	No	No	No	Yes	Yes
Robust standard errors	No	No	No	No	No	No	Yes
Constant	0.820*** (0.015)	0.199*** (0.040)	0.147 (0.122)	0.237~ (0.124)	1.048*** (0.268)	0.779* (0.359)	0.779 (0.649)
N	1,860	1,860	1,860	1,860	1,860	1,860	1,860

SOURCE: Authors' analysis of SCDE administrative data.
NOTES: Tables include parameter estimates and standard errors in parentheses. ~$p < 0.1$, * $p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Table B.5. Linear Probability Models: Meets or Exceeds Expectations for B3–GOLD Literacy

Covariate [Omitted Category]	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Mode 7
Teacher education category [no teachers have a BA]							
Some teachers have a BA	-0.051~	0.001	-0.004	0.039	-0.046	-0.067	-0.067
	(0.030)	(0.029)	(0.029)	(0.040)	(0.043)	(0.046)	(0.153)
All teachers have a BA	-0.006	0.009	0.011	0.013	0.003	-0.008	-0.008
	(0.015)	(0.014)	(0.014)	(0.015)	(0.015)	(0.016)	(0.032)
Pretest (beginning of the year B3–GOLD)		0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Child age				0.004*	0.004*	0.004*	0.004*	0.004*
				(0.002)	(0.002)	(0.002)	(0.002)
Female [male]				0.030*	0.029*	0.030*	0.028*	0.028*
				(0.013)	(0.013)	(0.012)	(0.012)	(0.012)
Race/ethnicity [non-Hispanic white]							
Non-Hispanic black				-0.052***	-0.023	-0.030~	-0.021	-0.021
				(0.015)	(0.016)	(0.017)	(0.016)	(0.016)
Hispanic				-0.025	0.000	0.009	0.000	0.000
				(0.034)	(0.033)	(0.033)	(0.031)	(0.027)
Asian				-0.184*	-0.168~	-0.154~	-0.153~	-0.153
				(0.093)	(0.092)	(0.090)	(0.085)	(0.106)
Native American				-0.061	-0.034	0.015	0.008	0.008
				(0.098)	(0.097)	(0.096)	(0.090)	(0.127)
Pacific Islander				0.050	0.025	0.018	0.023	0.023
				(0.160)	(0.157)	(0.154)	(0.146)	(0.071)
Multiracial				-0.010	0.003	0.000	0.013	0.013
				(0.027)	(0.027)	(0.027)	(0.025)	(0.020)
Race missing				-0.095*	-0.067	-0.073	-0.064	-0.064
				(0.047)	(0.048)	(0.052)	(0.051)	(0.068)
Individual education plan status [no IEP]				-0.532***	-0.554***	-0.544***	-0.512***	-0.512~
				(0.159)	(0.157)	(0.155)	(0.146)	(0.267)
Number of CERDEP teachers					-0.099***	-0.048~	-0.044	-0.044
					(0.026)	(0.026)	(0.029)	(0.059)
Number of CERDEP children					0.001	-0.001	0.001	0.001
					(0.001)	(0.001)	(0.002)	(0.003)

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Covariate [Omitted Category]	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Mode 7
New provider [not a new provider]				-0.068* (0.033)	-0.046 (0.033)	-0.061~ (0.034)	-0.061 (0.067)
CERDEP service option [traditional school year]							
Extended day				-0.096*** (0.027)	-0.108*** (0.029)	-0.114*** (0.032)	-0.114 (0.073)
Extended year				-0.147*** (0.028)	-0.178*** (0.029)	-0.165*** (0.033)	-0.165* (0.067)
Summer				-0.012 (0.021)	-0.036 (0.022)	-0.019 (0.024)	-0.019 (0.031)
Multiple service options within center				0.111** (0.039)	0.127** (0.040)	0.101* (0.046)	0.101 (0.080)
ABC quality rating [C]							
B				0.033~ (0.018)	0.025 (0.018)	0.069*** (0.020)	0.069 (0.041)
B+				0.035 (0.023)	0.047* (0.024)	0.055~ (0.029)	0.055 (0.045)
A				0.009 (0.070)	0.041 (0.071)	0.088 (0.069)	0.088 (0.068)
A+				0.086~ (0.051)	0.135** (0.052)	0.189** (0.063)	0.189* (0.081)
Missing				0.117*** (0.028)	0.118*** (0.030)	0.153*** (0.032)	0.153* (0.064)
Zip code race/ethnicity [non-Hispanic white]							
Percentage Hispanic					-0.005* (0.002)	-0.008** (0.003)	-0.008 (0.005)
Percentage non-Hispanic black					0.000 (0.001)	-0.001 (0.001)	-0.001 (0.002)
Percentage non-Hispanic Asian					0.047*** (0.009)	0.027* (0.011)	0.027 (0.018)
Percentage non-Hispanic Native American					-0.035* (0.014)	-0.117** (0.045)	-0.117 (0.074)
Percentage non-Hispanic Pacific Islander					-0.256*** (0.071)	-0.112 (0.077)	-0.112 (0.142)
Percentage non-Hispanic other race					-0.079~ (0.041)	-0.150** (0.054)	-0.150~ (0.090)

