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

PART 2: Effective Teacher Preparation in Early Care and Education: Toward a Comprehensive Research Agenda



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Part I, *Teacher preparation and professional development in grades K-12 and in early care and education: Differences and similarities, and implications for research*, is available at: <http://www.irle.berkeley.edu/cscce/>.

An *Executive Summary* of the two papers is also available at the same site.

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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 despite these lofty aims, 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, 2007a).

Practitioners and policy makers, however, are increasingly embracing higher qualifications for ECE teachers, confident that these will lead to better care for children. In particular, when qualifications are linked to resources that help current staff gain access to higher education, complete their degrees, and earn higher salaries, these policies are seen as a strategy to address persistent workforce challenges around recruitment, retention, ethnic and racial stratification, and an inadequate leadership pipeline. Yet others have questioned the value of additional education beyond a two-year degree. Some argue that higher qualifications will force a number of current members of the workforce out of their jobs; doubt whether higher education could absorb the new demands resulting from these added teacher requirements; and/or question whether the attendant costs are a valuable use of ECE funds, particularly when so many additional children are in need of services. Passionate debate has ensued, spanning the pressing questions of how best to meet young children's needs, how to ensure an ethnically and linguistically diverse ECE workforce, and how to transform the teaching of young children into a viable, stable profession (Bogard, Takanishi, & Traylor, 2008; Calderon, 2005; Early, Maxwell, Clifford, Pianta, Ritchie, et al., 2008; Fuller, Livas, & Bridges, 2006).

Given an increasing emphasis on evidence-based policy and practice, many have turned to the existing research literature for answers about the most appropriate and effective types of educational preparation for ECE teachers. Arguments favoring higher levels of education have been based on certain 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). Specifically, teachers with more education and training in child development have been found to interact more sensitively and less harshly with children (Howes, 1997). Both in centers and in family child care homes, 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; Kelley & Camilli, 2007; Whitebook, 2003). “Each group of children in an early childhood education and care program,” the National Academy of Sciences Committee on Early Childhood Pedagogy advised, “should be assigned a teacher who has a bachelor’s degree with specialized education related to early childhood” (Bowman, Donovan, & Burns, 2001, p. 13). Such research and 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. The field has spent considerable energy overstating inconclusive evidence,

framing opinions as fact (e.g., college-educated teachers are rarely any better than those with less education), and disregarding professional wisdom about the essential components of effective teacher education. Yet in the absence of definitive evidence—which is all too frequently the case, since science moves at a different pace than policy and practice—Shonkoff and others argue that researchers should seek out the hypotheses of those with professional wisdom and experience, and investigate new questions emanating from them, in order to build a better knowledge base for decision making (Buysse & Wesley, 2006; Shonkoff, 2000).

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 impossible to resolve with the research that has been conducted to date. The question is too narrow because it fails to take into account the precise nature of the training that teachers have received en route to their degrees, and the effects of the workplace environment on their teaching practice. Further, the question about BAs cannot be answered by extant research because research thus far has not simultaneously considered these important contextual issues. Unless we do so, research will necessarily yield incomplete and inconsistent answers to the BA question and to related questions about teacher effectiveness.

This paper aims to broaden the discussion about effective teacher preparation. Specifically, it explores three hypotheses designed to expand the ECE research agenda, and to move the field 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:

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

Research that merely examines whether or not a 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?

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. Does the ECE program provide financial and technical support to teachers who seek additional professional development and training? Does the program provide opportunities for teachers to engage in reflection with colleagues about their classroom practices? Which approaches to ongoing professional development are most effective for working professionals?

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 workplace conditions 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.

Some ECE researchers have begun to explore these questions. For example, some research related to Hypothesis 3 indicates that ECE program quality and

child outcomes are influenced by workplace characteristics, and, specifically, by the extent to which the work environment supports its teaching workforce. In addition, teacher compensation has been linked with teacher turnover, which in turn is associated with program quality and child outcomes (Whitebook & Sakai, 2004). There is also a growing recognition that effective ECE program management is critical for ensuring program quality (Lower & Cassidy, 2007; Vu, Jeon, & Howes, 2008; Whitebook & Sakai, 2004).

Yet many gaps in ECE research remain. A recent extensive review of the ECE research literature revealed few studies, for example, that systematically varied professional development and teacher preparation in order to explore its effects on teacher practices or children's learning outcomes, or to investigate necessary threshold dosage levels, optimal content, or possible mediating effects of teacher or program characteristics (Zaslow & Martinez-Beck, 2006). An ecological rather than piecemeal approach to understanding teacher preparation—i.e., one that considers a range of contextual variables—has yet to be thoroughly implemented.

This paper seeks to expand the discussion by drawing on multiple sources of information. (For a description of our methods, see the Appendix.) We began with an exploration of the K-12 and ECE research literatures, to help create a new framework for understanding influences on ECE teacher behavior, quality, effectiveness, and retention. Specifically, we examined research 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 and instructional practice, and to student performance. Since each of these topics has a broad research literature, we relied on recent key literature reviews as starting points. We believe that incorporating findings from the K-12 research literature into a discussion of ECE teacher preparation makes sense for several reasons:

- Despite the differences between the ECE and K-12 worlds,¹ some similar questions have been

¹ See the accompanying paper, "Teacher Preparation and Professional Development in Grades K-12 and in Early Care and Education: Differences and Similarities, and Implications for Research."

explored, and both the findings and the research methods of K-12 research can be informative for ECE;

- The two worlds are coming into closer alignment, with many state preschool initiatives seeking educational linkages and compensation parity for preschool and K-12 teachers. As such initiatives are extended, there is likely to be even more intersection between the two fields: ECE and K-12 teachers will attend the same college- or university-based teaching preparation programs, they will have to meet the same requirements for certification and continuing education, and they will probably encounter the same approaches toward ongoing professional development.
- Like the ECE research literature, the K-12 literature increasingly recognizes that more sophisticated analytical approaches are required for capturing the complexity of what contributes to teacher quality and effectiveness (e.g., Cochran-Smith & Zeichner, 2005).

Focusing on Hypothesis 1—the content and methods of degree programs for teacher preparation—we supplemented this literature review by interviewing 22 key stakeholders, including 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, and researchers focused on teacher education and/or early care and development. We also engaged in lengthy conversations with 10 experienced teachers from a wide range of educational backgrounds, as they were preparing to participate in a program in which they would mentor less experienced teachers.

Because neither the ECE nor the K-12 research literatures provide definitive answers on ideal ways to prepare effective teachers, we believe that the interviews we conducted are very important. Policy and practice decisions cannot wait for “perfect” studies to be completed, and so we, just as policy makers and program administrators do every day, rely on multiple forms of evidence to reach conclusions about what we know, what we do not know, and where further research is needed about how best to develop effective teachers for young children.

The three sections of this paper focus on issues related to: the content and structure of teacher education (Hypothesis 1), what is known or theorized about supports for ongoing learning on the job (Hypothesis 2), and the workforce conditions that support or impede positive teacher practice (Hypothesis 3).

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

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.² While states may use the same tests to certify K-12 teachers, for example, they set different thresholds for establishing competence. In ECE, teachers with bachelor's degrees may have majored in any of a number of disciplines, not all of which focus on young children or require similar types of fieldwork.

For Grades K-12, teacher education typically takes place in schools of education at four-year and graduate institutions of higher education, with minimal involvement by community colleges. But in ECE, in most states, despite the growing involvement of four-year and graduate institutions in response to BA degree requirements for some Head Start and preschool teachers, teacher preparation generally occurs at the community college level. Higher education-based early childhood education programs may occur in schools of education—typically geared to teaching children from preschool through the early elementary grades—but ECE-related programs may also occur in other schools or departments, often covering a much wider age span, such as Child Development, Human Development, Psychology, or Family and Consumer Sciences. Further, although some have a specialized, applied focus on working with young children, such programs are not necessarily geared to teacher preparation at all.

In order to deepen our understanding of the value of particular types and levels of education for teachers, we

sought to learn more about the variations among teacher education programs, and the particular experiences of individual teachers. Our key informants emphasized three elements related to ECE teacher education in need of further investigation, and we reviewed the research literature focusing on these elements:

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
3. Program structures that support both students and teacher educators as adult learners.

