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Preparing Teachers of Young Children: The Current State of Knowledge, and a Blueprint for the Future

Executive Summary

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This report summarizes two companion papers, both available from the Center for the Study of Child Care Employment, http://www.irle.berkeley.edu/cscce:

1. *Teacher Preparation and Professional Development in Grades K-12 and in Early Care and Education: Differences and Similarities, and Implications for Research*
2. *Effective Teacher Preparation in Early Care and Education: Toward a Comprehensive Research Agenda*

Introduction

Across the political spectrum, high-quality early care and education (ECE) is viewed as essential to educational reform. An early learning agenda is a cornerstone of President Obama's education plan, and many governors and state legislatures continue to support publicly funded preschool even while cutting other essential services. High-quality early learning environments are critical to closing the achievement gap between children living in poverty, especially children of color, and their peers (Gormley, Gayer, Phillips & Dawson, 2004; Henry, Gordon, Henderson & Ponder, 2003; King, 2006; Reynolds, Temple, Robertson & Mann, 2001; Schulman, 2005; Schulman & Barnett, 2005; Schweinhart, Montie, Xiang, Barnett, Belfield, & Nores, 2005). Yet far too many children across the economic spectrum attend early care and education programs that are of insufficient quality to promote their learning and development (e.g., Karoly, Ghosh-Dastidar, Zellman, Perlman, & Fernyhough, 2008).

No ECE program can succeed without teachers who can establish warm and caring relationships with children, light the fires of children's curiosity and love of learning, and foster their development and readiness for school. But what is the best way to prepare skilled and effective teachers of young children? And how can ECE programs best support teachers in continuing to learn and grow as professionals, implementing the approaches to early care and education that they have been taught?

These questions have major implications for policy, practice and research in the early care and education field, where, for many years, the entry requirements to work as a teacher have been very low. Although teachers in many publicly funded preschool and Head Start programs are now required to obtain a bachelor's degree and a specialization or certification in early childhood education, expectations for staff in other ECE programs typically remain limited to a certain number of training hours or college credits, well short of a degree (Barnett, Hustedt, Friedman, Boyd, & Ainsworth, 2007; National Child Care Information Center, 2007). Practitioners and policy makers are increasingly embracing higher qualifications for ECE teachers, confident that these will lead to better care for children—while others continue to question the value of additional education beyond a two-year degree.

In K-12 education, too, highly politicized issues are at stake, with much ongoing controversy about the merits of certification, the value of college and university schools of education, teacher accountability for student outcomes, the best ways to measure teacher effectiveness, and how to guide new teachers through the critical first five years of service. And to differing degrees, both the ECE and K-12 fields struggle with low teacher pay, and how to reward and retain an educated, skilled, and diverse workforce.

Given an increasing emphasis on evidence-based policy and practice, many have turned to the existing research literature—both from ECE and from K-12 education—for answers about the most appropriate and effective types of teacher preparation and professional development. Ideally, the scientific wisdom and evidence accrued in one sector of education should inform and advance research, policy, and practice in the other. But because infrastructures and career pathways are so different in these two fields, researchers in K-12 and in ECE have tended to pose questions and formulate answers in dramatically different ways.

The purpose of this two-part paper is to help bridge the worlds of ECE and K-12, and to help shape a coordinated research agenda, by examining their differing vantage points, language, and terminology, and the current state of knowledge about the effective preparation of excellent teachers. Part I summarizes the differences between these two fields, but finds more than enough similarities to warrant a close consideration, in Part II, of the combined wisdom of both fields, and of what remains to be learned, about teacher preparation—concluding with a set of key recommendations for research and policy.

Part I: Teacher Preparation and Professional Development in Grades K-12 and in Early Care and Education: Differences and Similarities

Before we can bridge these two worlds, it is essential to take account of their differences and similarities along the following dimensions:

- Delivery systems, standards, and educational requirements;
- Teacher education, certification, and career pathways;
- Teacher preparation vs. professional development;
- Fieldwork;
- Induction, mentoring, and professional development; and
- Teachers' work environments.