Covariate [Omitted Category]	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Mode 7
Percentage non-Hispanic more than one race					-0.001 (0.007)	-0.009 (0.011)	-0.009 (0.019)
Zip code percentage single-headed household					-0.004* (0.002)	-0.004~ (0.002)	-0.004 (0.003)
Zip code adult education [less than an HSD]							
Percentage with an HSD or equivalent					-0.002 (0.003)	0.002 (0.004)	0.002 (0.007)
Percentage with some college					-0.006* (0.002)	-0.004 (0.003)	-0.004 (0.006)
Percentage with a BA or higher					-0.002 (0.003)	-0.001 (0.004)	-0.001 (0.006)
Zip code median family income					-0.001 (0.001)	-0.002 (0.002)	-0.002 (0.003)
Country controls	No	No	No	No	No	Yes	Yes
Robust standard errors	No	No	No	No	No	No	Yes
Constant	0.915*** (0.012)	0.343*** (0.047)	0.169 (0.104)	0.257* (0.106)	0.728** (0.227)	0.578~ (0.316)	0.578 (0.495)
N	1,857	1,857	1,857	1,857	1,857	1,857	1,857

SOURCE: Authors' analysis of SCDE administrative data.
NOTES: Tables include parameter estimates and standard errors in parentheses. ~p < 0.1, * $p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Appendix C. Comparing CERDEP Children Across Public and Private Settings

In this appendix, we compare the demographic characteristics and early learning outcomes of children who attended 4K programs in public school districts that offered CERDEP with children who attended CERDEP in private settings. The goal of this appendix is to supplement and provide context for the teacher education analyses presented in Chapter 2. The primary analyses in Chapter 2 compare the outcomes of CERDEP children who attended private centers where all teachers had earned a BA with children who attended centers where only some or no teachers had a BA. These analyses only included children in private CERDEP providers. However, CERDEP stakeholders may also be interested in understanding how the outcomes of children who attended CERDEP in public school districts compare with children in private centers. In particular, the comparison of children in private centers where all teachers had a BA with CERDEP children in public school districts (where all teachers are required to have at least a BA) may provide some insight into the variation in child outcomes across public and private settings when one key factor—teacher education levels—is held constant.

The SCDE administrative data set contained information on children who attended CERDEP in public school districts in the 2017–2018 school year. We use these data in this analysis. In addition to CERDEP, South Carolina public school districts also had the option to implement other publicly funded non-CERDEP 4K programs, including the Half Day Child Development Program, created as part of the EIA, and 4K slots funded by Title I dollars and local funding. Some districts administered CERDEP and had non-CERDEP 4K slots. South Carolina law requires that all children served by a publicly funded 4K program be assessed at the beginning and end of the 4K year. As such, the SCDE data set includes data from children who attended CERDEP (in private and public settings) and from children who attended other publicly 4K programs. It is important to note that CERDEP is the only publicly funded 4K program that was administered in private settings. The other publicly funded 4K programs were only administered in public school districts.

In the 2017–2018 school year SCDE data set, it is possible to identify the districts that administered CERDEP programs (referred to as CERDEP districts). However, the data set does not contain a child-level CERDEP indicator; therefore, it is not possible to identify the children within CERDEP districts that were in a CERDEP classroom. For the purposes of the analyses presented here, we use the CERDEP district identifier as the best available proxy for identifying CERDEP children; we refer to them here as children who attended 4K in a CERDEP district. It is important to note that this is a heterogenous group of students with different early learning experiences. While some of these children attended CERDEP, others may have attended half-day programs or other 4K classrooms with programmatic requirements that differ from CERDEP.

