



PROFESSIONAL DEVELOPMENT LITERATURE SUPPORT SUMMARY

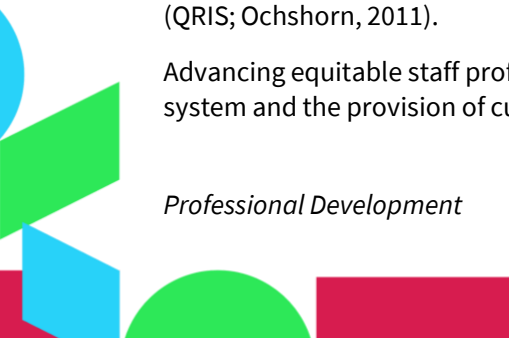
I. Definition, Description, and Example of Element

Professional development (PD) and workforce development are cornerstones of high-quality pre-K (Gardner et al., 2019; Hyson & Whittaker, 2013; Institute of Medicine & National Research Council [IOM & NRC], 2015). Professional development in early childhood refers to experiences that promote the education, training, and learning of early childhood practitioners that increase the quality of their work with young children from birth to age 8 and their families (Sheridan et al., 2009). These teaching and learning experiences can range from formal college coursework to more informal opportunities such as technical assistance, coaching, consultation, mentoring, and communities of practice (National Professional Development Center on Inclusion [NPDCI], 2008).

More formal types of professional development usually occur in higher education institutions (e.g., community colleges, four-year colleges and universities, and graduate schools). These courses typically cover content in areas such as child development, early learning, and instruction, include field experiences, and lead to college credits and degrees (IOM & NRC, 2015). Other types of professional development are job-embedded, meaning they take place during ongoing practice in the workplace. These types of training may include specialized training that focuses on specific skills, coaching, or consultation to support the implementation of teaching practices, and communities of practice, where educators and professional development trainers share knowledge and experiences with their peers (Sheridan et al., 2009). More recently, the term *professional learning* has also been used to differentiate short-term or one-time professional development training opportunities from experiences, such as year-long in-service trainings or professional learning communities, that are ongoing, collaborative, and recognize teachers as learners, leaders, and knowledgeable professionals (Cabusao et al., 2019; O'Brien & Jones, 2014).

A broad range of professional development activities are needed to address the diversity of the early childhood workforce, which includes professionals from various disciplines (e.g., education, disability specialists, social workers, and mental health professionals) and who also work in different types of organizations (e.g., Head Start, child care, pre-K, preschool, and public school programs; Early et al., 2007; Yoshikawa et al., 2013). These professionals are widely diverse in qualifications and education, ranging from bachelor's or higher degrees to limited formal schooling (IOM & NRC, 2015; NPDCI, 2008), with professionals working in state-funded pre-K programs more likely to have earned bachelor's degrees compared to educators working in other types of settings (Whitebook et al., 2018). With regard to professional development, the Implementation Development Map (IDM) focuses on state-level infrastructure indicators that address competency requirements, incentives, and resources for degree and accreditation as well as standards for job-embedded professional learning (JEPL). This approach helps states ensure that core knowledge and competencies for degrees and accreditation are aligned with state early learning guidelines and linked to states' Quality Rating and Improvement Systems (QRIS; Ochshorn, 2011).

Advancing equitable staff professional development requires an affordable and accessible higher education system and the provision of customized support and incentives (Austin et al., 2011; Whitebook et al., 2018).





Many working educators are able to earn a college degree when provided supports, such as classes at non-traditional hours in accessible locations, tutoring, English-language assistance, computer training, and financial support (Sakai et al., 2014). Professional development systems that offer diverse pathways for practitioners to enter at various levels and advance in their careers are more accessible and effective (IOM & NRC, 2015). States can offer incentives and supports to ensure equitable access and collect data on workforce professional development to identify unique barriers and inform policy and funding decisions to support a diverse and well-prepared workforce (LeMoine, 2008; Power to the Profession Task Force, 2020; Start with Equity, 2020).

The IDM also includes implementation indicators that address ongoing job-embedded training and supports for educators and instructional leaders. JEPL opportunities are most effective when they are affordable, accessible, and lead to career advancement (Hyson & Whittaker, 2013). Research recommends that content be responsive to the diverse needs of children and families and include areas of administration for instructional leaders (Ryan et al., 2011; Talan et al., 2014). Much of the current knowledge of effective ECE job-embedded professional learning comes from small-scale studies of specific interventions, limiting the information on large-scale professional learning efforts that policymakers could standardize (Gomez et al., 2015). The research base does, however, contain several themes of effective professional learning. Research-based, comprehensive, sustained, and intensive approaches to professional learning are more effective than short-term interventions (IOM & NRC, 2015). Approaches that combine instruction with guided practice and feedback from coaches have been found to be effective (Isner et al., 2011; Gupta & Daniels, 2012; Sheridan et al., 2009; Son et al., 2013; Whitebook et al., 2009). Importantly, professional learning efforts are effective when aligned with the specific standards and context of the ECE organization (LeMoine, 2008).

The Professional Development Element of the IDM measures state-level infrastructure indicators as well as classroom and program level implementation indicators. Equitable infrastructure indicators focus on state systems, policies, and practices that support high-quality pre-K. The infrastructure indicators appear at the beginning of the Element and are labeled as policy (e.g., established in policy and statewide standards), supports (e.g., dedicated resources), and data (e.g., data collection standards and protocols and data use). Equitable implementation indicators focus on the degree to which high-quality pre-K practices occur at the program level and who is benefitting. These indicators require active data collection based upon a representative sample to ensure that all subpopulations are progressing and experiencing the benefits of improvement efforts. Below we list the infrastructure and implementation indicators that make up the PD Element.

PD1. Core Knowledge and PD Standards

The early childhood PD system includes research-based core knowledge and competencies that are equitable and easily accessible. PD providers are monitored to ensure they meet specific standards.

The PD system includes the following four essential criteria:

- Founded on research-based core knowledge and competencies
- Equitable in its design and modes of delivery (i.e., PD materials are translated in languages representative of the field, PD opportunities take geographical barriers into account, content is inclusive of all children and families)
- Accessible (i.e., offered in diverse formats to meet the needs of the field - online, in person, accessible for early childhood educators with disabilities – Section 508 compliant)



- Monitoring of PD providers through a professional standards board, accreditation process, or other quality assurance mechanisms

PD2. Ongoing PD: Requirements and Incentives

State has requirements related to ongoing PD. The requirements are research-based. There are clear guidelines and incentives (e.g., points in a grant system, points in a quality rating and improvement system (QRIS) rating, PD credit, etc.) to support teachers, aides, and instructional leaders to engage in ongoing PD pre- and post-degree attainment. Incentives are equitable and are customized to meet the needs of individuals such as individual PD vs. group PD, frequency, PD hours, etc.

PD3. Job-Embedded PD Resources

State provides ongoing, accessible, and equitably distributed resources, training, and funding to support the implementation of JEPL. Examples of ongoing, accessible, and equitably distributed resources include:

- Written guidance, funding, technical assistance, training, coaching, consultation, on-the-job training, etc.
- Materials and tools that are accessible in languages that represent the field, are 508 compliant for early childhood educators with disabilities, and are delivered in various mediums

Funding may also support instructional leadership roles and JEPL.

- Funding may cover one-time trainings, ongoing trainings, or pilots or innovations.
- Existing program funds may be used to cover costs.

PD4. Workforce Development

Degree requirements for teachers are appropriately rigorous and are integrated into a career lattice. There are supports for those of diverse backgrounds to attain further education credentials, and all four of the following characteristics or requirements are true:

- All teachers are required to have an early childhood education credential (e.g., Child Development Associate (CDA), Associate of Arts (AA) in early childhood education).
- All teachers are required to have a bachelor's degree.
- A formal career lattice outlines how different types and levels of educational attainment and years of experience can lead early childhood educators to new roles and opportunities.
- State-funded supports are established for those with diverse racial, lingual, and socioeconomic backgrounds to attain higher levels of early childhood education credentials.

PD5. PD Data Collection and Use

State collects JEPL data on early learning professionals' race, income, and language; data are gathered and used in the following five ways:

- State collects data using tracking tools, program evaluation tools, early childhood educators surveys, and local level reports.
- State verifies the implementation of JEPL through monitoring, use of an online platform, or directly collecting early childhood educators surveys.
- State uses JEPL data for accountability and improvement.

- A quality assurance mechanism monitors the quality of JEPL provided to teachers and instructional leaders.
- State uses multiple sources of data to inform improvement plans and track progress and uses the data to guide technical assistance and resources to local programs.

PD6. PD Data Collection for Equity Goals

The state's efforts to understand and address inequity with regard to policies and practices around early learning core knowledge and PD standards, ongoing PD requirements and incentives, job-embedded PD standards and resources, and workforce development includes ongoing data collection, disaggregation of data, active discussions, data-driven decision-making, action planning, implementing, assessing implementation, and refining as needed.

The state specifically collects data to understand and address the following four components:

- The barriers to accessing affordable PD opportunities (Access includes location of available PD, language, 508 compliance, and diversity of trainers.)
- The need for PD opportunities that reflect teachers' or providers' diversity, and include voices and experiences of diverse teachers and providers
- The need for PD content that is comprehensive and meets the needs of all teachers (i.e., content is varied and supports teachers to engage with children from all backgrounds)
- Demographic differences in degree or credential attainment, and challenges to career advancement especially for populations of color, low-income, and dual language learners

PD7. Prevalence of Job-Embedded PD

Teachers receive job-embedded professional learning (JEPL).

PD8. Instructional Leadership Supports

Regional and local instructional leaders report receiving training and ongoing support in instructional leadership practices including the following:

- Leading data informed continuous quality improvement (CQI) processes

Organizing and facilitating job-embedded professional learning

Ensuring coherent instructional guidance and systems to support teacher practice

Creating systems and support for family engagement practices

Including teachers and families in decision making

Addressing and ensuring equity

Building a trusting and supportive environment among all in the program community

PD9. Affordability and Accessibility

PD opportunities are affordable and accessible.

PD10. Cultural and Linguistic Responsiveness

PD opportunities are culturally and linguistically responsive to the needs of early childhood educators.



PD11. Relevance and Effectiveness

PD opportunities support development of core competencies sought by both pre- and post-degree early childhood educators.

II. Descriptive Summary of Professional Development Sources Included as Evidence

To understand the existing literature support and identify the literature gaps and limitations for each of the IDM indicators, we conducted a systematic literature search and checked with experts for relevant sources to support the various indicators of PD. More details of the general review process conducted across all elements can be found in the [IDM Evidence Review Document](#). For the PD Element, 21 key phrases were identified and explored. Out of these initial phrases, 16 key phrases retrieved relevant results. The list of all sources that yielded relevant results based on the 16 key phrases and expert recommendations, along with five key phrases that did not yield relevant results, can be found in Appendix A.

Once the literature search for the PD Element was completed, we reviewed the quantity and rigor of the literature supporting each indicator and computed what we termed the Literature Support Index (LSI). The LSI is calculated for each indicator based on seven components:

1. at least three peer-reviewed articles;
2. at least one study with no more than two limitations;
3. at least one study at national or state level;
4. at least one study that uses experimental or quasi-experimental design;
5. at least two studies that use representative sampling;
6. support from at least one national research organization; and
7. support from at least one national policy organization.