The Content of Coursework

In traditional teacher preparation programs, required content generally falls into three areas (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2007):

- *Foundational* courses that cover theories of learning and development, the philosophy or history of education, and multicultural education;
- *Pedagogical* courses that focus on methods of teaching or classroom management in general, or as related to particular subject areas (e.g., how best to teach reading);
- *Content or subject matter* courses (e.g., English or math courses).

For early childhood teachers, subject matter has typically focused on child development, but increasingly, teacher preparation and professional development are addressing issues of pre-literacy, pre-math, and pre-science for young children. In contrast with K-12, however, where all teachers begin with BA degrees, the challenge for ECE is how best to convey such information to current teachers and prospective teachers who have widely varying educational backgrounds (Frede, Jung, Barnett, Lamy, & Figueras, 2007).

² Although there is no policy argument within the K-12 field about requiring a BA degree for teachers, there is considerable debate about whether or not to require certification, and a great deal of research has been conducted to see whether teachers who enter via an alternate route to certification are as effective as those who enter via traditional routes. In ways that are reminiscent of the ECE debate concerning BA degrees, some in K-12 are now shifting the debate about certification to a focus on the qualities of a good alternate teacher preparation program (e.g., Education Commission of the States, 2003; Wilson, Floden, & Ferrini-Mundy, 2001) and other variables that could affect the results of analyses of teacher effectiveness (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2007; Goldhaber, 2007; Harris & Sass, 2007; Walsh & Jacobs, 2007).

Interviews with Key Informants

Our interviewees in the ECE field emphasized that teacher preparation programs should begin with core content on child development, but that such content should inform pedagogy with young children. They also shared a key concern: the importance of integrating and retaining the concepts of developmentally appropriate practice within the context of an increasing focus on young children's academic skills and school readiness:

We're not doing a good enough job in training teachers on basic early child development and expectations for what children are like at age three and four. There is so little teaching going on [in many ECE programs] because teachers don't know what young children can and should be asked to do. They have inappropriate behavioral expectations, and so they spend their time trying to make them sit still or be quiet, instead of engaging them in learning.

There are courses on child development, and there are courses about how you teach early math. But I'm not sure there's a course on how you employ those teaching skills within the context of the child development information.

Students may understand enough child development to know how to develop rapport and relationships with young children, but they often do not know how to advance learning. Those are two different things.

You've got to teach students about [educational] philosophy so that they can think about what their own philosophy is—but then you've got to teach them what you do when you actually go out and try to work with a particular approach.

You can be a dance critic, but that doesn't mean you can dance. We teach an ideal, but we don't teach students how to apply it, or how to be flexible and inventive, building on children's competence.

Several interviewees reflected on the changing demographics of the young child population, with questions about everything from the accuracy of the knowledge base being conveyed in current courses to the difficulty of overcoming teacher candidates' own biases. As one interviewee put it, most of the child development research literature is based on “a middle-class, white, monolingual model of child development that's put forth as *the* model. Ninety percent of the research is done on five percent of the children of the world, and so we have a really narrow view of human development.”

Interviewees felt that institutions of higher education should provide more and better teacher training on issues of diversity, poverty, and especially, working with young English Language Learners:

Diversity is *the* area of content in which I know that our institution and other institutions have been negligent and deficient. So students don't get the issues of urban poverty, and I have to spend a lot of time on this so they won't judge inappropriately what parents, teachers, or children are doing. They need to be taught more about situational factors like culture and social class.

We're not preparing teachers to deal with English Language Learners. When I'm out in the field, or talking with trainers who deal with these issues, I'm hearing that ECE students and teachers just don't know about language development in general.

Linguistic and cultural diversity should be viewed as a resource, not as a problem. Learning two languages doesn't confuse children. Our teacher education programs have to be organized around these facts. Failing to support a child's home language is like damaging the roots of a plant by plucking off the top.

One interviewee noted, however, that courses aimed at helping teachers address student diversity are not always effective in overcoming biases:

You can have a kind of normative black child development notion, not deficit-based or any of that, but internalizing this doesn't automatically mean that you are comfortable teaching black children or see them as people who can achieve. The problem of teacher bias is a very big issue.

K-12 and ECE Research

Only limited conclusions can be drawn from the K-12 research literature concerning the academic content of teacher preparation coursework, due to both the scarcity of studies and their mixed quality (Loeb, Rouse, & Shorris, 2007). Much of the existing research has been qualitative in nature, not tracking the impact of courses on students' short- or long-term teaching practice. A recent comprehensive review of the field concluded that most studies showed teaching candidates had learned the information presented in their courses, but could not tell whether such information affected teacher practices or child outcomes (Cochran-Smith & Zeichner, 2005). Nevertheless, there is some agreement across reviews that subject-matter pedagogy may improve student achievement (Boyd et al., 2007; Education Commission of the States [ECS], 2003; National Council for Accreditation of Teacher Education [NCATE], n.d.), but less agreement that other kinds of general pedagogical content influence student achievement (ECS, 2003). An additional challenge for prospective teachers arises when the instructional approaches espoused in their teacher education courses are not congruent with those of their fieldwork supervisors or of the school settings in which they find themselves teaching (Cochran-Smith & Zeichner, 2005).

Research on K-12 teachers suggests that students in upper grades perform better on standardized tests when their teachers have taken undergraduate courses in the subjects they are teaching, but there is less evidence that such training matters in earlier grades (Goe, 2007; ECS, 2003). Some reviewers have suggested that the most important subject matter for elementary teachers is the latest research concerning children's neural, physical, cognitive, social, emotional, and language development (National Institute of Child Health and Human Development [NICHD] & National Coun-

cil for Accreditation of Teacher Education [NCATE], 2006). Common sense suggests that this would likewise be true for teachers of even younger children.

Some K-12 teacher preparation programs include coursework designed to help teachers work effectively with students of color. Such programs adopt one or more of three basic approaches (Cochran-Smith & Zeichner, 2005):

- *Prejudice reduction*: courses are designed to reduce prejudice by highlighting how candidates' prior experiences, early socialization, and ways of thinking influence their attitudes and beliefs.
- *Equity pedagogy*: Courses focus on how teachers can recognize and use students' cultural and experiential backgrounds to facilitate learning and to provide them with the skills to develop a more equitable society.
- *Field experiences*: Examples of this approach are community-based fieldwork, placing candidates to urban settings or other areas of high need, and applying multicultural knowledge to classroom practice.

A recent literature review suggests that most studies of such coursework aimed at helping teachers work effectively with diverse students have been qualitative, employing surveys or questionnaires (not all of them validated) to assess changes in teaching candidates' beliefs and attitudes (Cochran-Smith & Zeichner, 2005). Most have not traced the effects of coursework to changes either in teacher instructional practices or in student achievement. The results of these approaches are therefore largely unknown, with some reviewers finding "limited support for the conclusion that deliberate efforts to prepare teachers to teach in urban low-performing schools can be beneficial" (ECS, 2003, p. 5).

There is, however, some research on experiences of teacher candidates of color suggesting that certain approaches, such as student cohort programs (described below), can help eliminate barriers to entry that these candidates may experience (Cochran-Smith & Zeichner, 2005).

Increasingly, schools of education have focused on

preparing teaching candidates to teach students with disabilities. Such coursework is typically taught by general teacher education faculty, sometimes in collaboration with special education faculty. A recent review reports that the general teacher education faculty who teach these classes do not always feel prepared or confident about their ability to provide good instruction. The same review reports that most of the available research studies on the effectiveness of this coursework are descriptive in nature, or focus only on short-term outcomes, and rarely include measures of child learning, so that no firm conclusions can be drawn about the approaches used (Cochran-Smith & Zeichner, 2005).

In the ECE field, much of the research and theory has been focused on how to educate young children, identifying the skills and knowledge that teachers need in order to deliver on the promise of high-quality early childhood education (Bowman, Donovan, & Burns, 2001). But while a great deal of public investment has been targeted in recent years toward training and college coursework for the ECE teaching workforce, there has been very little research about the academic content or effectiveness of such teacher education, with the exception of some inventories of course offerings by topic. These inventories have cited insufficient attention in teacher education curricula to issues related to dual language learning, infants and toddlers, children with special needs, and child and family diversity (Maxwell, Lim, & Early, 2006; Ray, Bowman, & Robbins, 2006; Whitebook, Bellm, Lee, & Sakai, 2005).