Demographic Characteristics

In this section, we present information on the demographic characteristics of children who attended CERDEP in private providers and children who attended 4K in CERDEP districts. The demographic characteristics include child age, gender, race/ethnicity, IEP status, and LEP status (see Appendix B for a description of these variables). We present these characteristics in Table C.1 for seven different groups of children. In the first column we present information on all children who attended 4K in CERDEP public school districts (N = 11,263). This group includes all children who we identified in CERDEP public districts and who had observed demographic data. The approximately 11,000 children attended 273 schools in the 61 CERDEP districts. (As noted in the body of the report, 64 districts were eligible to administer CERDEP, but only 61 participated). The second column, labeled as the analytic sample, includes the subset of children in CERDEP public school districts who had B3–GOLD scores at the beginning and at the end of the year. This group includes 2,491 children in 11 districts; we refer to this group as the "Public School District B3–GOLD CERDEP Analytic Sample."

As described, all children who attended a publicly funded 4K program were required to be assessed during their 4K year. While all private CERDEP providers used the B3–GOLD, public districts had the option to choose from three different assessments: the B3–GOLD, the Phonological Awareness Literacy Screening (PALS-PreK) and the Individual Growth and Development Indicators of Early Literacy (IGDIs-EL) 2nd Edition Universal Screening. According to SCDE, districts had the autonomy to choose the assessment that best fit local needs. We do not have additional information on how districts selected their individual assessment. Those that selected the B3–GOLD may be different than those that select the other two assessments.[28]

The next set of columns includes children who attended CERDEP in private providers. In the third column of the table, we present information for all children who attended CERDEP in a private provider (n = 2,353); this group includes all children present in the SCDE data set with observed demographic characteristics. Next, we present information on the analytic sample of children who attended CERDEP in a private provider (n = 1860), defined as children who attended CERDEP in a private setting for whom we had data on the teacher education levels at their centers, and who had observed B3–GOLD scores at both the beginning and end of the year. This sample is identical to that presented in Chapter 2. We also disaggregate the analytic sample by the three teacher education level categories (see Appendix B for a description of how these categories were created).

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[28] Researchers at the University of South Carolina conducted a descriptive analysis of all three of the outcome measures for all children who attended publicly funded 4K in SCDE school districts in the 2017–2018 school year. The results were reported to the South Carolina General Assembly by the EOC (see EOC, 2019).

Table C.1. Demographic Characteristics of 4K Children in CERDEP Public School Districts and Private Provider CERDEP Classrooms

Indicator	4K Children in CERDEP Districts		4K Children in Private Provider CERDEP Classrooms				
					By Share of Teachers with a BA		
	Total	Analytic Sample[a]	Total	Analytic Sample[b]	All	Some	None
Age in months (mean, s.d.)	54.2 (3.6)	54.1 (3.5)	53.9 (3.6)	53.9 (3.5)	53.9 (3.6)	53.8 (3.5)	54.0 (3.5)
Missing (percentage)	0.0	0.0	11.2	0.0	0.0	0.0	0.0
Gender (percentage distribution)							
Male	50.8	50.8	45.9	50.9	49.8	55.5	52.3
Female	49.2	49.2	46.0	49.1	50.2	44.5	47.7
Missing	0.0	0.0	8.0	0.0	0.0	0.0	0.0
Race/ethnicity (percentage distribution)							
White	36.5	39.6	24.1	25.9	24.4	33.6	27.5
Black	47.4	46.0	54.5	59.7	60.5	56.4	58.8
Hispanic	10.3	8.5	3.9	4.2	4.6	0.9	4.1
Asian	0.9	0.7	0.4	0.5	0.5	0.9	0.4
Native American	0.4	0.6	0.3	0.4	0.5	0.0	0.4
Pacific Islander	0.1	0.0	0.1	0.2	0.3	0.0	0.0
Multiracial	4.3	4.7	6.6	7.1	7.8	8.2	5.2
Missing	0.1	0.0	10.1	2.0	1.4	0.0	3.7
LEP (percentage distribution)							
Yes	7.6	4.7	0.1	0.1	0.2	0.0	0.0
No	92.2	94.0	4.8	5.3	5.0	9.1	5.2
Missing	0.3	1.3	95.1	94.6	94.9	90.9	94.8
IEP (percentage distribution)							
Yes	7.5	6.7	0.2	0.2	0.3	0.0	0.0
No	92.5	93.3	91.8	99.8	99.8	100.0	100.0
Missing	5.8	0.0	8.0	0.0	0.0	0.0	0.0
N	11,236	2,491	2,353	1,860	1,211	110	539

SOURCE: Authors' analysis of SCDE administrative data.
NOTE: s.d. = standard deviation.
[a] This analytic sample consists of 4K children in CERDEP public school districts that used the B3–GOLD assessment and who had a B3–GOLD score at both the beginning and end of the school year.
[b] This analytic sample consists of 4K children in private-provider CERDEP classrooms who had a B3–GOLD score at both the beginning and end of the school year.