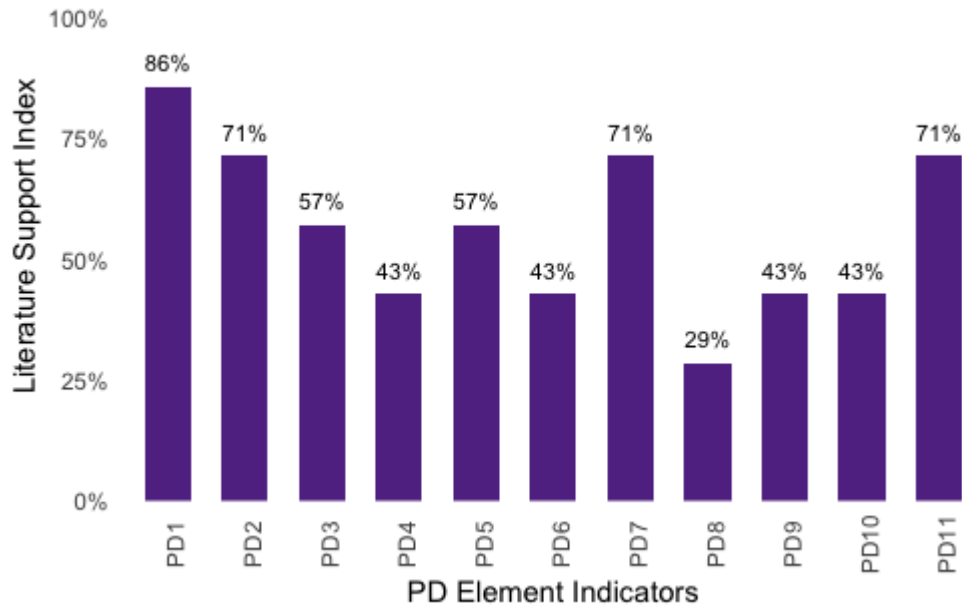
The LSI is expressed as a percentage of the above seven criteria that are satisfied for a particular indicator. More information about the rationale for the LSI and how it is calculated can be found in the IDM Evidence Review Document. Figure 1 summarizes the LSI for the PD Element indicators.





Figure 1

Overall Summary of PD Literature Support Index

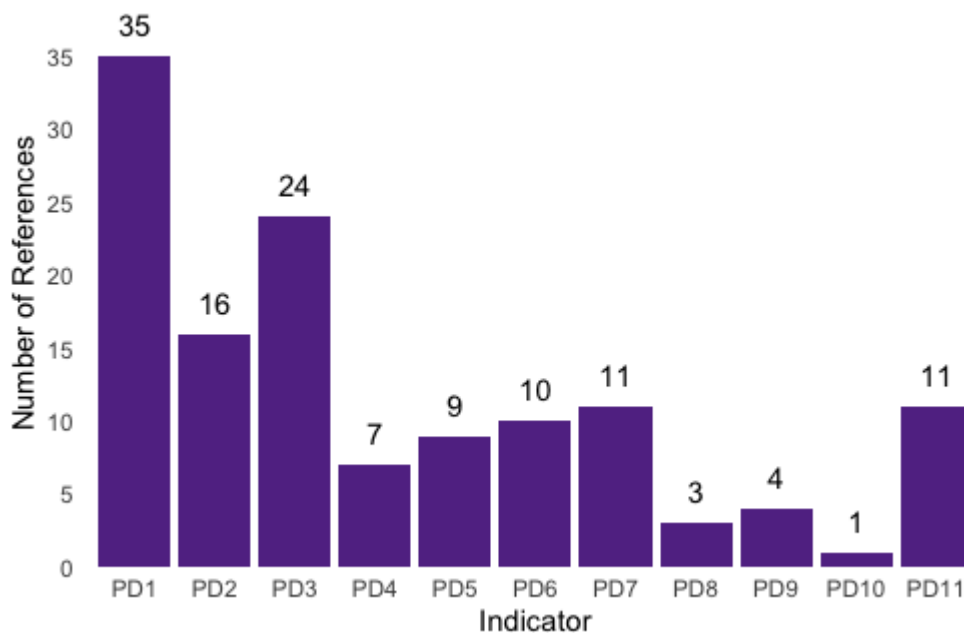




While Figure 1 combines aspects of both rigor of the literature and quantity supporting each indicator, Figure 2 presents solely the quantity of evidence for each indicator. Figure 2 shows that PD Indicator 1 is supported by a larger number of sources than the rest of the indicators. We hope that this type of analysis can help state teams understand where there are gaps in research and potential directions for future studies. For example, PD 10 is under-researched by academics and would be an ideal focus for state teams' CQI, DDDM, or RPP efforts.

Figure 2

PD Quantity of Evidence by Indicator

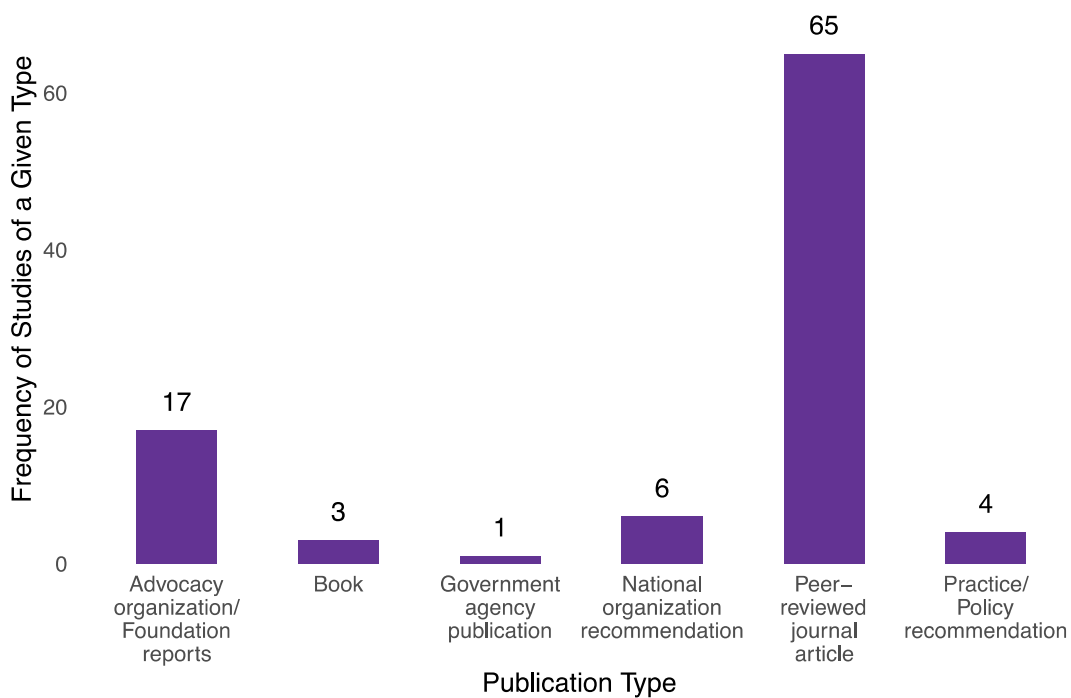




To understand more about the nature of the literature that supports the Element, Figure 3 lists the types of publications used as evidence for the indicators of the PD Element; the vast majority of the sources are articles from peer-reviewed journals (65).

Figure 3

PD Evidence by Publication Type





In addition to types of publications, Figure 4 summarizes the research design used in the sources supporting the PD Element. The most common type of research designs represented in the PD literature scan (35) involved a literature review conducted by academic researchers. Other common study design approaches were experiments (11), pre-post association studies (10), mixed-methods studies (9), qualitative studies (9), and quasi-experimental studies (8).

Figure 4

PD Summary of Research Design

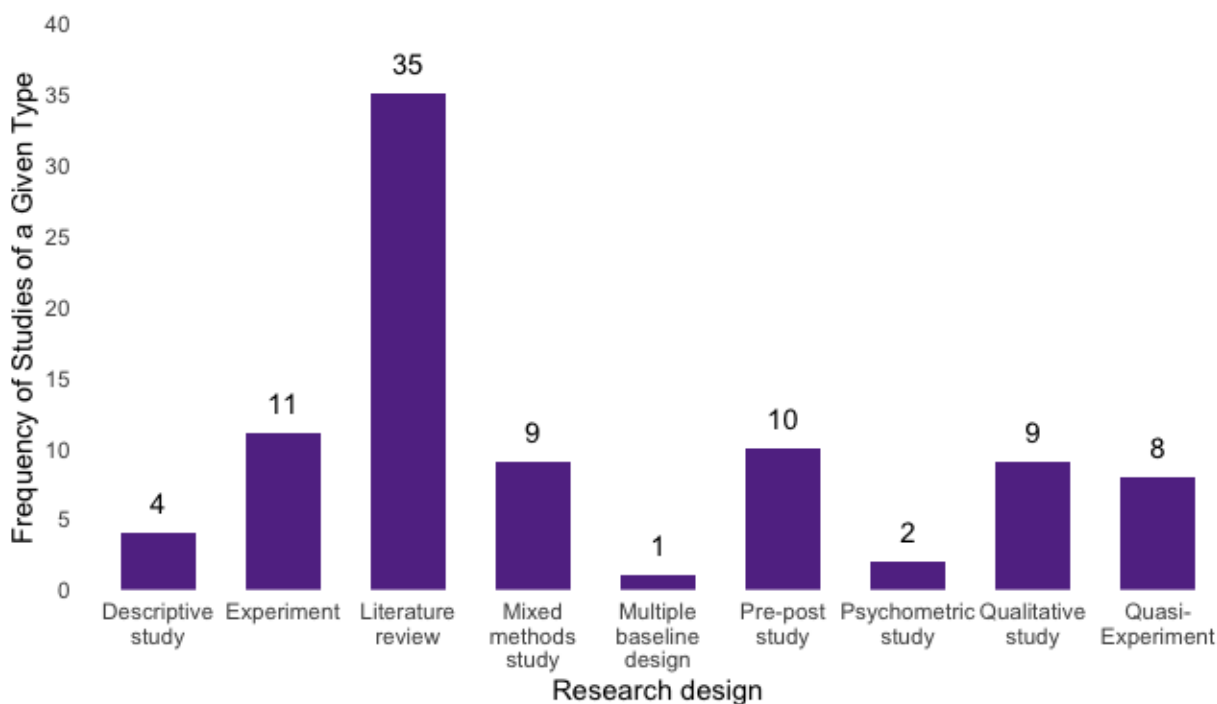




Figure 5

PD Child Outcomes Studies Examined

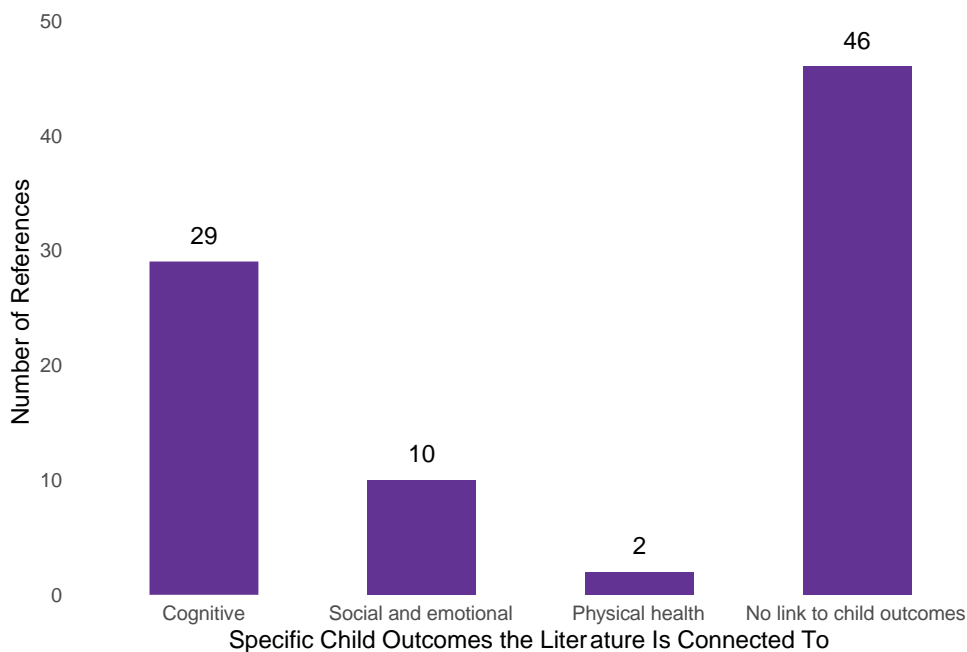


Figure 5 summarizes the professional development literature reviewed for the IDM and identifies articles that involved examining child outcomes in their studies. Professional development–related studies that included child outcomes compared to those that did not were fairly evenly split. Of the studies that connected child outcomes to professional development, the majority were cognitive outcomes, followed by social and emotional and finally child physical health.