Opportunities for Practice: Fieldwork Experience

Prospective teachers need opportunities to put into practice what they have learned in their coursework, a fact recognized by the 38 states that make field experiences a part of the requirements for new K-12 teachers (Boyd et al., 2007).

In K-12 settings, fieldwork can vary from placements in community settings with children and families, starting early in a prospective teacher's educational career, to stints of student teaching occurring only after the completion of most coursework. State requirements for fieldwork range in length from five to 20 weeks

(Boyd et al., 2007). By contrast, many teachers enter the ECE workforce with little related educational background and no field experience; a formal, supervised practicum, if it occurs at all, may come only after one has been employed as a teacher for several or many years.

Interviews with Key Informants

Interviewees strongly endorsed fieldwork as an integral part of good teacher preparation, and lamented that such experiences are limited for many ECE students, noting that high-quality fieldwork placements can be hard to find:

Just to say, "Have more practicum experience," isn't the answer, because the available placements often aren't very good.

We're harming our students to some degree by putting them out there in poor-quality places.

Others noted that, even when the solution of having better-quality placements isn't possible, teacher education programs must create opportunities to reflect on and process one's fieldwork experiences—and that requires significant training for mentors or supervising teachers:

Students appreciate it when they get to bring back those issues where there's a mismatch between what they're learning and what they're seeing out there.

It helps to see both amazing and not-so-amazing teachers. An excellent teacher gives you a model to work toward, but seeing mistakes can also help you think about how to do things differently.

If we can process the experience, it helps—but there is only so much that you can learn if the place is bad. Part of the problem, also, is that it's unpredictable with regard to the supervising teachers. Some training is essential.

Several interviewees also noted the particular chal-

lenges that can arise in placing experienced teachers in fieldwork settings:

Students who are in our classes “post-service” may be coming in with the mindset, “This is how I’ve been doing it, and it’s working just fine, thank you—and in fact, I am going to defend what I already do every time you raise something new.” Others, of course, are energized by hearing about new approaches.

The interviewees also preferred longer placements:

Sixteen weeks is not enough. A full year is better; it costs more, but the students who do this come out much better prepared. They know so much about classroom management and discipline, the dynamics of organizing and running a classroom, teaching content and still attending to individual children.

One interviewee described an approach that broadens fieldwork to include placements in a range of child- and family-serving agencies, beginning very early in a teacher candidate’s training:

One model that appears to be strong is to define field experience in the most open way. It could include a home visit, or observing in the beginning without doing much yourself in terms of interaction with children. This can start very early, maybe in the first semester, and be integrated into other courses. It might not be a practicum course; it could be Introduction to Early Childhood Education, but it would include some parent interviews, family interviews, maybe a home visit, going to three different kinds of ECE programs and observing and reflecting on what you see. The idea is to begin with something like that, and then build students’ awareness of different kinds of programs, different children and families they’ll be working with, culminating in a field experience where the student is essentially a lead teacher and has to plan a curriculum and reflect on it, assess a child, and so on.

Finally, several interviewees noted that for working BA candidates, fieldwork experiences must be arranged in such a way that they don’t interfere with keeping one’s existing job.

K-12 and ECE Research

There are no comprehensive data about fieldwork experience among ECE teachers, with research on this topic generally restricted to small qualitative studies. Even studies examining education level and teacher quality have failed to include fieldwork or student teaching with young children as a variable of interest (Early et al., 2007; Whitebook, 2003).

For K-12 teachers, by contrast, fieldwork placements have been a much greater subject of discussion and investigation. K-12 researchers have described the ideal placement as one in which student teachers are “supported by purposeful coaching from an expert cooperating teacher in the same teaching field who offers modeling, co-planning, frequent feedback, repeated opportunities to practice, and reflection upon practice while the student teacher gradually takes on more responsibility” (Darling-Hammond, Hammerness, Grossman, Rust, & Shulman, 2005, p. 409). But researchers differ on whether or not there is evidence that such an ideal arrangement, or any other, is associated with better outcomes for children. Most reviewers conclude that the research is inconclusive (ECS, 2003), largely because most research merely assesses the effects of field placements on teacher candidates’ beliefs and attitudes, not on either short-term or long-term teaching practices (Cochran-Smith & Zeichner, 2005), or because of the limited quality of studies to date (Loeb, Rouse, & Shorris, 2007; Boyd et al., 2007). No research has sorted out the particular content or duration of fieldwork experiences that is most beneficial (Boyd et al., 2007).

Complicating the research and its interpretation is the fact that, just as our ECE interviewees reported, many field placements fall far short of the ideal. Student teachers can be relegated to observing but rarely teaching; the amount of mentoring a student teacher receives can range from intense to non-existent; and the skills of mentors vary widely, although there is little

systematic research on what the best mentor teacher or coach should do. Still, at least one review has concluded that longer student teaching experiences, especially coupled with concurrent theoretical coursework, are associated with teachers' increased ability to apply learning to practice (Darling-Hammond et al., 2005).³

Program Structure and Personnel

Next, we turned to the structure and staffing of teacher preparation programs themselves, addressing such issues as how well these programs reflect the needs of their student populations, and the qualifications and training of teacher educators.

Interviews with Key Informants

Early care and education teacher preparation, to a far greater extent than K-12, serves both a traditional and a nontraditional student clientele (Dukakis & Bellm, 2006). Frequently, recent high school graduates are studying side by side with older adults, many of whom have been working with children for a number of years. Both groups may include students who are among the first generation of their families to attend college; most work while attending school; and for many, English is not a first language. One interviewee expressed a common sentiment:

We need to construct [ECE teacher preparation] programs through the lenses of the people we are serving. This will vary by geography, language, prior experience in higher education, and programs where they work.

Doing business as usual in teacher education will not build the qualified and diverse workforce that we need. The quality of the degree program matters. We need programs that meet professional standards related to content and

field experiences, and that assess students' ability to apply knowledge in practice. And we need delivery methods, like cohort programs, that offer a community of learners who support each other.

Our informants also felt that programs should be held to more uniform standards. Many suggested accreditation by the National Association for the Education of Young Children (NAEYC) or the National Council for Accreditation of Teacher Education (NCATE), for two-year or four-year institutions respectively. Several noted the major stumbling block, however, that these accrediting bodies require programs to be housed in departments or schools of education, and that ECE teacher preparation often occurs elsewhere.

Interviewees also emphasized that teacher preparation can only be as good as the teacher educators. Several identified the skills that they felt teacher educators should have, and noted that not all current faculty possessed them: for example, they thought that teacher educators should have a solid, current, and accurate ECE knowledge base; should have recent teaching experience in an ECE classroom; should be good teachers of adults; and should know the populations with whom the teacher candidates will work:

We have to face the fact that many of our teacher educators fall short of the task they face. They haven't been in classrooms with children in many years, and/or they have only worked with children from white, middle-class backgrounds. They may have read the latest science about brain development, but they have not necessarily rethought their approach in light of new information and new situations.

If you are good in the classroom with children, you are not necessarily a good teacher

³ One approach that many schools of education have adopted is to form partnerships with local public schools. The resultant "professional development schools" seek to develop stronger coherence between university coursework and student teaching experiences (Teitel, 2003). K-12 teachers and college faculty work together to craft and teach the courses that prospective teachers take, and fieldwork is designed to reflect the theoretical approaches taught in the classroom. Again, the quality of implementation makes a difference, such that research has generated mixed findings on whether teachers trained in professional development schools are better prepared. At least one set of reviewers suggests that such schools, when implemented well, yield evidence of "positive consequences for teacher preparation, veteran teacher learning, teaching practice, and student learning" (Darling-Hammond et al., 2005). In the ECE field, some experimentation with professional development schools is now taking place at the FPG Child Development Institute, University of North Carolina (Ritchie, Crawford, & Clifford, 2009).

educator. But you cannot be a teacher educator without classroom experience. Faculty should be required every five years to be engaged in a clinical setting to update their knowledge base and to refresh and build their skills. Would you want a surgeon who hadn't performed surgery for a long time teaching surgeons?