When comparing with all children who attended 4K in CERDEP public school districts (the first column) with all children who attended CERDEP in private settings (the third column), the data suggest the groups have some similarities in key characteristics, including average age and gender distribution. However, the table suggests that the racial distribution differed across the two groups. Specifically, there was a higher percentage of Black children and lower percentage of White and Hispanic children in private providers compared with children who attended 4K in a CERDEP public school district. In addition, children in public districts were more likely to have an IEP (7 percent of children in public school districts versus less than one percent of children in private providers). The difference in the prevalence of children with IEPs may be explained by the fact that school districts tend to have more services available to serve children with special education needs. The data also indicate that children who were in a CERDEP public school district were more likely to be identified as having LEP; however, these data were largely missing for children in private providers. These demographic contrasts are similar when comparing only children in private settings who attended centers where all teachers had a BA with all children in the CERDEP public school districts.

It is also useful to compare all children who attended 4K in a CERDEP district, with the subsample of children from public school districts that administered the B3–GOLD. This comparison gives an indication of how representative the children who were administered the B3–GOLD are of all children in CERDEP public school districts. Indeed, the B3–GOLD sample looks similar to that of all children in the CERDEP districts on this set of characteristics.[29]

B3–GOLD Scores

In Chapter 2, we used linear probability modeling to compare the outcomes of children in private providers who attended centers where all teachers had a BA with children who attended private centers where some or no teachers had a BA, while controlling for key child and provider characteristics. We were unable to employ the same analytic techniques as in the previous section when comparing children across settings for two key reasons. First, as discussed, it was not possible to identify CERDEP children in CERDEP public school districts. Second, the provider characteristics that were observed for private providers (such as quality ratings) were not available for public school districts. Therefore, it was not possible to fit regression models adjusting for key controls. Instead, we provide a descriptive comparison of children's outcomes. In Table C.2, we present B3–GOLD scores for the public school district B3–GOLD CERDEP sample and the private provider analytic sample—for the total sample and broken down by teacher education level. In the top panel, we present scores for the B3–GOLD language outcome; in the bottom panel, we present the literacy outcome. For each outcome we present the

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[29] Children in the B3–GOLD sample were slightly less likely to have LEP than the full public school district sample (4.5 percent of children as compared with 7 percent).

Table C.2. Beginning- and End-of-Year B3–GOLD WHE Scores for the Analytic Samples of the 4K Children in CERDEP Public School Districts and in Private Provider CERDEP Classrooms

Indicator	4K Children in CERDEP Districts — Analytic Sample[a]	4K Children in Private Provider CERDEP Classrooms — Analytic Sample[b]	By Share of Teachers with a BA — All	Some	None
B3–GOLD: Language					
Beginning-of-year WHE score (percentage distribution)					
Meets or exceeds expectations	27.1	45.1	47.1	35.5	42.5
Below expectations	72.9	54.9	52.9	64.5	57.5
End-of-year WHE score (percentage distribution)					
Meets or exceeds expectations	86.3	85.0	86.5	82.7	82.0
Below expectations	13.7	15.0	13.5	17.3	18.0
N	2,491	1,860	1,211	110	539
B3–GOLD: Literacy					
Beginning-of-year WHE score (percentage distribution)					
Meets or exceeds expectations	28.3	51.3	51.0	40.0	54.4
Below expectations	71.7	48.7	49.0	60.0	45.6
End-of-year WHE score (percentage distribution)					
Meets or exceeds expectations	94.5	90.8	90.9	86.4	91.5
Below expectations	5.5	9.2	9.1	13.6	8.5
N	2,490	1,857	1,208	110	539

SOURCE: Authors' analysis of SCDE administrative data.
[a] This analytic sample consists of 4K children in CERDEP public school districts that used the B3–GOLD assessment and who had a B3–GOLD score at both the beginning and end of the school year.
[b] This analytic sample consists of 4K children in private provider CERDEP classrooms who had a B3–GOLD score at both the beginning and end of the school year.

percentage of children who met or exceeded expectations, and the percentage of children who fell below expectations at both the beginning and end of the school year.

Across both the language and literacy outcomes, a smaller percentage of children who attended a 4K program in a CERDEP public school district met or exceeded age-level expectations at the beginning of the year, compared with CERDEP children who attended private providers. This conclusion holds when looking at the total private provider analytic sample and each teacher education group. For example, 47 percent of children who attended private providers where all teachers had a BA met or exceeded expectations on language scores in the fall, compared with only 27 of children who attended 4K in a CERDEP district. The pattern is similar when looking at children's literacy scores. These data suggest that children who attend

4K in a CERDEP public school district that administered the B3–GOLD were less likely to start their 4K year meeting age-level expectations, compared with children who attended CERDEP in private settings.