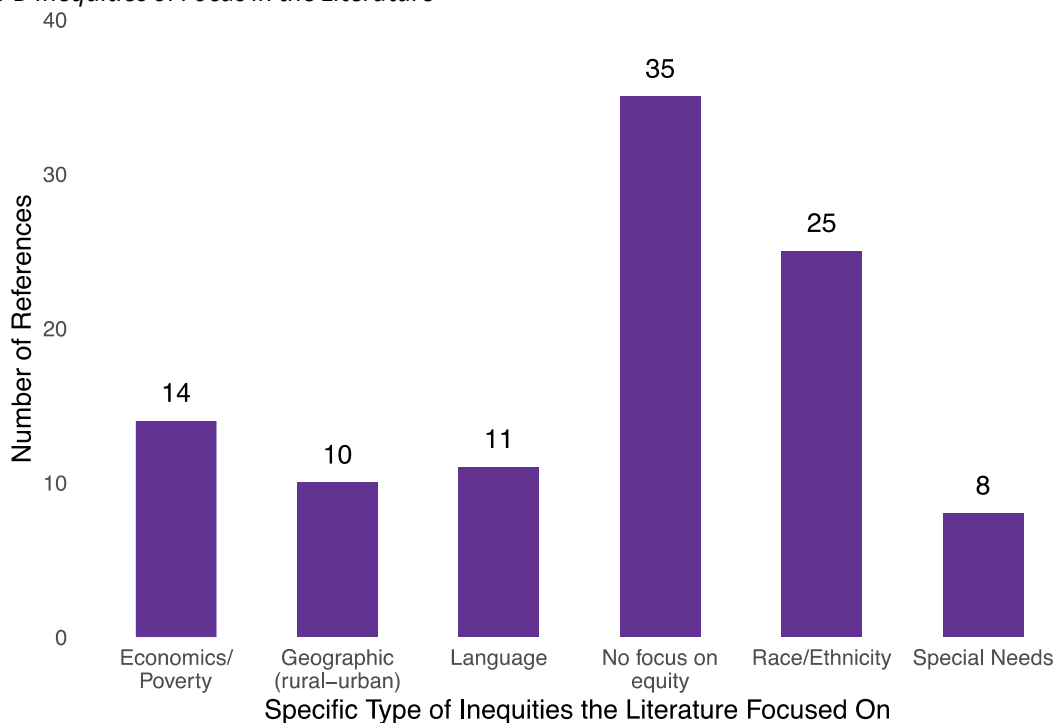




Figure 6 shows how many PD studies focus on equity and which type of equity they focus on. Overall, only 35 studies have no focus on equity whatsoever, and this roughly correlates with how many do not examine child outcomes (see Figure 5). The remaining studies focus mostly on racial equity (25), economic equity (14), and DLLs (11).

Figure 6

PD Inequities of Focus in the Literature





III. Summary of PD Literature Supporting Indicators: Current Practices and Challenges

This section provides a summary of the literature supporting each indicator, including the current practices and challenges. Because some of the infrastructure and implementation indicators cover the same topics at the state and program level, we have grouped our summary together to reflect the overlap in the literature for these indicators.

Professional Development Infrastructure Indicators (state level)

PD1. Core Knowledge and PD Standards

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- Monitoring of PD providers through a professional standards board, accreditation process, or other quality assurance mechanisms

The core knowledge and professional development standards indicator focuses on ensuring professional development systems are equitable, easily accessible, and based on research-based core knowledge and competencies. This indicator also helps ensure that PD providers are monitored through quality assurance mechanisms.

The National Child Care Information Center (2006) provides the definitions of core knowledge and core competencies. Core knowledge is defined as “the central concepts that adults who work with young children need to know and understand to facilitate children’s learning and development, which are linked to early learning guidelines” (National Child Care Information Center, 2006, p. 2). Core competencies are defined as “the central range of observable skills that adults who work with young children need to facilitate children’s learning and development, which are linked to early learning guidelines” (National Child Care Information Center, 2006, p. 2). Another important definition is provided by LeMoine (2008), who states that “professional standards define the what, or the content, of professional preparation and ongoing development” (p.13). LeMoine (2008) recommends that states develop policies around professional standards that specify qualifications and ongoing development required for all early care and education professionals. These requirements should address varying levels and content of education and include detailed career-pathway policies that align and connect



content for a broad range of teaching, training, and administrative roles (Meek et al., 2020; Power to the Profession, 2020).

Early childhood staff need a fundamental understanding of the stages of child development, and professional development standards support staff developing this knowledge. However, additional research is needed on the intensity, duration, and content of professional development that has the greatest effect on professionals' practice. Research recommends state PD standards be linked with QRIS in order to apply the PD, and to encourage high levels of preparation and use of the PD among staff in early childhood education programs. Research also recommends the PD standards set expectations for early childhood workforce quality across all program types (state-funded pre-K, Head Start, and child care). State policies should specify the levels and content of ongoing PD as requirements for professionals to fulfill their job responsibilities and maintain current knowledge and skills (Demma, 2010).

States are increasingly aligning PD standards and activities with an established set of core competencies (Whitebook et al., 2009). In the early childhood education field, there is strong consensus on the importance of at least four core competencies: 1) child development; 2) relationships; 3) program management; and 4) observation and assessment (Marshall et al., 2005). Le Moine (2008) recommends that core professional knowledge addresses cultural competence and diversity, and integrates general and special education. These core competencies and knowledge need to be integrated into coordinated professional credentialing, licensing, and training processes for early education and care staff (Marshall et al., 2005).

Professional Development Infrastructure Indicators (state level)	Professional Development Implementation Indicators (classroom and program level)
<p>PD2. Ongoing PD: Requirements and Incentives State has requirements related to ongoing PD. The requirements are research-based. There are clear guidelines and incentives (e.g., points in a grant system, points in a quality rating and improvement system (QRIS) rating, PD credit etc.) to support teachers, aides, and instructional leaders to engage in ongoing PD pre- and post-degree attainment. Incentives are equitable and are customized to meet the needs of individuals such as individual PD vs. group PD, frequency, PD hours, etc.</p>	<p>PD 7. Prevalence of Job-Embedded PD Teachers receive job-embedded professional learning (JEPL).</p> <p>PD 8. Instructional Leadership Supports Regional and local instructional leaders report receiving training and ongoing support in instructional leadership practices including the following:</p> <ul style="list-style-type: none"> ● Leading data informed continuous quality improvement (CQI) processes ● Organizing and facilitating job-embedded professional learning ● Ensuring coherent instructional guidance and systems to support teacher practice ● Creating systems and support for family engagement practices ● Including teachers and families in decision making ● Addressing and ensuring equity ● Building a trusting and supportive environment among all in the program community





Teacher Incentives

Increasing numbers of early childhood education teachers are participating in professional development in pursuit of a degree. Whitebook et al. (2009) recommend conducting rigorous research around publicly funded professional development strategies to ensure they are effective in improving teacher performance and ultimately child outcomes. Professional development that combines multiple strategies appears to be more successful in improving outcomes. A study by Landry et al. (2009) across four states and 158 schools found that professional development that used a combination of online courses and mentoring with detailed, instructionally linked feedback by a trainer or coach showed the best child outcomes compared to groups with other teaching supports. The study found that children with teachers who received this combination of professional development support showed better performance on phonological awareness, expressive vocabulary, and print and letter knowledge, compared to teachers in the program who did not receive this combination of professional development.

There are many different forms of incentives for early childhood educators that vary state by state. According to Austin et al. (2011), scholarships for higher education classes are the most common way programs use individual financial incentives to support teachers in attaining professional development, especially when college degrees are required. Other forms of incentives include educators being paid bonuses or stipends, which can constitute a sizable supplement to an individual's income (Austin et al., 2011). A study by Wasik and Hindman (2020) showed the significant role incentives can play in professional development intervention and improving child outcomes. The study involved preschool teachers from a high-poverty, urban school district. The teachers were trained to implement Story Talk, a reading intervention designed to increase children's vocabulary and language development. The professional development intervention also involved teacher incentives, which included \$500 for participating, and teachers got to keep all the classroom materials used in the intervention. Results from this study suggested that teachers in the intervention increased the quality of their instruction, fidelity of the project's strategies, and their use of target vocabulary. Further, children in the intervention group significantly increased vocabulary development.

Leader Incentives

There is broad consensus among policymakers and practitioners about the importance of strong leadership in early childhood education. However, a large proportion of center directors and school principals assume their leadership positions without prior professional backgrounds or training in early education and/or administration (LeMoine, 2008; Szekely, 2013; Talan et al., 2014) and there is a scarcity of research related to providing leaders with incentives for completing training in early childhood education. This is a concern, as principals without appropriate training, for example, may unknowingly promote classroom strategies that mimic those used to teach older students but are developmentally inappropriate for younger students (Ehrenberg et al., 2012). In a National Governors Association paper, Szekely (2013) recommends revising state leader standards and licensure requirements to build the capacity of elementary school principals as pre-K through third grade (P-3) leaders. States can also expand state accreditation criteria for principal preparation programs, to include content on P-3 pedagogy and support professional development for existing principals and other leaders on how to promote high-quality P-3 instruction.

Professional development opportunities for leaders need to focus on both administration and early childhood content. Ryan et al. (2011) conducted interviews on professional development needs with directors of Head Start and child care programs in New Jersey and found that directors ranged widely in qualifications, expertise,





and experiences. Based on these findings, Ryan et al. (2011) recommended that policy makers and administrators use needs assessments to tailor professional development to the particular needs of their preschool directors. Because of the complexity of leading programs with mixed sources of funding and policy mandates, Ryan et al. (2011) also recommended that unique competencies be articulated for preschool leaders and that institutions of higher education develop leadership preparation programs specific to early childhood. PD programs that focus on individual, organizational, and systemic change and the program director's role as a change agent have resulted in positive outcomes. Talan et al. (2014), for example, examined the effectiveness of Taking Charge of Change (TCC), a 10-month training program for preschool leaders, and found evidence of individual growth and organizational improvement as well as positive program outcomes relating to accreditation status and participation in Illinois' quality rating system. Participants also reported experiencing the greatest growth in their knowledge of how systems theory applies to early childhood organizations, and in how to implement an individualized model of staff development. In addition, participants reported higher self-esteem, greater confidence, and a stronger sense of self-efficacy as a result of participating in the training.