But even the best faculty members, they argued, can be constrained by limitations imposed on them by their institutions:

There are a couple of challenges that are bigger than individual faculty members themselves. In most community colleges, especially, the faculty have very heavy workloads. We're seeing some programs coming through for accreditation in which the full-time faculty member has an 18- to 24-credit course load per semester.

Teaching methods must also be modern and up-to-date. Several interviewees noted that students today are much more used to, and may even expect, courses using computer technology and online instructional techniques:

Teacher education programs have to think about how to teach the population they have now—students who don't know life without computers. The faculty need to be retooled.

While interviewees were not necessarily certain that on-line learning was as effective as traditional instructional techniques, they agreed that it was an important issue to explore and test.

K-12 and ECE Research

Despite continued debate over the value of schools of education and traditional teacher preparation routes, most K-12 teachers continue to be prepared via enrollment in and graduation from schools of education.⁴ As described above, however, our key informants did not

comment on that aspect of teacher preparation, but focused instead on the characteristics of the faculty in institutions of higher education; the extent to which teacher preparation includes fieldwork and/or mentors or coaches; and whether students progress through their coursework in cohorts or as individuals. Research confirms some of their conclusions about the promise of the cohort approach.

Some K-12 teacher education programs employ a cohort model, in which 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 (Agnew, Mertzman, Longwell-Grice, & Saffold, 2008). The benefits of such an approach are thought to include more active student participation, increased social and emotional support, and reduced attrition (Agnew et al., 2008). There is some evidence that candidates of color, in particular, benefit from cohort programs that have a focus on social justice and preparation for diversity (Cochran-Smith & Zeichner, 2005).

In the ECE context, the cohort model is increasingly being used as a way for working students to enter an AA or BA degree program and pursue much or all of their coursework together (Dukakis & Bellm, 2006). Such programs are often targeted to low-income ECE staff, and often offer a range of financial and academic support. The first-year report of "Learning Together," a longitudinal study of six BA cohort programs for adults working in ECE settings (Whitebook, Sakai, Kipnis, Almaraz, Suarez, & Bellm, 2008), suggests that the cohort approach, combined with targeted financial, academic and technological support, has enabled these working adults—nearly one-half of whom had previously tried unsuccessfully to complete a college degree—to enter upper-division degree programs and succeed. Future reports from this study will discuss graduation rates, which thus far appear to exceed the norm for working adult students, and will examine how teacher practices change over the course of completing a degree.

⁴ For discussion and reviews of the literature on whether or not teacher certification (often achieved by graduating from a school of education) is necessary, whether alternate certification routes are beneficial, and whether a four- or five-year school of education experience is preferable, see Cochran-Smith & Zeichner, 2005, and Boyd et al., 2007. For some of the stronger positions on the debate, see Podgursky, 2005, and Darling-Hammond, 2006.

A critical issue addressed in the Learning Together report is the ability of institutions of higher education to revamp their programs to meet the particular scheduling, financial and academic needs of adults currently employed in ECE settings. The report concludes that two elements are essential: a commitment to “nontraditional” students by key faculty and administrators, and sufficient funds to assist students with tuition and cover institutional costs related to offering targeted support. None of the six institutions being studied, however, expressed confidence in their ability to sustain such efforts without ongoing financial support from external public or private sources.

Recent surveys of institutions of higher education engaged in ECE teacher preparation confirm the issues raised by our key informants (Maxwell, Lim, & Early, 2006; Whitebook, Bellm, Lee, & Sakai, 2005). Nationally, most ECE teacher preparation occurs at community colleges, with limited programs at the four-year and graduate level. The ECE student population also tends to be far more diverse than the faculty; in California, for example, it is estimated that two-thirds of ECE students are people of color, yet about three-fourths of full-time ECE faculty are White, non-Hispanic (Whitebook, Bellm, Lee, & Sakai, 2005). Nearly one-third of faculty members in upper-division and graduate ECE teacher preparation programs have no experience working with children prior to Kindergarten, and many do not have specific academic preparation in early childhood education. Early childhood programs within institutions of higher education also employ fewer full-time faculty, and have higher faculty-to-student ratios, than other departments on their campuses. These conditions call out, at the very least, for additional resources, but also suggest that many teacher education programs are hampered in their ability to structure programs that reflect professional wisdom and research about high-quality teacher preparation (Lobman, Ryan & McLaughlin, 2005; Maxwell, Lim, & Early, 2006; Whitebook et al., 2005).

Yet since examinations of teacher education programs have fallen short in capturing the entire student experience in any given program, some have turned to a consideration of how the sum of the parts can create a whole. Darling-Hammond studied seven K-12 teacher

preparation programs that had been nominated as exemplary by key informants. While she did not conduct a systematic study of such programs (see Cochran-Smith & Zeichner, 2005, for a critique), she concluded that exemplary programs share seven core elements. These include some of the elements identified by our interviewees, as described above, as well as some elements not yet discussed (Darling-Hammond, 2006):

1. A common, clear vision of good teaching that creates a coherent set of learning experiences in both coursework and field placements;
2. Well-defined standards of professional practice and performance that are used to guide and evaluate coursework and clinical work;
3. A strong core curriculum taught in the context of practice, and grounded in knowledge of child and adolescent development and learning, social and cultural contexts, curriculum, assessment, and subject matter pedagogy;
4. Extended clinical experiences, carefully chosen to support the ideas presented in closely-connected coursework;
5. Extensive use of case methods, teacher research, performance assessments, and portfolio evaluation applying learning to real problems of practice;
6. Explicit strategies to help students confront their own deep-seated beliefs and assumptions about learning and students, and learn about the experiences of people different from themselves; and
7. Strong relationships, common knowledge, and shared beliefs among school- and university-based faculty jointly engaged in transforming teaching, schooling, and teacher education.

Together, these elements suggest aspects of teacher preparation for both K-12 and ECE research to explore in the future.

Summary of Findings on Hypothesis 1

Our interpretation of the research literature and of clinical wisdom in the field is the following:

- 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 that promotes children's learning.

- 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 experiences, 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 appears 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.

After initial preparation, teachers continue to expand their knowledge and hone their skills 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).

In K-12, the value of ongoing learning is taken as a given, as evidenced by robust continuing education and training programs for teachers. *Induction programs* that support teachers in their first years on the job, as well as systems of ongoing *professional development* throughout their careers, are widespread in public school systems, and funding is routinely earmarked for them. A frequent element of both induction and professional development is the use of a *coach* or *mentor* who can work with the individual teacher to model teaching practices, observe the teacher in the classroom, and provide feedback and opportunities for reflection.

By contrast, induction programs are rarely available to the ECE workforce, except for preschool teachers who are part of a public school system and whose preparation mirrors that of K-12 teachers. In ECE, a working teacher's first professional development experience, no matter what it is called, may simultaneously be her first field placement, a kind of induction or orientation, and a professional development experience with a mentor. The very term "professional development," in fact, carries quite different meanings in the two fields, as discussed below.

Induction

The transition into the teaching workforce can be a time of special, or even overwhelming, vulnerability for novice practitioners. Induction programs are designed to ease this transition, typically by pairing a new teacher with an experienced mentor.

K-12 and ECE Research

While most K-12 school districts deliver induction services to new teachers, these programs can vary in important ways, as described in a review by Ingersoll and Kralik (2004):

- *Duration and intensity*: ranging from a single meeting to frequent sessions over several years between mentors and protégés;
- *Population served*: only those who are new to teaching, vs. any teacher, experienced or not, who is new to a given school;
- *Purpose*: to foster the professional growth of novice teachers, vs. to assess new teachers and possibly weed out those who are ill-suited to the work;
- *Selection of mentors*: mentors can be trained or untrained, paid or unpaid; some volunteer to be mentors, while others are required to participate; and some programs match mentors and protégés, while others do not.