Table 1. Comparison of K-12 and ECE Systems

	Grades K-12	Early Care and Education
Delivery systems, standards, and educational requirements	Public K-12 education was established to provide free access to education for all children in the nation, because a well-educated populace was viewed as a public good. Across states and communities, schools are typically organized into districts, with local governing bodies, state and federal oversight, and local, state, and national funding. Federal funds are a minority portion of K-12 financing, but federal legislation such as No Child Left Behind (NCLB) sets standards for teacher qualifications, and requires accountability and reporting from states and school districts.	ECE programs originate in two separate historical traditions—some primarily to care for children while their parents worked, others to promote early learning. U.S. society has not fully embraced ECE as a public good. As a result, more than 20 federal ECE funding and regulatory streams exist, and all 50 states have their own array of differently funded and governed programs. There are no structures akin to school districts for all ECE programs, no federal laws like NCLB that set uniform expectations about teacher qualifications, and no uniform accountability or reporting systems.
Teacher education, certification, and career pathways	Professional standards define teachers relatively uniformly across school districts and states, and require all public school teachers to have at least a BA degree, and provisional or actual certification, before they can begin teaching. All states have procedures for certifying public school teachers, and all public schools are expected to hire teachers who are state-certified.	Teacher qualification standards vary widely, based on program types and funding requirements—from little or no pre-service preparation, to a BA or higher—as do the actual qualifications of the teaching corps. Each state sets its own ECE teacher standards; the only exceptions are federal programs such as Head Start and Military Child Care. There is a far greater emphasis in ECE on in-service training, and/or on part-time college/university attendance while teaching, either to complete required credits or to earn a degree. Community colleges and community-based training organizations play the central roles in ECE teacher preparation.

	Grades K-12	Early Care and Education
Teacher preparation vs. professional development	In K-12, the term "teacher preparation" refers to pre-service education and training; "professional development" means in-service education and training. For all K-12 teachers, there is a presumed baseline of a bachelor's degree, typically from a college or university school of education, followed by induction and ongoing professional development after one begins teaching.	There is no common baseline of pre-service preparation. "Professional development" is a catchall phrase covering nearly the entire spectrum of education and training available in the field—from introductory training, to informal workshops or other continuing education, to college-level work for credit or a degree. Many ECE settings do not have a continuing education requirement for teachers.
Fieldwork	Thirty-eight states require beginning K-12 teachers to engage in fieldwork, such as student teaching—ranging from 5 to 20 weeks, and varying from community placements early in one's educational career, to stints of student teaching only after completing most coursework.	Since many teachers enter the workforce with little or no pre-service training or education, one's first teaching job typically doubles as "fieldwork," but rarely with the formal structure that this term implies.
Induction, mentoring, and professional development	K-12 education widely assumes that new teachers need a period of support in order to develop into effective practitioners who will remain in teaching careers. Federal (Title II) funding supports teacher quality improvement, including induction programs—which often pair a new teacher with a mentor who can model teaching practices, observe the teacher in the classroom, and provide feedback—and systems of ongoing professional development.	Induction is a much less familiar concept in ECE, and tends to be offered only to teachers in publicly funded preschool programs, e.g. those in school-based settings subject to No Child Left Behind. Professional development is often much less systematic, covering workshops, classes and other programs. Increasingly, however, ECE teachers are participating in professional development for a degree, and states are linking their professional development activities to an established set of competencies.
The teaching environment		
• **Number of adults in a classroom**	Most often, teachers in Grades K-12 are the only teachers in their classrooms, although they may work with an assistant, aide, or other paraprofessional. Co-teaching by peers with the same professional status is uncommon.	Co-teaching among a group of adults is frequent in classrooms and centers, because even a small number of young children requires the presence of more than one adult.
• **Class size and adult-child ratios***	A single teacher often works in a classroom environment with no assistant or aide, and adult-child ratios are rarely calculated or reported at the classroom level.	Class size and adult-child ratios are governed by state licensing regulations; these vary by the age of the child, with younger children typically in smaller groups with a higher adult-child ratio, but are often less stringent than the consensus judgment of the ECE field about standards for high quality.

* "Class size" refers to the maximum number of children permitted in a given classroom. An "adult-child ratio" is the maximum number of children permitted per adult.