Professional Development Infrastructure Indicators (state level)	Professional Development Implementation Indicators (classroom and program level)
<p>PD3. Job-Embedded PD Resources State provides ongoing, accessible, and equitably distributed resources, training, and funding to support the implementation of JEPL. Examples of ongoing, accessible, and equitably distributed resources include:</p> <ul style="list-style-type: none"> ● Written guidance, funding, technical assistance, training, coaching, consultation, on-the-job training, etc. ● Materials and tools that are accessible in languages that represent the field, are 508 compliant for early childhood educators with disabilities, and are delivered in various mediums <p>Funding may also support instructional leadership roles and JEPL.</p> <ul style="list-style-type: none"> ● Funding may cover one-time trainings, ongoing trainings, or pilots or innovations. ● Existing program funds may be used to cover costs. 	<p>PD9. Affordability and Accessibility PD opportunities are affordable and accessible.</p> <p>PD10. Cultural and Linguistic Responsiveness PD opportunities are culturally and linguistically responsive to the needs of early childhood educators.</p>

These three indicators focus on JEPL resources with regard to funding and training support, availability and affordability, and quality of resources in terms of cultural and linguistic responsiveness. Effective implementation of JEPL requires a comprehensive and coherent state-wide infrastructure of resources and supports that are affordable, accessible, culturally and linguistically responsive, and equitably distributed to providers (IOM & NRC, 2015). Financial constraints faced by both public and private programs, and by the ECE



financing structure itself, have limited the capacity of states to provide comprehensive and equitable PD opportunities (Whitebook, 2014). To ensure that monies are directed where they are most needed, states need to develop a strategic plan for financing and resource allocation that takes into account funding from multiple public and private sources. For example, LeMoine (2008) recommends that state policies support the financing of integrated professional development systems in four specific areas. First, allowing early childhood professionals to pursue education and ongoing professional development based on need. Second, having funding for programs to facilitate professional development through resources for release time and substitute staff, teacher mentors and coaches, purchase of materials and equipment, and other supports. Third, providing explicit rewards and compensation parity for attainment of additional education and development. This includes financing mechanisms such as higher reimbursement rates and grants that reflect the cost of quality and do not always take into account or sufficiently address the cost of compensation parity. Finally, policies related to financing of the professional development system infrastructure, which may be linked to and/or embedded in the state's larger early childhood system. Infrastructure pieces that require financing may include the advisory body, data systems, support to higher education institutions and training systems, and quality assurance processes (LeMoine, 2008).

Higher Education

Ensuring young children have teachers with degrees in ECE begins with an affordable and accessible higher education system (Russell, 2012). However, the supply of affordable and accessible educational opportunities to train educators in advancing levels of competence is often inadequate (Kagan et al., 2007). Major differences exist in PD infrastructure opportunities especially between educators in better-funded, school-sponsored public pre-K and Head Start programs, who are more likely to participate in on-the-job learning opportunities that occur during their paid working hours compared to educators in privately operated and funded programs, who are more often expected to complete professional development or college courses during unpaid evening or weekend hours (Whitebook, 2014). Even in states where adequate training opportunities exist, they are often inaccessible to ECE workers because of the distance, schedule, or cost of the training opportunities (Kagan et al., 2007). Although community colleges are generally more suited to providing accessible and affordable education for teachers compared to four-year colleges, they rarely offer sufficient courses that meet the practical needs of working students (Russell, 2012). Marshall et al. (2006) address the need for JEPL opportunities to accommodate for limited financial resources, the need for career counseling, the need for general academic and literacy support, language barriers in a diverse workforce, unique needs of adult learners, and scheduling and location difficulties. For example, in findings from a study that examined challenges in hiring teachers with formal degrees in Michigan's Migrant Head Start programs, Rosenbaum et al. (2006) recommend using teacher demographic information to develop and disseminate workforce development materials, and to accommodate teachers' financial and scheduling needs in order to facilitate their education without compromising child care quality. Further, partnerships between early learning programs and higher education institutions can be strengthened so that high-quality early childhood PD programs are more widely available and readily accessible. For example, community educational institutions and Head Start centers can work together to schedule classes at times that accommodate teachers' needs (Ponder, n.d.; Rosenbaum et al., 2006).

Coaching

One key way in which JEPL can be supported is through coaching. In the early education field, sustained coaching approaches, combined with coursework, have been shown to improve teacher and child outcomes



(Landry et al., 2009; Neuman & Cunningham, 2009). Coaching is defined as a relationship-based process led by an expert to build a practitioner’s capacity for specific professional dispositions, skills, and behaviors (Snyder et al., 2015). Several early childhood professional development interventions have coaching playing a central role in program delivery and training support (Ansari & Pianta, 2018; Crawford et al., 2017). Practice-based coaching (PBC) is a specific type of coaching that incorporates components of research-based PD standards, PD competencies, and adult learning theories. PBC differentiates itself from other early childhood coaching models because of its explicit focus on teaching practices and a framework which includes collaborative partnerships, needs assessments, goal setting, action planning, focused observation, reflection and feedback, and cyclical process. PBC has been used to promote educators’ implementation of the Pyramid Model and has been found to be associated with an increase in children’s social skills and a decrease in challenging behaviors (Hemmeter et al., 2016). In addition, researchers are exploring various ways to deliver coaching, including video calls, the use of online platforms, email, or a combination of these methods to increase accessibility and affordability compared to in-person coaching (Artman-Meeker et al., 2014; Barton et al., 2015; MacLeod et al., 2019).

Professional Development Infrastructure Indicators (state level)	Professional Development Implementation Indicators (classroom and program level)
<p>PD4. Workforce Development Degree requirements for teachers are appropriately rigorous and are integrated into a career lattice. There are supports for those of diverse backgrounds to attain further education credentials, and all four of the following characteristics or requirements are true:</p> <ul style="list-style-type: none"> ● All teachers are required to have an early childhood education credential (e.g., Child Development Associate (CDA), Associate of Arts (AA) in early childhood education). ● All teachers are required to have a bachelor's degree. ● A formal career lattice outlines how different types and levels of educational attainment and years of experience can lead early childhood educators to new roles and opportunities. ● State-funded supports are established for those with diverse racial, lingual, and socioeconomic backgrounds to attain higher levels of early childhood education credentials. 	<p>PD 11. Relevance and Effectiveness PD opportunities support development of core competencies sought by both pre- and post-degree early childhood educators.</p>

Several reviews of the literature support a strong association between teacher qualifications and early childhood program quality (Eckhardt & Egert, 2020; Kelley & Camilli, 2007; Manning et al., 2017). Some studies have also found teacher qualification to have a positive impact on children’s outcomes (Burchinal et al., 2002; Pianta et al., 2005). Kim et al. (2011), for example, found that dual language learner (DLL) preschoolers with





teachers of higher educational levels demonstrated significantly higher early math competency, compared with their peers with teachers of lower educational background. Teacher qualifications are thought to influence child outcomes through a mediated path (Ackermann & Barnett, 2006; Eckhardt & Egbert, 2020; NICHD, 2002; Pianta et al., 2009). Teachers with higher levels of education provide children with higher quality teaching and have higher levels of self-esteem (Cash et al., 2015; Early et al., 2006; Goble et al., 2015; IOM & NRC, 2015; Yamauchi et al., 2013), both factors that then lead to improved child outcomes. Son et al. (2013), for example, found that teachers with an early childhood education major engaged in higher quality social-emotional support practices and that children in higher-quality social-emotional classrooms had better math skills, social skills, and learning behaviors.

High teacher qualification is most often defined as a bachelor's degree in early childhood education, which has been recommended as a minimum requirement for lead educators working with children from birth through age 8 in ECE programs in recent reports (Bueno et al., 2010; IOM & NRC, 2015). Although some studies found that teacher qualifications alone fail to predict greater gains for children (Early et al., 2007; Vu et al., 2008; Yoshikawa et al., 2013), there is increasing evidence of a strong association between programs with higher quality ratings and the presence of lead teachers who have bachelor's degrees with specialized training in ECE (Ackerman, 2005; Austin et al., 2015; Early et al., 2006).

One of the recommendations from the early childhood care and education report by the Institute of Medicine and National Research Council (2015) is that states focus on formal education as a foundation for creating cohesive and aligned systems of professional development for ECE teachers to attain a bachelor's degree (IOM & NRC, 2015; Russell, 2012; Whitebook et al., 2009). Early educator preparation programs can build on features that research demonstrates are associated with high-quality educator preparation, including a focus on foundational knowledge in child development and applications of that knowledge to teaching, sustained and supported field experiences, and the provision of supports to promote educators' success in attaining a degree (Gardner et al., 2019). Content may draw from multiple sources, including institutional leadership and faculty, state learning goals, state teaching standards, and criteria in state laws and policies for licensure or certification (IOM & NRC, 2015). Well-supported and diverse faculty and staff with strong expertise and experience in ECE and who have latitude in determining content and pedagogy are crucial to ensuring a program that meets the educational needs of students from a variety of cultural and educational backgrounds (Ackerman, 2005; Gardner et al., 2019; Lobman et al., 2005).

In addition to formal education, professional development systems must build on flexible career lattice models that delineate multiple clear pathways for advancement and learning (Ackerman, 2004). Equitable professional development requires an affordable and accessible higher education system and the provision of support that educators need to obtain a formal degree (Linder et al., 2016; Rosenbaum, et al., 2006; Russell, 2012; Whitebook et al., 2018). Findings from a survey of staff and directors of Migrant Head Start programs in Michigan highlight the need for teacher preparation programs at community colleges and universities to take into consideration staff characteristics such as education levels, language skills, work history, and perceived barriers to education including low income, child care and family issues, academic challenge, and schedule conflicts (Rosenbaum et al., 2006). Career lattices allow entry for students from a wide array of educational backgrounds. Instructional approaches can be multifaceted and combine college coursework with hands-on learning and individualized supports to meet the diverse academic and financial needs of students (Gardner et al., 2019). Research also recommends that states encourage greater collaboration among two- and four-year colleges to align course content and create articulation agreements that can allow students to transfer credits among them (Schlinder, 2016).





To summarize, the three main types of supports seem crucial to a more equitable PD system: easy access such as offering distance learning opportunities and sufficient courses at times and locations that meet the needs of working students (Russell, 2012); financial supports in the form of scholarships and financial aid, paid time off, and availability of substitutes for current teachers; and educational supports such as academic counseling, technology, and language support especially for educators in low-income, minority, and immigrant communities (Bueno et al., 2016; Gardner et al., 2019).

Professional Development Infrastructure Indicators (state level)

PD 5. PD Data Collection and Data Use

State collects JEPL data on early learning professionals' race, income, and language; data are gathered and used in the following five ways:

- State collects data using tracking tools, program evaluation tools, early childhood educators surveys, and local level reports.
- State verifies the implementation of JEPL through monitoring, use of an online platform, or directly collecting early childhood educators surveys.
- State uses JEPL data for accountability and improvement.
- A quality assurance mechanism monitors the quality of JEPL provided to teachers and instructional leaders.
- State uses multiple sources of data to inform improvement plans and track progress and uses the data to guide technical assistance and resources to local programs.