Several research reviews concerning K-12 induction programs have concluded that mentoring is correlated with higher retention of new teachers in the profession, and perhaps with decreased turnover from district to district and school to school; that comprehensive induction programs are more likely to decrease turnover than those of less intensity; and that such comprehensive programs are a sound fiscal investment for the new teacher, the district, the state, and society (Ingersoll & Kralik, 2004; Strong, 2005; Villar & Strong, 2007). Some reviewers recommend that, for new teachers, mentoring continue for at least the first two years of service (National Partnership for Teaching in At-Risk Schools, 2005). The research studies included in these reviews, however, suffer from certain methodological limitations—including, often, the lack of a compelling comparison group. As a result, other reviewers have been more cautious, concluding that research has not clearly identified the precise program elements of an effective, comprehensive induction program.

The most rigorous test of K-12 induction programs to date, a federally funded randomized trial, compared a comprehensive induction program with the more typical programs available in 17 school districts. In that study, comprehensive programs were defined as

involving “carefully selected and trained full-time mentors; a curriculum of intensive and structured support for beginning teachers that includes an orientation, professional development opportunities, and weekly meetings with mentors; a focus on instruction, with opportunities for novice teachers to observe experienced teachers; formative assessment tools that permit evaluation of practice on an ongoing basis and require observations and constructive feedback; and outreach to district and school-based administrators to educate them about program goals and to garner their systemic support for the program” (Glazerman, Dolfin, Bleeker, Johnson, Isenberg, et al., 2008, p. viii).

After one year, results showed no differences between treatment and control groups in teacher classroom practices (i.e., lesson implementation, lesson content, and classroom culture); student reading or math test scores; teacher retention (at the original school, within the district, or in the teaching profession); or teachers’ feelings of readiness for or satisfaction with their jobs (Glazerman et al., 2008). It is possible that teachers need more than a one-year experience in order to realize the potential of induction programs; it may also be that, like teachers in the comprehensive program, teachers in the more typical programs also received some benefit, accounting for the absence of differences between the two groups. The evaluators plan to continue induction services and to follow teachers for another year to see whether the findings change. Still, these results suggest that research has not yet identified clearly the precise elements that should be included in a comprehensive induction program or in the training and preparation of mentors, and a recent review has concluded that more rigorous studies on induction are needed (Wei, Darling-Hammond, Andree, Richardson, & Orphanos, 2009).

In ECE, because induction programs *per se* are such a rarity, there is no specific research on this topic; some work has been done, however, to examine ECE mentoring/coaching programs, discussed below in “Professional Development.”

Professional Development

As discussed in Part I of this two-part paper, “Teacher

Preparation and Professional Development in Grades K-12 and in Early Care and Education: Differences and Similarities, and Implications for Research,” “professional development” in K-12 is a routine, relatively well-funded, core activity of every school district, delivered to teachers who have begun with at least the baseline of a bachelor’s degree, and is used to denote the ongoing education and training of working teachers. In ECE, “professional development” is a catchall term used to describe a much broader range of training and education activities—and in many cases, when a higher education degree is not required, it can account for most or all of a teacher’s preparation.

We use the term “professional development” as it is used in K-12—to refer only to training or education undertaken by those already working as teachers. But it is important to recognize that this term means something very different when it is offered to teachers working from a shared baseline of a BA degree plus certification, vs. when it is offered to a workforce with widely varied levels of education.

Nevertheless, given these differences, there are some commonalities between what research has found in these two fields about the value, or potential value, of mentoring and other forms of professional development for working teachers.

K-12 Research

Professional development in K-12 takes the form of training or courses designed to help individual teachers build their skills and meet their career needs, or it can involve the training of teams of teachers within a school or district aimed at improving instruction more broadly, perhaps as part of school reform efforts (Miles, Odden, Fermanich, & Archibald, 2005). Ongoing professional development is typically provided by school districts, unions, institutions of higher education, or other organizations.

Recent reviews of K-12 professional development efforts caution that many such programs are of little benefit, but that those that appear to produce benefits in teaching practices and student outcomes have at least three characteristics (Hill, 2007; Loeb, Rouse, &

Shorris, 2007; Wei et al., 2009):

- Substantial time commitment is required (e.g., at least a two- to four-week summer program). One-day workshops are not worthwhile.
- Programs are targeted and directly linked to teachers' instructional practice (e.g., specific content knowledge, subject matter-specific instruction, or student learning).
- The professional development is linked to the instructional goals and curriculum materials of the district or school.

Specific strategies that are thought to be effective include using extended workshops; collaborative lesson study in which teachers work together to create a lesson plan, teach it, and observe and critique its delivery; and mentoring (Hill, 2007).

ECE Research

Among ECE teachers, professional development serves as a way to equalize knowledge and skills across a workforce that has entered teaching without a common foundation of pre-service preparation. Teachers undertake professional development to increase their teaching skills, to build their knowledge of a particular subject area, to learn to implement a specific curriculum—and/or even to achieve a degree. ECE research has suggested that professional development can be helpful in improving program quality (e.g., Galinsky, Howes, & Kontos, 1995), but some argue that, in general, studies have not conclusively demonstrated benefits in terms of positive child outcomes (e.g., Ramey & Ramey, 2008).

Ackerman (2008) examined the effectiveness of 18 coaches employed to help different centers seeking to improve their scores on their state's Quality Rating Scale. This exploratory survey suggested the complexity of skills required for acting as a "change agent," who may face such issues as a lack of leadership or engagement in the change process, teachers' mistrust, or personal problems of teachers that impact their effectiveness. These issues have also been identified in studies of coaching in early childhood special education (Buisse & Wesley, 2005; Rust, Ely, Krasnow, & Miller, 2001).

In recent years, the federal government has sponsored rigorous randomized trials in preschool classrooms to test the effectiveness of specific curricula in improving teachers' instructional practices, program quality, and/or child outcomes. In these studies, professional development typically consisted of an initial workshop, plus some additional sessions to help teachers learn to implement a curriculum; the use of a coach or mentor to help reinforce the lessons; and opportunities for reflection, usually with the coach, but also sometimes with peers. (For a review of the professional development aspects of the studies, see Klein & Gomby, 2008.)

Some of these studies may provide insight into the effectiveness of various professional development strategies, because the effects of different strategies were measured separately from the effects of the curriculum that was their subject (Assel, Landry, Swank, & Gunnewig, 2006; Lonigan, Farver, Clancy-Menchetti, & Phillips, 2005; Pianta, Mashburn, Downer, Hamre, & Justice, 2008; Ramey & Ramey, 2008).

Assel and others (2006) tested mentoring versus non-mentoring approaches with two curricula in three different types of ECE settings. Studies by Pianta and his colleagues (2008) tested for any additional advantage when online access to instructional materials was coupled with feedback from an online coach. Lonigan and others (2005) tested for effects on children when their teachers learned to implement the Literacy Express curriculum in workshops, vs. in workshops with assistance from mentors. Ramey and Ramey (2008) compared the effects of weekly and monthly coaching in classrooms implementing the Building Language for Literacy curriculum.

In these studies, the specific benefits of coaching or mentoring varied, depending on the child outcomes assessed (Lonigan et al., 2005), the curricula being implemented (Assel et al., 2006), and the auspices of the ECE program in which the coaching or mentoring was delivered (Assel et al., 2006). For example, Lonigan and others (2005) found that coaching of teachers resulted in gains in children's print knowledge, but not in their oral language, phonological processing, or cognition. On a measure of phonological awareness, Assel and

others (2006) found that children in Head Start did better in non-mentored than in mentored classrooms, no matter the curriculum being implemented, but children in Title I-funded and other publicly funded preschool settings did better in mentored than in non-mentored classrooms. Further, more intensive coaching (e.g., weekly vs. monthly) did not always yield more change in teacher behavior (Ramey & Ramey, 2008).

In another study that can provide some important insight into how coaching programs operate, Ryan, Hornbeck, and Frede (2004) examined how mentors or coaches spent their time as they worked with teachers in New Jersey's publicly funded Abbott Preschool Program. They concluded that mentors or coaches who had more specific early childhood-related training, and clearer definitions of their roles and responsibilities, were more effective with teachers.

These five studies therefore suggest two main findings:

- Professional development that involves coaching leads to more changes in teacher behavior than programs implemented without coaching (Pianta et al., 2008; Ramey & Ramey, 2008).
- While much remains to be learned about the specific benefits of coaching and mentoring and about the important factors that influence its effectiveness, at least one such factor appears to be the training and clarity of roles and responsibilities of the coaches or mentors themselves (Ryan et al., 2004).