	Grades K-12	Early Care and Education
• **Compensation**	K-12 public schools offer uniform pay scales, typically subject to collective bargaining, which detail benefits, raises, and rewards linked to teachers' educational levels, completion of continuing education, and tenure. "Merit pay" is also increasingly under discussion in states and school districts.	Teachers in ECE typically work for much lower wages than teachers in Grades K-12, and formal pay scales are rare; the main exceptions are public school-based ECE and pre-K programs, and some unionized ECE centers. Compensation varies by funding source, often carrying little or no reward for education or ongoing professional development.
• **Unionization**	All 50 states have teachers' unions and tenure laws, and 35 states and the District of Columbia have laws guaranteeing collective bargaining rights for K-12 teachers. In addition to salaries and benefits, unions can advocate for other improvements in teachers' work environment.	Unions do not have a strong presence in ECE field, with the exception of some Head Start programs and public school-based preschools, but unionization efforts appear to be increasing, especially in home-based settings.
• **Teacher retention and turnover**	The K-12 and ECE fields face widely differing turnover rates. Total replacement needs in 2006—i.e., the estimated job openings resulting from the flow of workers out of an occupation—were 9.8% for elementary school teachers (Bureau of Labor Statistics, 2008).	Total replacement needs in 2006 were 29.5% for those self-identified as child care workers, and 13.5% for preschool teachers (Bureau of Labor Statistics, 2008). But because ECE programs typically run year-round (not on a 9-month school calendar), and rely more heavily on a team approach, a child in ECE is much more likely to experience the departure of one or more teachers in a given year than is a child in K-12.
• **Administrative climate**	K-12 principals typically need an administrative credential, and/or a master's degree, and some prior teaching experience.	Only 20 states have some type of ECE director credential, and many set few or no preservice training or education requirements.

Implications for Research

The central importance of teachers in helping to shape student outcomes is unquestioned in both K-12 and ECE. Studies of K-12 students and teachers, for example, have demonstrated that students who have effective teachers for several years in a row outperform those who do not, and one research team concluded that students having even two ineffective teachers in a row are unlikely to recover (Sanders & Rivers, 1996, as cited in Huang, Yi, & Hancock, 2002). At least two ECE research reviews have drawn similar conclusions (Bowman, Donovan, & Burns, 2001; National Research Council & Institute of Medicine, 2000). Where K-12 and ECE research differ, however, is in how instructional quality has been defined and measured, spurred in part by differences in the policy concerns of, and types of data available in, the two fields. K-12 research has focused a great deal on teacher quality and teacher effectiveness as measured by student outcomes, but less on program quality or teacher behavior in the classroom. In contrast, ECE research has focused much more on program quality and teacher-child interactions.

To answer questions about teacher quality and effectiveness, K-12 researchers generally rely on administrative data collected by school districts, and on federally supported national surveys that assess teacher preparation, teacher qualifications, and student achievement. Where available, such data allow researchers to track teachers and students over time, and to link student

performance to the performance and background of specific teachers—with teacher quality and effectiveness primarily measured by student achievement test scores.

But the ECE field has few standardized approaches to collecting or reporting data about individual teachers or children, or about children's progress, either in a single year or over time. ECE data are much more limited, and much less likely to be linked to child outcomes, than in K-12. This has led to an emphasis on program rather than teacher quality, with most analyses focusing on the effects of teacher preparation on program quality, rather than on child outcomes. While data from student standardized tests are widely used and available in K-12, the appropriateness of basing funding and teacher retention or pay decisions on such data remains hotly debated. While standardized test data are much less available in ECE, their use in administrative decision-making is even more controversial in that field, because of additional concerns about the developmental appropriateness of standardized testing of young children, and the reliability of such assessments (Guddemi, 2003; Meisels, 2006; Snow & Van Hemel, 2008).

Part II: The Current State of Knowledge on Effective Teacher Preparation and Professional Development: A Review of K-12 and ECE Research, and Interviews with Key Informants

Arguments favoring higher levels of education for ECE teachers have been based on studies from the past few decades suggesting that the quality of care and instruction in center- and home-based ECE programs is higher when teachers hold BA degrees than when they do not (e.g., Burchinal, Cryer, Clifford, & Howes, 2002); that teachers with more education and training in child development interact more sensitively and less harshly with children (Howes, 1997); and that children are more likely to show better outcomes when their teachers have higher levels of education (Clarke-Stewart, Vandell, Burchinal, O'Brien, & McCartney, 2002; Howes, Whitebook, & Phillips, 1992; Weaver, 2002). Further, teachers in model programs demonstrating long-term benefits for children have all held BA degrees or higher levels of education (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Reynolds, 1997; Schweinhart et al., 2005).