Data is essential to gauge any impacts and systems change. Workforce and professional development data inform planning, evaluation, and quality assurance and accountability. They also inform the impact of broader system developments and track the effective investment of resources. Data may be gathered and maintained by multiple partners such as workforce/practitioner registries, academic researchers, and others (LeMoine, 2008; NAEYC, 2019). As of 2021, 41 states maintain a workforce registry database, a computerized record of a state's early childhood professionals' qualifications, credentials, and ongoing professional development (Demma, 2010; National Workforce Registry Alliance, n.d.; National Governors Association Center for Best Practices, 2010).

Although data-driven policymaking increasingly drives state early childhood quality improvement initiatives, data about the professional workforce's preparation and ongoing development are not regularly collected or analyzed at the state level. Differing federal and state program reporting requirements continue to dictate most of the information collected about early childhood, making it difficult to create a unified early childhood data system (Demma, 2010; Hyson & Whittaker, 2013; National Governors Association Center for Best Practices, 2010). Moreover, state-led efforts to gather professional development data struggle to bridge state agencies and higher education systems and comply with federal regulations, such as the Family Education Rights and Privacy Act (FERPA; Demma, 2010; Hyson & Whittaker, 2013; National Governors Association Center for Best Practices, 2010; National Research Council, 2012). This lack of data, unsurprisingly, leads to gaps in the research of the benefits of professional development. A high priority in the field right now is generating new research about the





impact of various kinds and dosages of professional development on practitioners' behavior and related child outcomes (Gupta & Daniels, 2012; Hyson & Whittaker, 2013).

Professional Development Infrastructure Indicators (state level)

PD6. PD Data Collection for Equity Goals

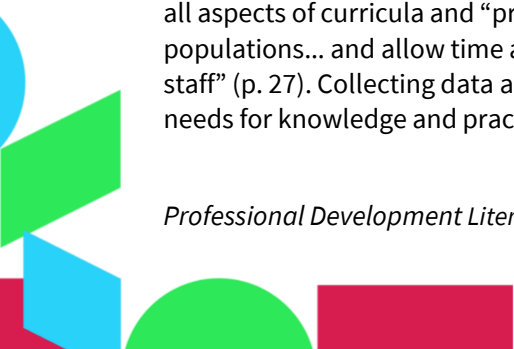
The state's efforts to understand and address inequity with regard to policies and practices around early learning core knowledge and PD standards, ongoing PD requirements and incentives, job-embedded PD standards and resources, and workforce development includes ongoing data collection, disaggregation of data, active discussions, data-driven decision-making, action planning, implementing, assessing implementation, and refining as needed.

The state specifically collects data to understand and address the following four components:

- The barriers to accessing affordable PD opportunities (Access includes location of available PD, language, 508 compliance, and diversity of trainers.)
- The need for PD opportunities that reflect teachers' or providers' diversity, and include voices and experiences of diverse teachers and providers
- The need for PD content that is comprehensive and meets the needs of all teachers (i.e., content is varied and supports teachers to engage with children from all backgrounds)
- Demographic differences in degree or credential attainment, and challenges to career advancement especially for populations of color, low-income, and dual language learners

In line with the framework of targeted universalism (Powell et al., 2019) used to guide the development of the IDM, equity indicators in each Element highlight the importance of ongoing data collection, the disaggregation of data, and the use of data for decision-making, action planning, and assessing implementation. This supports the five steps of targeted universalism (Powell et al., 2019), where once a universal goal is established (Step 1), and there is information about the performance of the general population relative to the universal goal (Step 2), the performance of different groups can be identified (Step 3), further analysis can be done to understand the structures that support or impede each group for achieving the universal goal (Step 4), and targeted strategies for each group can be developed and implemented to reach the universal goal (Step 5).

NAEYC provides recommendations for implementation of early childhood educator professional preparation programs that commit to advancing equity and diversity. NAEYC's (2019) position statement "Professional Standards and Competencies for Early Childhood Educators" recommends that PD standards and competencies be used to support the development of professional competency through professional preparation programs in addition to developing "articulation agreements and stackable, portable credentials that increase workforce diversity, equity, and access to new career opportunities" (p. 26). Additionally, NAEYC also recommends that professional preparation programs reflect principles of equity and diversity throughout all aspects of curricula and "provide field experiences that give candidates opportunities to work with diverse populations... and allow time and space to foster a learning community among administrators, faculty and staff" (p. 27). Collecting data around equity allows states to monitor and modify PD practices to meet educators' needs for knowledge and practices that support equitable outcomes for all children and families (Meeks et al.,





2020). For example, results from a survey of educators in Head Start centers in the Northeast U.S. indicated a need for specialized training to increase educators' knowledge and skills to implement effective inclusive practices for children with disabilities (Yu, 2019).

Massachusetts offers an example for how states can address equity and PD in their education system by providing free, equitable professional learning for all educators in the state. The Massachusetts State Equity Plan 2015–2019 focuses on PD for diverse student needs and details the “Massachusetts FOCUS Academy,” which is a PD system composed of free college courses providing educators with the skills, knowledge, and instructional strategies they need to improve outcomes for all students. Furthermore, Massachusetts has a Positive Behavior Interventions and Supports Academy program, which is a “multi-year professional development opportunity designed to train school and district teams in development and implementation of school and district-wide systems of behavioral supports and interventions” (Massachusetts State Equity Plan 2015–2019, p. 39). These are two valuable PD programs in Massachusetts which attempt to address issues around equity through implementing a systems approach to identifying individual student needs and using positive behavior supports.

Kornack and LiBetti (2021) outline five strategies to radically expand the talent pool in early education. The strategies outlined in the January 2021 paper “reflect the unique opportunity we have, born out of the pandemic, to capitalize on society’s newfound acknowledgement of the importance of early childhood education” (Kornack & LiBetti, 2021, p.1). The national conversation regarding race and equity empowers stakeholders in the early childhood field to rethink the ways in which PD can lead to equity and rethink “how a profession that is disproportionately women of color can be valued and compensated for the foundational work they do” (Kornack & LiBetti, 2021, p.1). The five strategies explored in the paper are to redefine credentials, rethink degree attainment, optimize practice-based training, expand job-embedded coaching, and connect in-service preparation to career advancement especially for educators of color. Redefining credentials entails creating a Child Development Professional credential, which is a new, nationally recognized lead teacher credential tailored to early educator competencies. Rethinking degree attainment relates to partnering with existing four-year regionally accredited higher education institutions in order to build an online degree program, providing early educators with the necessary content, training, and wraparound supports. Optimizing practice-based training includes strategically building on and expanding early childhood apprenticeships. Expanding job-embedded coaching means developing a credit-bearing coaching model. Lastly, connecting in-service preparation to career advancement entails designing career advancement opportunities that increase early educators’ effectiveness and that early educators can pursue while remaining in the classroom.

The Early Educator Preparation Landscape Report (2020) outlines some innovations to improve the quality of postsecondary training. One promising approach identified are courses offered by the EarlyEdU Alliance, a center operated by Cultivate Learning, within the University of Washington. The EarlyEdU Alliance is not a degree program, but it offers courses through a network of higher education institutions that partner with the EarlyEdU Alliance for course delivery. These courses are based on research on effective early childhood teaching practices and include competency-based and practice-focused coursework which is aligned to NAEYC competencies. All courses use video of effective classroom practice and integrate Ceci (formerly Coaching Companion), which is a web-based application that allows students to share videos of their own early childhood classroom practices and receive feedback from instructors. By using the developed course content and Ceci, the instructor’s role is shifted from creating and delivering course content to becoming a job-embedded coach who helps early childhood educators enroll in degree programs and integrate what they are learning into their own classrooms, ultimately improving their practice and bringing higher quality early childhood to more children.





Another innovation outlined in the Early Educator Preparation Landscape Report (2020) is the Early Learning Improvement Consortium (ELIC) in New Jersey. The ELIC comprises faculty from state four-year institutions of higher education and was formed with two goals in mind: “(1) to fund faculty to learn how to be research partners and collect data related to early childhood outcomes, and (2) to facilitate a common understanding of ECE learning goals and quality practices” (Early Educator Preparation Landscape, 2020, p. 38). The ELIC has assisted the New Jersey Department of Education to develop a common child assessment system which is used to measure children’s progress toward early learning language and literacy standards, and to help inform teaching practices.

IV. Future Directions and Limitations

The current body of research around professional development in early childhood education is extensive; however, there are some directions for future research. Zaslow et al. (2010) identified an important next step in the research on professional development, which is to distinguish among many different approaches to training to determine the specific features of training interventions that show the strongest evidence of positive outcomes. Professional development needs to be studied across three sets of outcomes: 1) educator knowledge, 2) educator practice, and 3) child outcomes (Zaslow et al., 2010). Child outcomes are particularly important, yet there is somewhat limited research on professional development training and child outcomes (Zaslow et al., 2010). There is a need for future studies of professional development to focus on “tracking changes in teacher attitudes or beliefs, changes in teacher behavior and performance, and changes in child learning and development” (Whitebook et al., 2009, p. 8). Researchers also recommend conducting studies with longitudinal designs in order to trace the effects of professional development on short- and long-term changes in educational practices and children’s learning and social-emotional well-being. When research captures these bottom-line outcomes related to professional development, policy makers and professionals will begin to have the evidence they need in order to make informed decisions about the best direction and focus of professional development resources (Whitebook et al., 2009).

Policy recommendations that can attenuate some of the current gaps in the field include creating state policies that “foster cross-agency and cross-program data collection, sharing, and alignment. Policies also should require comprehensive workforce studies at regular intervals and ongoing collection of professional development utilization and improvement indicators. States should ensure workforce data sharing takes place between state agencies, as well as between higher education institutions” (Demma, 2010, p. 8). Moreover, “state policies should require the methods and collection of specific data and also mandate non duplication of efforts, cross-sector data collection, sharing, and alignment. It is also recommended that policies require comprehensive workforce studies at regular intervals and ongoing collection of professional development utilization and improvement indicators. Additionally, research recommends that policies include specific requirements for disaggregated data by type of setting, demographics, and primary financing source(s)” (LeMoine, 2008, p. 24).

Another recommendation from Whitebook et al. (2009) is that “a first-ever national ECE workforce data system to provide information compatible with state- and national-level data collected about K-12 teachers” (p. 9) be developed. Public and private partners can work together to create consensus for an integrated infrastructure for an ECE workforce database that coordinates federally supported ECE research efforts across departments and agencies. According to Sheridan et al. (2009), “a research agenda in early childhood professional development is needed (a) to unpack basic information on processes that promote the development of the





skills and competencies necessary to provide high-quality, evidence-based early childhood experiences; and (b) to identify interactions that occur between form and process and that influence the outcomes of professional development efforts. Research is needed that evaluates relative contributions of professional and personal characteristics of staff, content of training, coaching/consulting practices, roles and relationships, systemic and contextual variables, and the interaction effects among them..." (Sheridan et al., 2009, p. 396). These recommendations for future directions of research are a few valuable policy recommendations that have the potential to fill in gaps in the current body of research around professional development and child outcomes.