Peer Relationships

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 far less common in K-12 than in ECE, where a team approach frequently occurs in classrooms and centers. While co-teachers in ECE may have different titles, such as teacher, assistant teacher, or aide, there are often minimal differences between them in actual professional preparation and education.

K-12 and ECE Research

At all levels of teacher preparation, the research literature on peer relationships—in particular, the notion of teachers helping each other strengthen their practice—is quite limited. Because K-12 teachers are often alone in their classrooms, they typically have few opportunities to interact with peers on substantive matters related to instruction. Some of the professional development literature, however, suggests that a particularly effective approach is for groups of teachers or an entire school to work together to achieve an academic goal or to embrace and implement a new curriculum. Such teacher learning communities can include strategies such as peer observations of practice, analysis of student work and student data to suggest areas of focus for the teachers, and study groups (Wei et al., 2009). Even in ECE, despite the prevalence of co-teaching in that field, few studies have explored the effects of peer relationships in the classroom (Whitebook, Sakai, Gerber, & Howes, 2001).

Summary of Findings on Hypothesis 2

Our interpretation of the research literature in the field is the following:

- 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 workplace conditions do not support them. Teachers may not be able to apply the instructional approaches they have learned if different methods are predominant at their workplace. Their performance may suffer, and they may leave the workplace or the field altogether, if wages and benefits are too low, if the program's director or principal is unsupportive, if there is high turnover among other teaching staff, or if the workplace is unsafe or lacking in essential equipment.

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

ECE research has investigated a more limited set of workplace characteristics. These include some of the same characteristics as studied in K-12, such as adult-child ratios and group sizes, staff compensation (wages/benefits), the effects of peers (other teachers in the ECE program), and the administrative and leadership climate of the ECE program. But 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.

Here, in summarizing the K-12 and ECE literature on how workplace characteristics impact teacher effectiveness, we focus on five aspects of the teaching work environment:

1. Group size and adult-child ratios;
2. Compensation;
3. Unionization;
4. Teacher retention and turnover; and
5. Administrative leadership by directors and principals.

Group Size and Adult-Child Ratios

Research in both K-12 and ECE suggests that group size and ratios affect teacher behavior and effectiveness, as well as program quality. When class or group sizes are too large, or adult-child ratios too high, teachers are less able to provide individualized instruction to students or to manage children with behavior problems, which can cause disruptions for all students in the classroom.⁵

The two fields are not identical, however, in defining group size and ratios. In Grades K-12, unlike ECE, the classroom environment typically includes a single teacher with no assistant or aide, so that class size is often equivalent to group size. Adult-child ratios are rarely calculated or reported at the classroom level in K-12; instead, such calculations are often reported at the level of the entire school, and include all licensed educators in the facility, including counselors, librarians, and resource teachers (Murnane & Steele, 2007).

K-12 Research

California, Tennessee, and Wisconsin are among the states that have instituted class size reduction efforts and then tested for improvements in children's school achievement. For a review of several studies related to class size, see Biddle and Berliner (2002). Results of these efforts suggest the following:

- Smaller class sizes (about 15 children per teacher) are beneficial. Children in such classes show improvements in reading and mathematics scores, with some studies suggesting that the benefits may

⁵ "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.

be greater for math than for reading or language arts (Webb, Meyer, Gamoran, & Fu, 2004).

- The largest benefits appear to accrue in the early grades (K-3). Small classes in the first grade may be particularly important (Webb et al., 2004).
- Disadvantaged children seem to benefit more from class-size reduction, which may mean that such efforts can narrow achievement gaps, although some recent analyses of Tennessee data suggest that this is not always the case (Jacobson, 2008).
- Class-size reduction can be ineffective if not implemented well. In California, an under-funded plan meant that many low-income schools found themselves having to make do with inexperienced teachers and inadequate classroom spaces, resulting in minimal benefits for children (King, 2006).

ECE Research

Several studies of quality in ECE centers have found associations between adult-child ratios and program quality (Helburn, 1995), more positive caregiving, at least through 36 months of age (National Institute of Child Health and Human Development [NICHD], 2002), and better language comprehension and school readiness, and fewer behavior problems, among children through 36 months of age (NICHD, 2002).

Smaller group sizes and lower adult-child ratios have also been associated with better quality in a range of early childhood programs (Frede et al., 2007; Gormley et al., 2004; Karoly et al., 2008; NICHD, 2002; Reynolds, 1997).

Compensation

Starting salaries for teachers in K-12 education are lower than those of such other professionals as computer programmers, accountants, and registered nurses, and with tenure, the gap between teaching and these other professions widens (National Association of Colleges and Employers, 2008). But in early care and education, teacher salaries are substantially lower than in K-12.

While a starting elementary school teacher earns only two-thirds the salary of a registered nurse, for example, a preschool teacher in a private setting, with comparable education, is likely to earn one-third to one-half less than her K-12 counterpart (e.g., see the California

ECE workforce study by Whitebook, Sakai, Kipnis, Lee, Bellm, Almaraz, & Tran, 2006). Largely because of the influence of teachers' unions, public schools in Grades K-12 offer uniform pay scales, typically subject to collective bargaining, that detail benefits, raises, and rewards linked to a teacher's educational level, continuing education, and tenure. Discussions of merit pay, through which teachers earn a differential based on performance, are on the rise in many states and school districts.

K-12 Research

Teacher salaries exercise a strong influence on college graduates' decisions on whether or not to enter teaching, and they contribute to teachers' decisions to remain in the field or to leave (Murnane & Steele, 2007). Some researchers have attempted to quantify the effect of wages on teacher retention, suggesting that increasing pay by one percent decreases the probability of teacher departure by 2.1 percent, although other working conditions, such as class size and student characteristics, moderate the relationship between teacher pay and attrition (Strong, 2005).

At least one recent review found little evidence that more highly paid teachers are more effective, but the authors concluded that methodological problems may have limited the conclusions that can be drawn from the studies reviewed (Hanushek & Rivkin, 2007).

Researchers note that only a few school districts base teacher salaries on classroom performance, perhaps in part because it is difficult to do so without creating undesirable incentives, such as motivating teachers to "teach to the test," or to change student test scores so that their teaching will appear more effective (Loeb, Rouse, & Shorris, 2007).

ECE Research

ECE research has found fairly consistently that centers paying higher wages or offering cash incentives are better able to retain teachers and directors (Gable, Rothrauff, Thornburg, & Mauzy, 2007; Whitebook, Sakai, Gerber, & Howes, 2001); that teachers with higher salaries and better health care benefits tend to work in

centers with higher-quality environments for children (Whitebook, Howes, & Phillips, 1998); and that higher wages are associated with greater overall program stability, and fewer center closures (Kershaw, Forer, & Goelman, 2005).

Unionization

A key difference between K-12 and ECE systems is the extent to which these teacher workforces are unionized. All 50 states have teachers' unions and tenure laws, and 35 states and the District of Columbia have laws guaranteeing collective bargaining rights for teachers (Loeb, Rouse, & Shorris, 2007). In contrast, there are no current national data on the percentage of center teachers who work under a collective bargaining agreement, but this number has historically been very low; in 1988, fewer than five percent of the child care workers in five major U.S. metropolitan areas were unionized (Whitebook, Howes, & Phillips, 1990). Since that time, the majority of union organizing in ECE has occurred among home-based providers (Chalfie, Blank, & Entmacher, 2007), with little if any increase in representation of center-based teachers, except for those in public school-based, publicly funded preschools, who in most states would be eligible for union membership.

K-12 and ECE Research

The K-12 research literature indicates that unionization increases teacher pay and benefits; the higher the share of unionized teachers in a state, the larger the gap in wages between new and experienced teachers. On average, collective bargaining obligations increase states' education spending by about 15 percent (Loeb, Rouse, & Shorris, 2007). This research, however, has not been linked directly to teacher practices.

In the 1988 ECE study cited above, unionized teachers earned higher wages, had more ECE credits, participated in more hours of in-service training, and worked at centers with lower turnover (Whitebook et al., 1990). Our literature review produced only one item in a peer-reviewed journal on unions and child care workers, an exploratory study of the impact of unionization on a small sample of centers in Seattle (Brooks, 2003). The 12 teachers interviewed for the study reported that

they believed unionization and/or union lobbying had improved several aspects of their work environments.