Based on these and similar studies, many reviewers have concluded that the best-quality ECE programs are those in which teachers hold BA degrees, especially in child development or similar fields (Barnett, 2004; Bowman, Donovan, & Burns, 2001; Kelley & Camilli, 2007; Whitebook, 2003). Such research recommendations have helped lead to new standards in Head Start and state preschool programs that favor or require BA degrees for lead teachers, and for initiatives that help current ECE staff with tuition costs to attain BA degrees and/or reward those who achieve such degrees with stipends or higher wages. As of 2006-07, 27 publicly funded state pre-K programs required lead teachers to have BA degrees (Barnett et al., 2007).

Yet several recent studies have led others to re-examine the emphasis on college degrees for ECE teachers. Some studies have shown relationships between teacher credentials and student gains in math but not in other areas (Early, Bryant, Pianta, Clifford, Burchinal, et al., 2006), and even null or contradictory findings concerning the relationship between classroom quality, children's educational outcomes, and the educational attainment and majors of their teachers (Early, Maxwell, Burchinal, Alva, Bender, et al., 2007). Such findings have led to considerable debate in the ECE field about whether the effects of a BA degree are so small or unpredictable that requiring it for ECE teachers is unnecessary (Bogard, Traylor, & Takanishi, 2008; Early, Maxwell, Clifford, Pianta, Ritchie, et al., 2008; Fuller, Livas, & Bridges, 2006).

Ironically, the available research has done little to resolve the issue, leaving a serious gap in how well the current knowledge base can inform the pressing policy and practice questions of the day. Focusing on whether or not teachers need a BA or an AA reduces a complex issue to a single question about teacher preparation, quality, and child outcomes—a question that is both too narrow and also impossible to resolve with existing research. The question is too narrow because it fails to take into account the nature of the training that teachers have received en route to their degrees and the effects of the workplace environment on their teaching practice. Extant research, because it does not consider

such factors, can only yield incomplete and inconsistent answers to the BA question and to related concerns about teacher effectiveness.

Here, we aim to broaden the discussion, and expand the ECE research agenda on effective teacher preparation, by exploring three hypotheses—moving beyond a narrow focus on whether or not BA degrees make a difference for children, to a wider exploration of what it takes to develop and maintain teacher instructional practices that effectively promote children's development.

We drew on multiple sources of information. Relying on several recent literature reviews as starting points,[1] we explored the K-12 and ECE research literatures focused on teacher quality and effectiveness; schools of education, and other forms of teacher preparation and professional development; the workplace context; and the relationship of these factors to teacher behavior, teacher practice, and student performance. We supplemented this review by interviewing 32 key stakeholders, including ECE teacher educators in institutions of higher education or community agencies, funders with a particular interest in teacher effectiveness, program administrators working with teachers, policy or program administrators engaged in work related to teacher preparation, researchers focused on teacher education and/or early care and development, and experienced ECE teachers.

Hypothesis 1: Both the content and the method of delivery of an educational degree influence teacher practices.

Research that merely examines whether or not an ECE teacher has a BA does not tell us much about the training, preparation, and experience that the teacher was required to undertake to achieve the degree. What kinds of coursework were included in the BA requirements? What kinds of field experience did the teacher have, to apply what was learned in coursework? To what extent did this training address issues of culture and language, enabling the teacher to acknowledge and build upon the strengths of children from diverse backgrounds?

Teacher education varies dramatically with regard to what is taught, students' opportunities to apply what they have learned, the structure of adult learning environments, and the skill and knowledge of teacher educators. To the extent that research has focused on single ingredients of teacher education (e.g., certification in the K-12 literature, or one's level of formal education in ECE), the lack of consensus is predictable.

Our key informants emphasized three elements related to ECE teacher education in need of further investigation, and we reviewed the literature concerning these aspects:

1. Academic content that balances child development and pedagogy, and that emphasizes working with children from diverse cultural and linguistic backgrounds;
2. Opportunities for practice and reflection through field placements and professional development; and
3. Degree programs within institutions of higher education that support both students and teacher educators as adult learners.