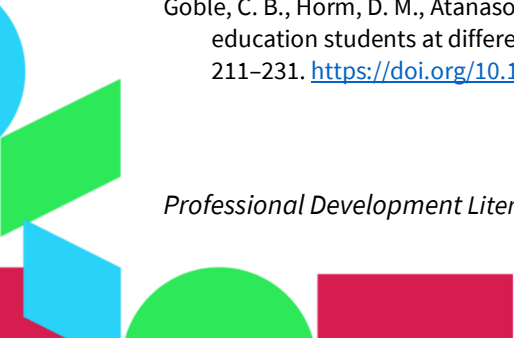
References

- Ackerman, D. J. (2004). States' efforts in improving the qualifications of early care and education teachers. *Educational Policy*, 18(2), 311–337.
- Ackerman, D. J. (2005). Getting teachers from here to there: Examining issues related to an early care and education teacher policy. *Early Childhood Research & Practice*, 7(1), 1–17.
- Ackerman, D., & Barnett, W. (2006). *Increasing the effectiveness of preschool programs*. National Institute for Early Education Research.
- Ansari, A., & Pianta, R. C. (2018). Effects of an early childhood educator coaching intervention on preschoolers: The role of classroom age composition. *Early Childhood Research Quarterly*, 44, 101–113.
<https://doi.org/10.1016/j.ecresq.2018.03.001>
- Artman-Meeker, K., Hemmeter, M. L., & Snyder, P. (2014). Effects of distance coaching on teachers' use of pyramid model practices: A pilot study. *Infants & Young Children*, 27(4), 325–344. <https://doi.org/10.1097/IYC.000000000000016>
- Austin, L. J. E., Whitebook, M., Connors, M. & Darrah, R. (2011). *Staff preparation, reward, and support: Are quality rating and improvement systems addressing all of the key ingredients necessary for change?* Center for the Study of Child Care Employment, University of California at Berkeley.
- Austin, L. J. E., Whitebook, M., Kipnis, F., Sakai, L., Abbasi, F., & Amanta, F. (2015). *Teaching the teachers of our youngest children: The state of early childhood higher education in California, 2015*. Center for the Study of Child Care Employment, University of California, Berkeley.
- Barton, E. E., Fuller, E. A., & Schnitz, A. (2016). The use of email to coach preservice early childhood teachers. *Topics in Early Childhood Special Education*, 36(2), 78–90. <https://doi.org/10.1177/0271121415612728>
- Bellm, D., & Whitebook, M. (2004). State registries of the early care and education workforce: A review of current models and options for California. Center for the Study of Child Care Employment, University of California at Berkeley.
- Beneke, M. R., Newton, J. R., Vinh, M., Boone Blanchard, S., & Kemp, P. (2019). Practicing inclusion, doing justice: disability, identity, and belonging in early childhood. *Zero to Three*, 39(3), 26–34.
- Bloom, P. J., Jackson, S., Talan, T. N., & Kelton, R. (2013). *Taking charge of change: A 20-year review of empowering early childhood administrators through leadership training*. McCormick Center for Early Childhood Leadership, National Louis University.
- Boscardin, M. L., Weir, K., & Kusek, C. (2010). A national study of state credentialing requirements for administrators of special education. *Journal of Special Education Leadership*, 23(2), 61–75.
- Buchanan, M. L., Morgan, M., Cooney, M., & Gerharter, M. (2006). The University of Wyoming Early Childhood Summer Institute: A model for professional development that leads to changes in practice. *Journal of Early Childhood Teacher Education*, 27(2), 161–169.
- Bueno, M., Darling-Hammond, L., Gonzales, D. M. (2010). *A matter of degrees: Preparing teachers for the pre-k classroom*. PEW Center on the States.
- Burchinal, M. R., Roberts, J. E., Riggins Jr, R., Zeisel, S. A., Neebe, E., & Bryant, D. (2000). Relating quality of center-based child care to early cognitive and language development longitudinally. *Child Development*, 71(2), 339–357.
- Cabusao, J., Fleischer, C., & Polson, B. (2019). Shifting from professional development to professional learning: Centering teacher empowerment. National Council of Teachers of English. Retrieved from:
<https://ncte.org/statement/proflearning/>





- Cash, A. H., Cabell, S. Q., Hamre, B. K., DeCoster, J., & Pianta, R. C. (2015). Relating prekindergarten teacher beliefs and knowledge to children's language and literacy development. *Teaching and Teacher Education*, 48, 97–105. <https://doi.org/10.1016/j.tate.2015.02.003>
- Castro, D. C., Gillanders, C., Franco, X., Bryant, D. M., Zepeda, M., Willoughby, M. T., & Méndez, L. I. (2017). Early education of dual language learners: An efficacy study of the Nuestros Niños School readiness professional development program. *Early Childhood Research Quarterly*, 40, 188–203. <https://doi.org/10.1016/j.ecresq.2017.03.002>
- Crawford, A., Zucker, T., Van Horne, B., & Landry, S. (2017). Integrating Professional development content and formative assessment with the coaching process: The Texas school ready model. *Theory Into Practice*, 56(1), 56–65.
- Crawford, A. D., Zucker, T. A., Williams, J. M., Bhavsar, V., & Landry, S. H. (2013). Initial validation of the prekindergarten classroom observation tool and goal setting system for data-based coaching. *School Psychology Quarterly*, 28(4), 277–300. <https://doi.org/10.1037/spq0000033>
- Cryer, D., Tietze, W., Burchinal, M., Leal, T., & Palacios, J. (1999). Predicting process quality from structural quality in preschool programs: A cross-country comparison. *Early Childhood Research Quarterly*, 14(3), 339–361.
- CSCCE, et al. (2020). *Early educator preparation landscape*. Early Educator Investment Collaborative.
- Demma, R. (2010). *Building an early childhood professional development system*. National Governors Association Center for Best Practices.
- Dennis, L., & Horn, E. (2014). The effects of professional development on preschool teachers' instructional behaviours during storybook reading. *Early Child Development and Care*, 184(8), 1160–1177. <https://doi.org/10.1080/03004430.2013.853055>
- Early, D. M., Bryant, D. M., Pianta, R. C., Clifford, R. M., Burchinal, M. R., Ritchie, S., Howes, C., Barbarin, O.A. (2006). Are teachers' education, major, and credentials related to classroom quality and children's academic gains in pre-Kindergarten? *Early Childhood Research Quarterly*, 21, 174–195.
- Early, D., Burchinal, M., Barbarin, O., Bryant, D., Chang, F., Clifford, R., Crawford, G., Weaver, W., Howes, C., Ritchie, S., Kraft-Sayre, M., Pianta, R., Steven Barnett, W. (2013). *Pre-kindergarten in eleven states: NCEDL's multi-state study of re-kindergarten and study of state-wide early education programs (SWEEP)* (Publication no. 10.3886/ICPSR34877.v1). (ICPSR34877-v1). Retrieved March 13, 2014, from Inter-University Consortium for Political and Social Research.
- Early, D. M., Maxwell, K. L., Burchinal, M., Alva, S., Bender, R. H., Bryant, D., & Zill, N. (2007). Teachers' education, classroom quality, and young children's academic skills: Results from seven studies of preschool programs. *Child Development*, 78(2), 558–580.
- Eckhardt, A. G. & Egert, F. (2020). Predictors for the quality of family child care. *Children and Youth Services Review*, 116. doi.org/10.1016/j.childyouth.2020.105205
- Ehrenberg, P. M., Robinson, A., & Snow, K. (2012). Early grades, early childhood. *American School Board Journal*, 199(11), 14–16.
- Espinosa, L. (2002). High-quality preschool: Why we need it and what it looks like [Policy brief]. November, 2002.
- Faria, A.-M., Hawkinson, L., Metzger, I., Bouacha, N., Cantave, M. (2017). The “I” in QRIS survey: Collecting data on quality improvement activities for early childhood education programs. REL 2017-221. In Regional Educational Laboratory Midwest https://ies.ed.gov/ncee/edlabs/regions/midwest/pdf/REL_2017221.pdf
- Gardner, M., Melnick, H., Meloy, B., & Barajas, J. (2019). *Promising models for preparing a diverse, high-quality early childhood workforce*. [Research brief]. Learning Policy Institute.
- Goble, C. B., Horm, D. M., Atanasov, A. M., Williamson, A. C., & Choi, J. Y. (2015). Knowledge and beliefs of early childhood education students at different levels of professional preparation. *Journal of Early Childhood Teacher Education*, 36(3), 211–231. <https://doi.org/10.1080/10901027.2015.1062831>





- Gomez, R. E., Kagan, S. L., & Fox, E. A. (2015). Professional development of the early childhood education teaching workforce in the United States: An overview. *Professional Development in Education*, 41(2), 169–186.
- Gropen, J., Kook, J. F., Hoisington, C., & Clark-Chiarelli, N. (2017). Foundations of science literacy: Efficacy of a preschool professional development program in science on classroom instruction, teachers' pedagogical content knowledge, and children's observations and predictions. *Early Education and Development*, 28(5), 607–631. <https://doi.org/10.1080/10409289.2017.1279527>
- Gupta, S., & Daniels, J. (2012). Coaching and professional development in early childhood classrooms: Current practices and recommendations for the future. *NHSA Dialog*, 15(2), 206–220.
- Hallam, R. A., Bargreen, K. N., & Ridgley, R. (2013). Quality in family child care settings: The relationship between provider educational experiences and global quality scores in a statewide quality rating and improvement system. *Journal of Research in Childhood Education*, 27(4), 393–406. <https://doi.org/10.1080/02568543.2013.822950>
- Hamre, B. K., Pianta, R. C., Mashburn, A. J., & Downer, J. T. (2012). Promoting young children's social competence through the preschool PATHS curriculum and MyTeachingPartner professional development resources. *Early Education and Development*, 23(6), 809–832. <https://doi.org/10.1080/10409289.2011.607360>
- Harding, J. F., Connors, M. C., Krauss, A. F., Aikens, N., Malone, L., & Tarullo, L. (2019). Head Start teachers' professional development, well-being, attitudes, and practices: Understanding changes over time and predictive associations. *American Journal of Community Psychology*, 63(3–4), 324–337. <https://doi.org/10.1002/ajcp.12327>
- Haslip, M. J., & Gullo, D. F. (2018). The changing landscape of early childhood education: Implications for policy and practice. *Early Childhood Education Journal*, 46(3), 249–264. <https://doi.org/10.1007/s10643-017-0865-7>
- Hemmeter, M. L., Snyder, P. A., Fox, L., & Algina, J. (2016). Evaluating the implementation of the pyramid model for promoting social-emotional competence in early childhood classrooms. *Topics in Early Childhood Special Education*, 36(3), 133–146. doi:[10.1177/0271121416653386](https://doi.org/10.1177/0271121416653386)
- Hyson, M. and Whittaker, J. V. (2012). Professional Development in Early Childhood Systems. In Kagan, S., & Kauerz, K. (Eds.), *Early childhood systems: Transforming early learning* (pp. 104–118). Teachers College Press.
- Institute of Medicine & National Research Council. (2015). *Transforming the workforce for children birth through age 8: A unifying foundation*. The National Academies Press. <https://doi.org/10.17226/19401>.
- Institute of Medicine & National Research Council. (2012). *The early childhood care and education workforce: Challenges and opportunities: A workshop report*. National Academies Press.
- Isner, T., Tout, K., Zaslow, M., Soli, M., Quinn, K., Rothenberg, L., Burkhauser, M. (2011). *Coaching in early care and education programs and quality rating and improvement systems (QRIS): Identifying promising features*. Child Trends.
- Kagan, S. L., Kauerz, K., & Tarrant, K. (2007). *The early care and education teaching workforce at the fulcrum: An agenda for reform*. Teachers College Press.
- Kelley, P., & Camilli, G. (2007). *The impact of teacher education on outcomes in center-based early childhood education programs: A meta-analysis*. National Institute for Early Education Research, Rutgers University.
- Kilday, C. R., Kinzie, M. B., Mashburn, A. J., & Whittaker, J. V. (2012). Accuracy of teacher judgments of preschoolers' math skills. *Journal of Psychoeducational Assessment*, 30(2), 148–159. <https://doi.org/10.1177/0734282911412722>
- Kim, S., Chang, M., & Kim, H. (2011). Does teacher educational training help the early math skills of English language learners in Head Start? *Children and Youth Services Review*, 33(5), 732–740.
- Kinzie, M. B., Whittaker, J. V., Williford, A. P., DeCoster, J., McGuire, P., Lee, Y., & Kilday, C. R. (2014). MyTeaching Partner-math/science pre-kindergarten curricula and teacher supports: Associations with children's mathematics and science learning. *Early Childhood Research Quarterly*, 29(4), 586–599. <https://doi.org/10.1016/j.ecresq.2014.06.007>