Teacher Retention and Turnover

The K-12 and ECE communities share concerns about retaining teachers, but the extent of the problem differs between the two fields. Turnover is potentially negative for children for at least two reasons: (1) if it results in a relatively inexperienced or unskilled teacher taking the place of a more experienced or skilled teacher; and (2) if the emotional attachment that children have formed with their teacher is disrupted, an issue of particular concern for young children because of the critical importance in the early learning years of establishing attachment and trust (National Scientific Council on the Developing Child, 2004).

In K-12 research or data collection other than that conducted by the Department of Labor, teacher turnover can refer to the percentage of teachers who change particular teaching assignments within a school, change schools, or leave the profession altogether (Strong, 2005). In ECE, no routinely collected data sets provide equivalent information across the whole field, although occasional or periodic studies of ECE settings report the percentage of teachers who have left their programs in the last twelve months, and some workforce studies include data on teacher tenure.

K-12 Research

Teacher turnover is the largest single determinant of demand for new K-12 teachers. Each year about six percent leave teaching altogether, 17 percent change assignments within schools, and seven percent move to another school (Cochran-Smith & Zeichner, 2005). The highest rates of departure from teaching altogether occur among the youngest and oldest teachers. About 50 percent of new teachers leave teaching by the end of five years (*American Educator*, 2006).

Some studies have suggested that K-12 teachers who begin teaching without professional training (i.e., through an alternative route) are twice as likely to leave teaching in their first year as those who have had student teaching and preparation in such areas as learning

theory, child development, and curriculum (Boe, Cook & Sunderland, 2006; Henke, Chen, & Geis, 2000; Luczak, 2004, as cited in Darling-Hammond et al., 2006; National Commission on Teaching and America's Future, 2003), but one comprehensive review of the field concludes only that studies comparing the attrition rates of teachers prepared through alternative vs. traditional routes have yielded mixed, inconclusive results (Cochran-Smith & Zeichner, 2005). Research has not resolved the debate regarding the value of traditional K-12 teacher preparation approaches, but there may be emerging similarities with ECE, in that some K-12 researchers are now urging greater exploration of content and approaches employed in teacher education programs (Darling-Hammond et al., 2006).

ECE Research

Teacher turnover is typically much higher in ECE than in K-12, with teachers frequently moving to other settings within the field, to public schools, or outside the field altogether. In contrast with K-12, however, ECE turnover data are generally derived from studies of individual programs, rather than tracked uniformly across a district or larger area, since most ECE programs, after all, are not arranged into districts. Because turnover in any industry is associated with challenges to teamwork and quality, high levels of turnover are considered an indicator of poor working conditions that affect employee performance (Whitebook & Bellm, 1999). Turnover is viewed as especially problematic in early childhood settings, since the disruption of adult-child relationships can undermine young children's particular needs to form bonds of attachment and trust (National Scientific Council on the Developing Child, 2004).

ECE research regularly conceptualizes turnover as a marker for overall program quality, and some studies have associated higher levels of turnover, and lower teacher and director wages, with lower classroom quality and poorer child outcomes (Helburn, 1995; Whitebook, Howes, & Phillips, 1998; Whitebook, Sakai, Gerber, & Howes, 2001). Whitebook and her colleagues (2001) found that highly trained ECE teachers were more likely to leave their centers if many other highly trained teachers had also left, and if they worked with a greater percentage of teachers without BA degrees.

The authors concluded that the absence of capable co-workers makes a difficult job significantly more difficult. Several studies have demonstrated a strong correlation between high turnover and low compensation (Helburn, 1995; Mill & Romano-White, 1999; Whitebook, Howes, & Phillips, 1998; Whitebook & Sakai, 2003). No ECE research, however, has yet looked at the effects of teacher preparation on teacher retention.

Administrative Leadership by Directors and Principals

Since center directors and school principals can create environments that encourage peer learning and reflection among teachers, or not, administrative leadership is of critical importance in ECE centers and schools.

Principals and center directors serve somewhat similar roles in K-12 and ECE. They set the tone with respect to expectations for teachers, students, and parents. They establish budgetary priorities, and hire and fire staff. They approve professional development opportunities, and provide flexibility in hours to enable teachers to participate in them. And they can help create an atmosphere in schools and centers that encourages teachers to work collaboratively to improve their skills and share what they have learned (Bloom & Sheerer, 1992; Helburn, 1995; Whitebook, Ryan, Kipnis, & Sakai, 2008).

Administrators, of course, must also meet the requirements and regulations that govern their systems and funding streams, and these may substantially limit their autonomy in decision-making. School principals operate within districts that may set policy on curricula to be used, professional development to be offered, or academic goals. The federal No Child Left Behind Act drives much of the decision-making in schools and school districts today. Further, principals may find some of their ability to make personnel decisions about individual teachers limited by collective bargaining agreements with teachers' unions. But while ECE center directors—especially if they are not part of school-based preschool systems or national systems such as Head Start—may have more autonomy than K-12 principals with respect to such decision-making, they often do not have the dedicated funding available

in larger systems for staff professional development.

Research on ECE administrators is less extensive than that on teachers. Nevertheless, results to date suggest that these leaders exert important influences on teacher effectiveness and program quality, which has led to public policies and program initiatives in both arenas to bolster the skills of directors and principals, including a director mentor effort within the California Early Childhood Mentor Program, and the McCormick-Tribune Center for Early Childhood Leadership (Teitel, 2003).

K-12 Research on Principals

The research literature on principals in K-12 is very large, and we did not explore it thoroughly. Reviews do note, however, that an absence of strong leadership is often associated with a host of factors that make for ineffective schools and teachers. A policy brief on induction programs, for example, concluded that these can only succeed if strong principal leadership is in place (Alliance for Excellent Education, 2004). A review focusing on best ways to prepare teachers to work in at-risk schools concluded that high-poverty and high-minority schools tend to face a host of concurrent factors: they are more likely to be dangerous, overcrowded, and poorly maintained; to have high rates of staff and student turnover and absenteeism; to offer a less conducive learning environment than other schools; and to have weak leadership (National Partnership for Teaching in At-Risk Schools, 2005).

According to a meta-analysis comparing the effects of various principal leadership styles and practices on student outcomes, the one most strongly associated with positive student outcomes was that of promoting and participating in teacher learning and development—but as the authors pointed out, further research is needed to understand more specifically how principals can influence the teaching practices that matter (Robinson, Lloyd, & Rowe, 2008).

ECE Research on Center Directors

The ECE literature on the effects of center administra-

tors on center quality and teacher behavior is limited, but such research has sought to link demographic characteristics (e.g., educational level or experience) with overall center quality, or to link turnover of center directors with program quality and/or teacher behavior.

For example, one study of a sample of California child care centers, in which director turnover averaged 40 to 50 percent from 1994 to 2000, found that centers that lost directors had higher levels of teacher turnover than those with consistent management over time. Further, in programs that had lost directors, teaching staff were rated as harsher toward the children in their care (Whitebook et al., 2001). A Canadian study that examined factors associated with teachers' warmth and anger in the classroom found that those with higher anger scores had fewer job rewards, more job concerns, and, most importantly, less support from supervisors (Mill & Romano-White, 1999).⁶

A study of teacher qualifications and behavior in 231 center classrooms also offered suggestive evidence that director qualifications influence teacher qualifications and global classroom quality (Vu et al., 2008). In that study, if teachers held a California Child Development Permit, then their scores on measures of instructional behaviors and interactions with students improved with an increase in the director's permit level. Further, teachers with BA degrees working in centers whose directors held MA degrees or more scored higher on teacher interaction, as measured by the CLASS, than teachers with similar education and less well-educated directors. A separate study of 80 ethnically diverse ECE teachers, 80 percent of whom had no pre-service education before they began teaching, showed that (after controlling for education level) teachers who demonstrated the most responsive involvement with the children in their care, who engaged children in language play most often, and who provided the most language arts activities, experienced, among other things, better supervision from a director or mentor (Howes, James, & Ritchie, 2003). Finally, a study of 30 North Carolina centers showed that those with more positive organizational climates had higher global quality scores, and that those whose directors had com-

⁶ Note: The study report does not indicate whether or not these supervisors were center directors.

pleted four-year degrees and certification were rated as having more positive organizational climates (Lower & Cassidy, 2007).