Findings

- Both the content and the method of delivery of an educational degree influence teacher practice.
- For teachers of young children, an understanding of general child development is critically important, but it must be tied to pedagogical knowledge—the ability to put theoretical knowledge into practice.
- Coursework related to helping teachers understand and work with children from diverse cultural and linguistic backgrounds, and children with special needs, is important, but there is no consensus on how best to design or deliver such coursework.
- Longer fieldwork placements—including opportunities to reflect on and process fieldwork experi-

[1] In the K-12 literature, these included Boe, Cook, and Sunderland (2006); Cochran-Smith and Zeichner (2005); Darling-Hammond and Bransford (2005); Education Commission of the States (2003); Goe (2007); Ingersoll and Kralik (2004); Murnane and Steele (2007); Strong (2005); Wei et al. (2009); Wilson, Floden, and Ferrini-Mundy (2001); and Youngs, Odden, and Porter (2003). In the ECE literature, these included Bowman, Donovan, and Burns (2001); Klein and Gomby (2008); Whitebook (2003); and Zaslow and Martinez-Beck (2006).

ences, as well as guidance from experienced and trained mentors and supervising teachers—may yield better results in teacher practice than shorter-term activities.
- In early care and education, teacher preparation programs require skilled teacher educators with current knowledge in ECE, recent teaching experience in ECE classrooms, and experience with teaching adult learners.
- Financial and academic assistance are often critical in allowing working ECE students to enter and complete teacher education programs.
- The student cohort approach[2] appears particularly promising, and is increasingly being used in K-12 and ECE teacher preparation programs. In ECE, cohort degree programs are often coupled with supportive services that help working professionals negotiate the college experience.

Hypothesis 2: Teachers' ability to apply knowledge and skills effectively depends on whether or not they have opportunities and support for ongoing, on-the-job learning.

A teacher's current classroom performance is likely to reflect both her earlier educational experiences and the education and training she receives while on the job. Indeed, K-12 research indicates that new teachers are not as effective as teachers with years of experience (Loeb, Rouse, & Shorris, 2007; Hanushek & Rivkin, 2007; Boyd et al., 2007; Goldhaber, 2007; Walsh & Tracy, 2004)—at least up to about five years in the field (Goe, 2007). But while K-12 teachers typically take part in induction programs for new teachers and ongoing professional development, these are much less available for ECE teachers. Which approaches to ongoing professional development are most effective for working professionals?

Findings

- Opportunities and support for ongoing, on-the-job learning appear to be of critical importance in helping teachers become effective at what they do.
- Short-term interventions, however, whether for induction or professional development, are unlikely to be effective.
- Induction or other on-the-job professional development is likely to be most effective if it includes assistance from a skilled and well-trained mentor or coach.
- The skills and training of the mentor or coach are critical in determining the effectiveness of the services, but the current research base has not determined precisely what qualities the mentor or coach should possess.
- Peer support and relationships appear to matter in professional development activities, just as they seem to be beneficial in initial teacher preparation (e.g., student cohorts).

Hypothesis 3: Certain features of the work environment either support or hinder teachers in demonstrating their competence, and applying their knowledge and skills.

Even with the best education and training, teachers may be stymied in applying what they have learned if the various aspects of the teaching environment (summarized in Table 1) do not support them. Teachers may be unable to apply the instructional approaches they have learned if their workplace uses different or conflicting methods. Their performance may suffer, and they may leave the program or the ECE field altogether, if their wages and benefits are low, if the program director is unsupportive, or if there is high turnover among other program staff.

The research literature suggests that certain characteristics of the work environment are critically important in shaping teacher behavior, effectiveness, and retention. In the K-12 arena, researchers and commentators have considered the relationships between teacher retention and/or teacher effectiveness (as measured by changes in student test scores) and such workplace characteristics as class size, school size and organization, curriculum approaches, opportunities for teacher collaboration, teacher salaries, support from adminis-

[2] In this model, a group of perhaps 10 to 25 students begins a program of study together, takes classes together, and ends the program at approximately the same time. The benefits of such an approach are thought to include more active student participation, increased social and emotional support, and reduced attrition from the education program (Agnew, Mertzman, Longwell-Grice, & Saffold, 2008).

trators and parents, and school safety (e.g., Bransford, Darling-Hammond, & LePage, 2005; Loeb, Rouse, & Shorris, 2007; Murnane & Steele, 2007).