- Kornack, C., & LiBetti, A. (2021). Broader, deeper, fairer: Five strategies to radically expand the talent pool in early education. NHA, Headstarter Network and Bellweather Education Partners.
- Landry, S. H., Anthony, J. L., Swank, P. R., & Monseque-Bailey, P. (2009). Effectiveness of comprehensive professional development for teachers of at-risk preschoolers. *Journal of Educational Psychology*, 101(2), 448–465. <https://doi.org/10.1037/a0013842>
- Lee, Y.-J., & Recchia, S. L. (2016). Zooming in and out: Exploring teacher competencies in inclusive early childhood classrooms. *Journal of Research in Childhood Education*, 30(1), 1–14. <https://doi.org/10.1080/02568543.2015.1105330>
- LeMoine, S. (2008) *Workforce designs: A policy blueprint for state early childhood professional development systems*. National Association for the Education of Young Children.
- Lin, Y.-C., & Magnuson, K. A. (2018). Classroom quality and children’s academic skills in child care centers: Understanding the role of teacher qualifications. *Early Childhood Research Quarterly*, 42, 215–227. <https://doi.org/10.1016/j.ecresq.2017.10.003>
- Linder, S. M., Rembert, K., Simpson, A., & Ramey, M. D. (2016). A mixed-methods investigation of early childhood professional development for providers and recipients in the United States. *Professional Development in Education*, 42(1), 123–149.
- Lipscomb, S. T., Schmitt, S. A., & Pratt, M. E. (2015). Professional development scholarships increase qualifications of diverse providers. *Journal of Early Childhood Teacher Education*, 36(3), 232–249. <https://doi.org/10.1080/10901027.2015.1062829>
- Lobman, C., Ryan, S., & McLaughlin, J. (2005). Reconstructing teacher education to prepare qualified preschool teachers: Lessons from New Jersey. *Early Childhood Research & Practice*, 7(2).
- Lorio, C. M., & Woods, J. J. (2020). Multi-component professional development for educators in an Early Head Start: Explicit vocabulary instruction during interactive shared book reading. *Early Childhood Research Quarterly*, 50(Part 1), 86–100. <https://doi.org/10.1016/j.ecresq.2018.12.003>
- Manning, M., Garvis, S., Fleming, C., & Wong T. W. G. (2017). *The relationship between teacher qualification and the quality of the early childhood care and learning environment*. Campbell Systematic Reviews 2017:1, DOI: 10.4073/csr.2017.1
- Massachusetts Department of Elementary and Secondary Education. (2015). *Massachusetts State Equity Plan 2015-2019*. <https://www.doe.mass.edu/edeffectiveness/equitableaccess/plan/plan.pdf>
- Marshall, N. L., Dennehy, J. , Starr, E. , & Robeson, W. W. (2005). *Preparing the early education and care workforce: The capacity of Massachusetts’ institutions of higher education*. Wellesley Centers for Women.
- McLeod, R. H., Kim, S., & Resua, K. A. (2019). The effects of coaching with video and email feedback on preservice teachers’ use of recommended practices. *Topics in Early Childhood Special Education*, 38(4), 192–203. <https://doi.org/10.1177/0271121418763531>
- Meek, S., Iruka, I. U., Allen, R., Yazzie, D., Fernandez, V., Catherine, E., McIntosh, K., Gordon, L., Gilliam, W., Hemmeter, M. L., Blevins, D., & Powell, T. (2020). Fourteen priorities to dismantle systemic racism in early care and education. The Children’s Equity Project. Retrieved from: <https://childandfamilysuccess.asu.edu/cep>
- National Child Care Information Center. (2006). *Elements of a professional development system for early care and education: A simplified framework*. National Child Care Information Center.
- National Institute of Child Health and Human Development [NICHD] (2002). Child-care structure -> process -> outcome: Direct and indirect effects of child-care quality on young children’s development. *Psychological Science*, 13, 199–206. <https://doi.org/10.1111%2F1467-9280.00438>
- National Professional Development Center on Inclusion. (2008). *What do we mean by professional development in the early childhood field?* The University of North Carolina, FPG Child Development Institute. <http://npdci.fpg.unc.edu>





- National Workforce Registry Alliance. (n.d.). Retrieved from <https://www.registryalliance.org/member-profiles/>
- Neuman, S., & Cunningham, L. (2009). The impact of professional development and coaching on early language and literacy instructional practices. *American Educational Research Journal*, 46, 532–566. <https://doi.org/10.3102/0002831208328088>.
- O'Brien, J., & Jones, K. (2014). Professional learning or professional development? Or continuing professional learning and development? Changing terminology, policy and practice. *Professional Development in Education*, 40(5), 683–687. <https://doi.org/10.1080/19415257.2014.960688>
- Ochshorn, S. (2011). *Forging a new framework for professional development: A report on "The Science of Professional Development in Early Childhood Education: A National Summit."* ZERO TO THREE
- Paris, D., & Alim, H. S. (2014). What are we seeking to sustain through culturally sustaining pedagogy? A loving critique forward. *Harvard Educational Review*, 84(1), 85–100. <https://doi.org/10.17763/haer.84.1.982l873k2ht16m77>
- ParTEE, A. M., Hamre, B. K., & Williford, A. P. (2019). Examining the role of preschool classrooms' behavioral composition as a predictor of the quality of teacher–child interactions. *Early Education and Development*. <https://doi.org/10.1080/10409289.2019.1694813>
- Phillips, D., Austin, L. J. E., & Whitebook, M. (2016). The early care and education workforce. *The Future of Children*, 26(2), 139–158. <https://doi.org/10.1353/foc.2016.0016>
- Pianta, R. C., Barnett, W. S., Burchinal, M., & Thornburg, K. R. (2009). The effects of preschool education: What we know, how public policy is or is not aligned with the evidence base, and what we need to know. *Psychological Science in the Public Interest*, 10(2), 49–88. <https://doi.org/10.1177/1529100610381908>
- Pianta, R., Downer, J., & Hamre, B. (2016). Quality in early education classrooms: Definitions, gaps, and systems. *The Future of Children*, 26(2), 119–137. <https://doi.org/10.1353/foc.2016.0015>
- Pianta, R., Howes, C., Burchinal, M., Bryant, D., Clifford, R., Early, D., & Barbarin, O. (2005) Features of pre-kindergarten programs, classrooms, and teachers: Do they predict observed classroom quality and child-teacher interactions? *Applied Developmental Science*, 9:3,144–159. https://doi.org/10.1207/s1532480xads0903_2
- Piasta, S. B., Farley, K. S., Mauck, S. A., Soto Ramirez, P., Schachter, R.E., O'Connell, A. A., Justice, L. M., Spear, C. F., & Weber-Mayrer, M. (2020). At-scale, state-sponsored language and literacy professional development: Impacts on early childhood classroom practices and children's outcomes. *Journal of Educational Psychology*, 112(2), 329–343. <https://doi.org/10.1037/edu0000380>
- Piasta, S. B., Logan, J. A. R., Pelatti, C. Y., Capps, J. L., & Petrill, S. A. (2015). Professional development for early childhood educators: Efforts to improve math and science learning opportunities in early childhood classrooms. *Journal of Educational Psychology*, 107(2), 407–422. <https://doi.org/10.1037/a0037621>
- Ponder, K. (n.d.). *Unifying framework for the early childhood education profession*.
- Powell, J., Menendian, S., & Ake, W. (2019). Targeted universalism: Policy & practice. Haas Institute for a Fair and Inclusive Society. Retrieved November 9, 2020, from <https://belonging.berkeley.edu/targeteduniversalism>
- Professional Standards and Competencies for Early Childhood Educators. (2019). NAEYC. <https://www.naeyc.org/resources/position-statements/professional-standards-competencies>
- Recommendations for those facilitating educator preparation and professional development. (n.d.). NAEYC. <https://www.naeyc.org/resources/position-statements/equity/recommendations-facilitating-development>
- Reeves, D. B., & Flach, T. (2011). Data: Meaningful analysis can rescue schools from drowning in Ddata. *Journal of Staff Development*, 32(4), 34–38.





- Rispoli, M., Ninci, J., Burke, M. D., Zaini, S., Hatton, H., & Sanchez, L. (2015). Evaluating the accuracy of results for teacher implemented trial-based functional analyses. *Behavior Modification*, 39(5), 627–653. <https://doi.org/10.1177/0145445515590456>
- Rosenbaum, R. P., Smith, J., & Zhang, G. (2006). Labor market and teaching staff considerations for making early childhood education work for migrant Head Start teachers: The case of Michigan Migrant Head Start. *Journal of Early Childhood Teacher Education*, 27(1), 87–102.
- Russell, S. (2012). Building a high-performing early childhood professional development System: North Carolina. In Kagan, S., & Kauerz, K. (2012). *Early childhood systems: Transforming early learning* (pp. 104–118). Teachers College.
- Ryan, S., Whitebook, M., Kipnis, F., & Sakai, L. (2011). Professional development needs of directors leading in a mixed service delivery preschool system. *Early Childhood Research and Practice*, 13(1).
- Sakai, L. Kipnis, F., & Whitebook, M. (2014). Yes they can: Supporting bachelor degree attainment for early childhood practitioners. *Early Childhood Research and Practice*, 16(1&2). Retrieved from <https://eric.ed.gov/?id=EJ1045212>
- Schilder, D. (2016, April). *Early childhood teacher education policies: Research review and state trends* [Policy Report]. Center on Enhancing Early Learning Outcomes.
- Setodji, C. M., Le, V.-N., & Schaack, D. (2012). Accounting for movement between childcare classrooms: Does it change teacher effects interpretations? *Journal of Applied Developmental Psychology*, 33(1), 1–12. <https://doi.org/10.1016/j.appdev.2011.11.001>
- Shamblin, S., Graham, D., & Bianco, J. A. (2016). Creating trauma-informed schools for rural Appalachia: The partnerships program for enhancing resiliency, confidence and workforce development in early childhood education. *School Mental Health*, 8(1), 189–200. <https://doi.org/10.1007/s12310-016-9181-4>
- Sheridan, S., Edwards, C., Marvin, C., & Knoche, L. (2009). Professional development in early childhood programs: Process issues and research needs. *Early Education & Development*, 20(3), 377–401.
- Slider, N. J., Noell, G. H., & Williams, K. L. (2006). Providing practicing teachers classroom management professional development in a brief self-study format. *Journal of Behavioral Education*, 15(4), 215–228.
- Snyder, P. A., Hemmeter, M. L., & Fox, L. (2015). Supporting implementation of evidence-based practices through practice-based coaching. *Topics in Early Childhood Special Education*, 35(3), 133–143.
- Solari, E. J., Zucker, T. A., Landry, S. H., & Williams, J. M. (2016). Relative effects of a comprehensive versus reduced training for Head Start teachers who serve Spanish-speaking English learners. *Early Education and Development*, 27(7), 1060–1076. <https://doi.org/10.1080/10409289.2016.1158610>
- Son, S.-H., Kwon, K.-A., Jeon, H.-J., & Hong, S.-Y. (2013). Head Start classrooms and children's school readiness benefit from teachers' qualifications and ongoing training. *Child & Youth Care Forum*, 42(6), 525–553. <https://doi.org/10.1007/s10566-013-9213-2>
- Stoiber, K. C., & Gettinger, M. (2011). Functional assessment and positive support strategies for promoting resilience: Effects on teachers and high-risk children. *Psychology in the Schools*, 48(7), 686–706. <https://doi.org/10.1002/pits.20587>
- Szekely, A. (2013). *Leading for early success: building school principals' capacity to lead high-quality early education*. National Governors Association.
- Talan, T. N., Bloom, P. J., & Kelton, R. E. (2014). Building the leadership capacity of early childhood directors: An evaluation of a leadership development model. *Early Childhood Research & Practice*, 16(1).
- Literacy Information and Communication System (LINCS). (2011). Teaching Excellence in Adult Literacy (TEAL) Center Fact Sheet No. 11: Adult Learning Theories. Retrieved from <https://lincs.ed.gov/state-resources/federal-initiatives/teal/guide/adultlearning>