However, by the end of the year, there were few differences in the percentages of children meeting or exceeding expectations in private providers and public school districts. For the language outcome, the percentages of children meeting or exceeding expectations among children who attended private providers and children who attended 4K in CERDEP public school districts were similar. Indeed, the percentages of children meeting or exceeding expectations in the public school districts and the private providers where all teachers had a BA were nearly identical at 86 percent. The pattern is similar when looking at the literacy outcome. Though, in this case, a slightly higher percentage of children who attended 4K in a CERDEP public school district met or exceeded expectations (about 94 percent) compared with children in the private centers (about 90 percent).

These results suggest that children who attended 4K in a public school district started off the 4K year with lower skill levels, but caught up to children who attended CERDEP in private providers by the end of the school year. These observed differences could be explained by a number of factors. As noted, the heterogeneity in the public school district group must be considered. The variability in children's 4K experience may drive the differences in outcomes. Or, as indicated in Table C.1, the children in public school districts were more likely to have IEPs; this difference may explain the lower percentage of children meeting expectations at the start of the year. In addition, there are many important demographic characteristics not included in the SCDE data set—family income or parent education level, for example. These or other unmeasured differences between the groups could have driven the variation in the outcomes.

Finally, as described in Appendix B, the B3–GOLD is not a direct assessment of child skills; rather, the scores are derived from teacher reports of children's skills based on observations and interactions with children in the classroom. It is possible that teachers across public and private settings employ the assessment tool differently, leading to variation in child outcomes. Indeed, new research focused on an older version of a Teacher Strategies GOLD school readiness assessment suggests that teachers' use of the assessment tool may not be effective for discriminating between the skills of children in a single classroom (Russo et al., 2019). Thus, the tool may be limited in its ability to compare children across classrooms and thus across private and public settings.

Appendix D. CERDEP Professional Development Key Informant Interview Protocol

CERDEP Professional Development Interview Protocol

Professional Position and Organization's Role in PD

1. Within [organization] can you tell me a little bit about your role and what your official title is?

2. Can you tell me a little bit about the professional development services offered by [INSERT NAME OF ORG] provided to lead and assistant teachers?
   a. What is your role in this process? Do you directly provide PD or facilitate sessions?
   b. FOR CCCCD—how do you approve PD? What does the process look like?

3. We know some about the professional development requirements in the state; however, can you talk to us a little about these requirements and whether, based on your understanding, these requirements differ by private or public CERDEP providers?
   a. Can you tell us how state or district policies or offerings may differ? Is there a lot of variation across districts/private providers?
   b. Do certain types of centers (e.g., Head Start) or regions have different policies/offerings and how do these vary across programs/regions?
   c. How does coaching fit in the model?
   d. Are there differences in requirements for online PD vs. in-person PD?
   e. FOR PUBLIC PROVIDERS—Who at the public school site is considered a director, and do they need the 20 hours of PD to meet state requirements?

4. How, if at all, do you use the Learning Forward: Standards for Professional Learning?

5. What other organizations, apart from yours, provide PD to lead and assistant teachers? Can you explain how the process works for teachers to sign up or select PD sessions to attend?

Tracking Professional Development

6. How does your organization, if at all, track attendance in PD sessions? Is this the same no matter the format (e.g., online versus in-person; coaching or workshop)?
   a. Do districts/centers track teacher PD and how it meets CERDEP requirements by person or center/district?

7. IF PD IS TRACKED: Can you tell me what elements of PD are tracked? For example, do you track PD content, length, type, location, instructor, et cetera?
    a. If possible, could you send us a screenshot or example file of how PD is tracked?

8. Are lead and assistant teacher PD hours tracked over time, so you can see whether requirements are met?
    a. If so, how do you track these sessions or workshops over time?
    b. Is PD tracked across sites, meaning that if a teacher moves to a new center, do the PD hours follow them? Or are they center-specific?

9. Does another organization track PD hours for teachers? For example, like CCCCD? If so, could you tell me a little about the process?

Professional Development Funding and Costs

10. Can you tell me a little bit about how PD offered by your organization is funded?
    a. Are costs reimbursed by any organization?
    b. Do you know if the state covers any of the costs?

11. Do teachers have to pay for any of the PD? If so, are they/the centers reimbursed for any amount?

Final Questions

12. Any other items or topics around CERDEP PD that I should know about or that we should discuss?

13. Are there any helpful CERDEP PD documents or websites that I should know about or that you can send to me?

Thanks for your time!

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