ECE research has investigated an overlapping, but more limited, set of workplace characteristics (e.g., adult-child ratios and group sizes, staff compensation, the effects of peers (other teachers in the program), and the program's administrative leadership. Researchers have typically linked these characteristics to differences in program quality (as measured by global assessments) and/or to staff retention or turnover; less often to measures of child development; and not at all to teacher effectiveness as operationalized in the K-12 literature.

Findings

- The work environment can support or hinder teacher performance.
- Appropriate group sizes and ratios are minimal requirements that permit teachers to establish relationships with the children in their care.
- Compensation strongly affects teachers' willingness to enter and stay in the field; ECE research, given the particular problems of low compensation and high turnover in that field, has also demonstrated that students of higher-paid teachers achieve better outcomes.
- Unionization, while extensive in the K-12 arena but still uncommon in ECE, is clearly associated with better compensation in both fields.
- Both K-12 and ECE researchers view teacher turnover as a negative outcome, but neither field has definitively identified the teacher preparation or professional development factors that reduce turnover.
- In K-12 and ECE, the role of the principal or director is critical in facilitating teacher retention, professional development opportunities, and a well-functioning program.

Conclusion and Recommendations

Our three hypotheses suggest that research on teacher preparation and practice will be incomplete, and will yield inconclusive answers, unless it takes into account the quality and content of teachers' pre-service and in-service training and educational experiences, and the support that is afforded them in their workplaces. Further, they suggest that a combination of approaches is the best way to influence teacher performance, quality, and effectiveness. Our review of the K-12 and ECE literature generally supports these hypotheses, and based on both the literature and professional wisdom in the field, we offer a series of recommendations for future research and policy.

General Recommendations for K-12 and ECE Research

To create a more robust knowledge base about effective teacher preparation and professional development, we recommend:

1. *A cross-systems approach.* We encourage researchers, policymakers, and practitioners to abandon a "silo" view of K-12 as one world and ECE as another, and instead to approach their efforts with an eye to recognizing and understanding differences, working toward shared terminology, and building collaborative research agendas that will enable both arenas to learn from one another.
2. *An "ecological" framework.* K-12 and ECE research should be based on an understanding of the multiple contextual factors that influence teacher learning and behavior—paying specific attention to (a) what forms of education, training, and support are best for teachers in different circumstances and/or at different stages of their careers; (b) how pre-service education, in-service professional development, and workplace environments all interact to help teachers build and maintain good practice; and (c) how these factors may lead to change over time. Researchers should develop and employ new methods that are capable of tracking the interplay of complex, multiple factors over time—for example, measuring the content and delivery of teacher education and professional development, across a wide variety of programs and approaches.
3. *A clearer focus on outcomes.* As much as possible, future studies of teacher education and professional development should focus on tracking changes in *teacher attitudes or beliefs*, changes in *teacher behavior and performance*, and changes in *child learning and*

development. To the extent that research studies can capture bottom-line outcomes regarding all these "links in the chain," policy makers and practitioners will begin to have the evidence they need to make decisions about the optimal direction and focus of teacher education and training resources.

4. *A new ECE data infrastructure.* For early care and education in particular, progress in fulfilling these general recommendations will require a significant new federal investment in a data infrastructure. We recommend the development of a first-ever national ECE workforce data system to provide information compatible with state- and national-level data collected about K-12 teachers.
5. *Evaluation of publicly funded teacher preparation, induction, and professional development.* We recommend a public investment in rigorous evaluative research of a variety of program models for K-12 and ECE teacher preparation, induction, and professional development, particularly to ensure that publicly funded strategies are effective in improving teacher performance and, ultimately, outcomes for children.

Recommendations for ECE Research, Related to the Three Hypotheses

Hypothesis 1: Both the content and the method of delivery of an educational degree influence teacher practices.

We recommend federal leadership in building a research agenda on ECE teacher effectiveness, supporting studies that:

1. *Propose, and test, critical elements of early childhood teacher preparation programs.* This process could begin with the convening of an expert advisory group, including teachers, who would propose the set of critical elements to guide this research.
2. *Examine and test different approaches* to:
   - The educational content of teacher preparation curricula;
   - The design of fieldwork or practicum experiences in terms of intensity, duration, setting, when it occurs in one's career, and the professional preparation of instructors and supervisors;
   - The structure of teacher preparation programs (e.g., student cohort models, intensive weekend and/or summer sessions, online components).
3. *Analyze varied approaches to preparing teachers to work with children from diverse linguistic and cultural backgrounds, children of different ages, and children with special needs*—using experimental designs, where possible, to identify those that are most effective at building knowledge and skills among various teacher populations and at producing positive outcomes for children.