- Tonyan, H. A., Nuttall, J., Torres, J., & Bridgewater, J. (2017). Engaging with quality improvement initiatives: A descriptive study of learning in the complex and dynamic context of everyday life for family child care providers. *Early Education and Development*, 28(6), 684–704. <https://doi.org/10.1080/10409289.2017.1305152>
- Trawick-Smith, J., Oski, H., DePaolis, K., Krause, K., & Zebrowski, A. (2016). Naptime data meetings to increase the math talk of early care and education providers. *Journal of Early Childhood Teacher Education*, 37(2), 157–174. <https://doi.org/10.1080/10901027.2016.1165762>
- Vu, J. A., Jeon, H.-J., & Howes, C. (2008). Formal education, credential, or both: Early childhood program classroom practices. *Early Education and Development*, 19(3), 479–504.
- Wasik, B. A., & Hindman, A. H. (2020). Increasing preschoolers' vocabulary development through a streamlined teacher professional development intervention. *Early Childhood Research Quarterly*, 50 (Part 1), 101–113. <https://doi.org/10.1016/j.ecresq.2018.11.001>
- Wasik, B. A., & Hindman, A. H. (2011). Improving vocabulary and pre-literacy skills of at-risk preschoolers through teacher professional development. *Journal of Educational Psychology*, 103(2), 455–469. <https://doi.org/10.1037/a0023067>
- Weber-Mayrer, M. M., Piasta, S. B., & Yeager Pelatti, C. (2015). State-sponsored professional development for early childhood educators: Who participates and associated implications for future offerings. *Journal of Early Childhood Teacher Education*, 36(1), 44–60.
- Whitebook, M. (2014). *Building a skilled teacher workforce: Shared and divergent challenges in early care and education and in grades K-12*. University of California, Berkeley, Institute for Research on Labor and Employment.
- Whitebook, M., Gomby, D., Bellm, D., Sakai, L., & Kipnis, F. (2009). *Preparing teachers of young children: The current state of knowledge, and a blueprint for the future*. [Executive Summary]. University of California at Berkeley.
- Whitebook, M., McLean, C., and Austin, L. J. E. (2016). *Early childhood workforce index – 2016*. Center for the Study of Child Care Employment, University of California, Berkeley. <https://cscce.berkeley.edu/files/2016/Early-Childhood-Workforce-Index-2016.pdf>
- Whitebook, M., McLean, C., Austin, L. J. E., & Edwards, B. (2018). *Early childhood workforce index – 2018*. Center for the Study of Child Care Employment, University of California, Berkeley. Retrieved from <http://cscce.berkeley.edu/topic/early-childhood-work-force-index/2018/>
- Winton, P. J., Ed, McCollum, Jeanette A., Ed., & Catlett, Camille, Ed. (2007). *Practical approaches to early childhood professional development: Evidence, strategies, and resources [with CD-ROM]*. ZERO TO THREE. National Center for Infants, Toddlers and Families.
- Yamauchi, L. A., Im, S., Lin, C.-J., & Schonleber, N.S. (2013). The influence of professional development on changes in educators' facilitation of complex thinking in preschool classrooms. *Early Child Development and Care*, 183(5), 689–706. <https://doi.org/10.1080/03004430.2012.685934>
- Yoshikawa, H., Weiland, C., Brooks-Gunn, J., Burchinal, M., Espinosa, L., Gormley, W., Ludwig, J., Magnuson, K., Phillips, D., Zaslow, M. J. (2013). *Investing in our future: The evidence base on preschool education [Policy Brief]*. Retrieved from the Foundation for Child Development website: <http://fcd-us.org/sites/default/files/Evidence%20Base%20on%20Preschool%20Education%20FINAL.pdf>
- Yu, S. (2019). Head Start teachers' attitudes and perceived competence toward inclusion. *Journal of Early Intervention*, 41(1), 30–43.
- Zaslow, M., Tout, K., Halle, Tamara, Whittaker, J. V., & Lavelle, B. (2010). *Toward the identification of features of effective professional development for early childhood educators*. [Literature Review]. Office of Planning, Evaluation and Policy Development.





Appendix A

Table 1. Professional Development Literature Review Summary

Key word or phrase	# Articles for initial abstract review based on inclusion criteria	# Articles for 2nd abstract review with exclusion criteria	# Articles passed full article review	Article citation
Coaching	30	4	4	Harding et al., 2019 (PD2); Lorio & Woods, 2020 (PD2); Piasta et al., 2020 (PD2); Wasik & Hindman, 2020 (PD2)
Job-embedded professional development	9	4	3	Crawford et al., 2017 (PD3); Slider et al., 2006 (PD1); Snyder et al., 2015 (PD3)
Ongoing professional development	3	3	1	Wasik & Hindman, 2011 (PD2)
Professional development requirements	42	3	3	Boscardin et al., 2010 (PD5); Haslip & Gullo, 2018 (PD1); Linder et al., 2016 (PD9, 12)
Professional development standards	23	2	1	Reeves & Flach, 2011 (PD7)
Professional development	40	12	11	Ansari & Pianta, 2018 (PD1, 3); Castro et al., 2017 (PD10); Crawford et al., 2013 (PD3); Dennis & Horn, 2014 (PD1); Gropen et al., 2017 (PD1); Kinzie et al., 2014 (PD1); Rispoli et al., 2015 (PD1); Solari et al., 2016 (PD3); Trawick-Smith et al., 2016 (PD3); Yamauchi et al., 2013 (PD1); Phillips et al., 2016 (PD2)



Key word or phrase	# Articles for initial abstract review based on inclusion criteria	# Articles for 2nd abstract review with exclusion criteria	# Articles passed full article review	Article citation
Quality rating and improvement systems	6	2	7	Faria et al., 2017 (PD1); Goble et al., 2015 (PD1); Hallam et al., 2013 (PD2); Lipscomb et al., 2015 (PD1); Partee et al., 2019 (PD1); Pianta et al., 2016 (PD1); Tonyan et al., 2017 (PD3)
Teacher competencies	2	2	2	Lee & Recchia, 2016 (PD1); Stoiber & Gettinger, 2011 (PD1)
Teacher core knowledge	45	5	3	Cash et al., 2015 (PD1); Kilday et al., 2012 (PD2); Piasta et al., 2015 (PD1)
Teacher qualifications	15	5	5	Kim et al., 2011 (PD1, 2); Lin & Magnuson, 2018 (PD1); Pianta et al., 2009 (PD1); Setodji et al., 2012 (PD1); Son et al., 2013 (PD1, 2)
Workforce development	38	2	1	Shamblin et al., 2016 (PD1)
Career lattice	4	2	1	Ackerman, 2004 (PD7)
Linguistically diverse workforce	6	2	1	Gardner et al., 2019 (PD9)
Professional development accessibility	8	1	1	Hamre et al., 2012 (PD2)





Key word or phrase	# Articles for initial abstract review based on inclusion criteria	# Articles for 2nd abstract review with exclusion criteria	# Articles passed full article review	Article citation
Professional development affordable	4	1	1	Buchanan et al., 2006 (PD9)
Teacher recruitment	51	9	2	Rosenbaum et al., 2006 (PD1, 7); Weber-Mayrer et al., 2015 (PD1)
Expert recommendations	NA	NA	51	Yu, 2019 (PD6); Espinosa, 2002 (PD6); Paris & Alim, 2014 (PD6); Beneke et al., 2019 (PD6); Powell et al., 2019 (PD6); Landry et al., 2009 (PD1, 3, & 7); Massachusetts Department of Elementary and Secondary Education, 2015 (PD6); NAEYC, 2019 (PD6); NAEYC, n.d. (PD6); Schilder, 2016 (PD4, 12); Ackerman, 2005 (PD4); Eckhardt & Egert, 2020 (PD2); Lobman et al., 2005 (PD4, 11); Manning et al., 2017 (PD2); Vu et al., 2008 (PD11); Kelley & Camilli, 2007 (PD4, 11); Early et al., 2007 (PD5); Early et al., 2006 (PD5); Bueno et al., 2010 (PD4); Whitebook, 2014 (PD4); Talan et al., 2014 (PD7); Szekely, 2013 (PD8); Ryan et al., 2011 (PD8); Demma, 2010 (PD1, 5, 9, & 12); Hyson & Whittaker, 2013 (PD1, 3, 5, & 12); Kagan et al., 2007 (PD1, 3, & 12); Marshall et al., 2005 (PD1, 3, 5, & 12); National Research Council, 2012 (PD1, 5, & 7); Russell, 2012 (PD11); National Child Care Information Center, 2006 (PD1, 3); Ochshorn, 2011 (PD1); Whitebook et al., 2009 (PD1, 3, & 7); Zaslow et al., 2010 (PD3, 7); LeMoine, 2008 (PD1, 2, 3, & 5); Winton et al., 2007 (PD11); Austin et al., 2011 (PD2); Gupta & Daniels, 2012 (PD3,



Key word or phrase	# Articles for initial abstract review based on inclusion criteria	# Articles for 2nd abstract review with exclusion criteria	# Articles passed full article review	Article citation
				7); Sheridan et al., 2009 (PD3, 7); Isner et al., 2011 (PD3); Ackerman & Barnett, 2006 (PD4); Bellm et al., 2004 (PD5); Gomez et al., 2015 (PD7); Bloom et al., 2013 (PD8); CSCCE, 2020 (PD6); Kornack & LiBetti, 2021 (PD6); Artman-Meeker et al., 2014 (PD3); Barton, 2016 (PD3); Crawford et al., 2016 (PD3); Hemmeter et al., 2016 (PD3); McLeod et al., 2019 (PD3); Neuman & Cunningham, 2009 (PD3)
Total	326	59	98	



Professional Development Literature Review Summary (excluded articles)

Key word or phrase	# Articles for initial abstract review based on inclusion criteria	# Articles for 2nd abstract review with exclusion criteria	# Articles passed full article review
Culturally diverse workforce	39	0	0
Leadership development	14	1	0
Teacher compensation	92	10	0
Teacher retention	81	8	0
Teacher technical assistance	1	1	0
Total	227	20	0

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