Hypothesis 2: Teachers' ability to apply knowledge and skills effectively depends on whether or not they have opportunities and support for ongoing, on-the-job learning.

We recommend federal leadership in supporting experimental studies and analyses of existing data that:

1. *Include longitudinal designs* to trace the effects of professional development on short- and long-term changes in teacher instructional practice, and on children's short- and long-term learning and social-emotional well being;
2. *Examine the components of specific strategies*, to tease out the effectiveness of such approaches as workshops, coaching, shared planning time, and reflection (often combined into a single professional development program), and the effectiveness of the program as a whole. Compare approaches of differing duration and intensity.
3. *Explore the impact of varied strategies at different stages of teachers' careers* (e.g., new to the field with no previous preparation or professional development; working in the field with limited preparation and professional development; and working in the field with some college experience and/or a degree).
4. *Study efforts that involve individual teachers, vs. teaching and administrative teams* (e.g., lead teachers, assistants, aides, and directors), to better understand how peer relationships and shared access to information can influence teacher practice.
5. *Build the knowledge base about the most effective components of coaching and mentoring*, by examining variations in coaches'/mentors' backgrounds and their specific training related to working with adult learners; and the amount of coaching/mentor-

ing that leads to short-term or lasting change in teacher practice.

Hypothesis 3: Certain features of the work environment either support or hinder teachers in demonstrating their competence, and applying their knowledge and skills.

We recommend federal leadership in supporting studies of ECE teacher effectiveness that:

1. *Include, as variables of interest that may influence teacher practice, aspects of the teaching work environment*, such as adult-child ratios, compensation, unionization, teacher retention and turnover, and the leadership and professional preparation of administrators.
2. *Examine the role of ECE center directors in contributing to improved teacher practice and program quality*, by assessing their background and professional preparation, and the supports available to them.

Implications for Public Policy: Two Final Recommendations

A research agenda is also a policy agenda. Building our knowledge of what it takes to become an effective teacher will require sustained public investment, and political leadership that understands the importance of answering these research questions in order to transform American education in the twenty-first century. We also need leadership that is ready and willing, based on what we already know, to move forward in transforming early care and education—not waiting for the elusive day when researchers have uncovered all the answers.

Research has already demonstrated that certain issues and barriers are preventing many teachers of young children from doing the best they can. These include limited opportunities to pursue higher education for a degree while already working as teachers; poor compensation; and professional development programs that are too often superficial, short-term, or disconnected from daily teaching practice.

Teacher preparation in ECE must be aligned with our knowledge about the importance of early learning, and as a society, we must invest in the experimentation and research that will help us to prepare and support teachers to deliver on the promise of early learning. Our efforts in ECE will be enhanced to the degree that we join together with efforts in Grades K-12, given that the issues and challenges facing the two fields are more alike than different. We therefore propose two final recommendations that cross over from research to policy. We urge federal leadership and support in developing:

1. *Increased investment in two-year, four-year, and graduate ECE degree programs in institutions of higher education.* It is urgent to build the capacity of ECE teacher preparation programs, which currently face heavy teaching loads and inadequate staffing, in order to meet the need for an expanded, high-quality early care and education system that meets the diverse needs of American's young children and families. Such program expansions should be attached to funding for research that examines the critical and most effective elements of ECE teacher preparation, as a guide to future investments. These programs should be designed with features already shown to help working adults succeed in higher education, including flexible schedules and locations, and academic and financial assistance.
2. *A system of program grants for ongoing professional development for ECE teachers*—again, designed with the features most likely to foster improved teacher practice, including the presence of experienced and trained mentors or coaches, longer-term efforts with follow-up support (rather than piecemeal or one-short workshop approaches), and opportunities for reflection and discussion in the workplace about what is being taught.

Across all levels of education, America faces an urgent need to improve teacher preparation, create incentives for ongoing learning and growth in the teaching profession, and build reliable career pathways that reward accomplished teachers for their expertise (Obama & Biden, 2009). A sustained research agenda, based on the investments we propose here, will go a long way toward expanding our knowledge—and moving beyond suppositions, assumptions, and circular debates—about how to assure excellent, well-prepared teachers for American children of all ages.

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