Summary of Findings on Hypothesis 3

Our interpretation of the research literature in the field is the following:

- 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 both 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

Whether in early care and education (ECE) or in Grades K-12, teachers play a central role in children's learning and development—and it goes without saying that this role should be an effective and positive one. At all levels of education, policy makers and practitioners want to understand how to prepare teachers most effectively to have a positive impact on children's lives, and how to help them improve their skills and practice throughout their careers. For the best available evidence to inform policy and practice, they look to research on teacher education.

As we described in Part I of this two-part report, structural differences between ECE and K-12 in terms of teacher preparation, professional development, regulation, work environments, and data collection have led researchers in the two arenas to explore somewhat differently the issues of effective teacher preparation, teacher performance, and teacher quality. But both fields increasingly recognize the need for a more multi-faceted research agenda that can inform policy to transform the teaching profession. America's standing as a world leader in education has fallen considerably in recent decades, and the Obama administration and others have signaled that restoring America to a strong leadership role through a sustained public investment in education is essential to our future (Heckman & Masterov, 2007; Obama & Biden, 2009).

In this second part of the report, we reviewed existing knowledge about preparation and support for teachers at both levels of education. We focused on both K-12 and ECE out of a conviction that lessons from one field can inform practice in the other. Further, we posited, and organized our review around, three hypotheses that we believe are centrally important for understanding teacher preparation and performance in the two fields:

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

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.

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

Together, these 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—improving and strengthening pre-service training and preparation, opportunities for ongoing professional development, and work environments—is the best way to influence teacher performance, quality, and effectiveness.

Indeed, we believe that the existing research has yielded conflicting or inconclusive answers on some questions—e.g., Do ECE teachers with a BA outperform teachers without a BA? Do K-12 teachers who enter via a traditional certification path outperform those who take an alternative route?—partly because it has not considered all three of these elements simultaneously, or with sufficient depth and specificity. One cannot expect a clear answer to the question about BA degrees for early childhood educators if research does not consider the content, design, and delivery of the BA program; the extent to which staff receive ongoing, high-quality professional development once they are in the workforce; and the extent to which their workplaces support them in putting into practice what they have learned.

Our review of the K-12 and ECE literature generally supports each of our hypotheses, and based on both the literature and professional wisdom in the field, we offer here 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.

This is especially important, we believe, as policy and practice bring the worlds of ECE and K-12 closer together. More and more ECE teachers, for example, may find themselves working in public school systems and having to meet the same expectations as other teachers in those systems, and K-12 teachers will increasingly rely on ECE as the vehicle for ensuring that children are well prepared for success in elementary school.

(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—namely, 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.

Such a data system would be enormously useful for planning and evaluation at the state and local levels, and for conducting point-in-time and longitudinal research. The system could also contain information about teachers’ backgrounds and preparation, their professional development opportunities, their wages and benefits, and the ongoing supports they receive. To give but one example of the usefulness for policy of such an infrastructure investment: without such data, there is currently no way to answer basic questions about the readiness of the existing ECE workforce to fulfill the teaching roles required in any proposed expansion of publicly funded preschool programs.

Constructing the database will also require decisions about the data elements to be included, and the extent to which information about teachers could or should be linked to information about their workplaces and the outcomes of children in their care. U.S. Secretary of Education Arne Duncan has urged that state and district education data systems include teacher and student data (McNeil, 2009). In K-12 research, child outcomes are largely defined in terms of performance on state-mandated standardized tests, but in ECE, there is no consensus about how best to assess young children. Public and private funders could work together to build consensus in the field concerning the structure, definition, and eventual purposes of an ECE workforce database.

Part of this infrastructure investment should involve attention to integrating and coordinating all federally supported ECE research efforts, which now are housed in different departments and sub-agencies.

(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. For ECE, one approach would be to fund the Early Childhood Professional Development Program, housed in the U.S. Department of Education, to expand longitudinal, observational, and experimental research focused on identifying strategies that prepare and support teachers most effectively.

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.

In order to truly assess the effectiveness of ECE teacher preparation through a college or university degree program, it is essential for research to examine the content and delivery of such programs. For example: What is the nature and content of the coursework? What types of fieldwork, and of what duration, are students engaged in? Who are the teacher educators, and what is their own professional preparation? Is the program accessible for working ECE teachers who are seeking to advance their education?

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*, along the lines of those identified by Darling-Hammond (2006) for K-12 teachers. 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, and when it occurs in one's career, as well as the professional preparation of fieldwork instructors and supervisors; and

- 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.

There is little question of the importance of ongoing professional development for teachers throughout their careers, but there remains a great deal to learn about which approaches work best with different teachers, and which ones contribute to short- and long-term change in teacher practices that benefit children's learning and development.

In the area of professional development for ECE teachers, 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, which are often combined into a single professional development program, as well as 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 gain a greater understanding of 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/mentoring 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.

Because growth and learning are career-long processes for a teacher, the work environment must be a supportive place that creates time and opportunity for teachers to reflect upon their work. The worksite should facilitate professional development opportunities that emerge from what teachers are trying to accomplish. And the worksite needs sufficient resources to retain well-trained staff and limit turnover.

We examined research on five aspects of the teaching work environment: group size and adult-child ratios; compensation; unionization; teacher retention and turnover; and administrative leadership by directors and principals. To increase our knowledge of what it takes to support and nurture effective teachers, we recommend a research agenda focused on understanding the necessary workplace conditions that allow teachers to thrive.

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. By including information about these issues, researchers can begin to build a more robust knowledge base about such variables, and about which of them are most salient with regard to teacher practice.

(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 (such as mentors, directors' groups, and ongoing professional development).

Implications for Public Policy: Two Final Recommendations

This two-part paper has reviewed the current state of knowledge about effective ECE teacher preparation, and has sought to identify gaps between this research knowledge and the ongoing questions of policy and practice in the field. Through a cross-system exploration of the worlds of ECE and K-12 education, we have charted the salient differences between these two worlds, and compared their research literatures on teacher preparation, but we have also uncovered similar questions and concerns, and, we hope, opened some avenues for joint research efforts in the future.

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, as well as 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—whatever their level of preparation and professional development—from doing the best they can.

These include limited opportunities to pursue higher education for a degree while already working as teachers; poor levels of compensation that discourage many who have invested in their education from remaining in the field, fueling high rates of turnover among staff as well as disruption for young children; and professional development programs that are too often superficial, short-term, or disconnected from opportunities for teachers to reflect on what they have learned, discuss it with others, and apply it to daily practice.

There is already a wealth of evidence that early care and education teachers need more support on the job and in their educational pursuits. 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. All levels of American education are in need of reform, and 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-shot 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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APPENDIX

Methods

The findings contained in this article come from a combination of interviews with key informants and a review of the research literature on teacher preparation in the early care and education (ECE) and K-12 fields.

Key Informant Interviews

We interviewed 22 individuals (six of these through e-mail exchanges) with expertise related to teacher preparation, primarily from the early care and education and/or elementary education fields. The purpose of these contacts was to solicit professional wisdom on the subject of teacher education that might not yet have been addressed in the research literature but that might nevertheless be useful in informing a research agenda for the coming years.

We developed an initial list of potential contacts, vetted the list with colleagues who suggested additions and changes, and eventually contacted experts from the following arenas: teacher educators in institutions of higher education and/or community agencies ($n=9$), funders with an interest in studying and promoting teacher effectiveness ($n=2$), program administrators working with teachers ($n=4$), those engaged in policy or program administration related to teacher preparation ($n=3$), and researchers focused on teacher education and/or early care and development ($n=4$). Of the 22 experts consulted, ten were people of color, and two were male; all others were white, non-Hispanic women.

To solicit the views of current ECE teachers, we also engaged in conversations with an additional ten teachers participating in a ten-week course designed as a prerequisite for becoming a mentor teacher. Two of the ten course sessions directly focused on the elements of effective teacher preparation, and the issue of effective preparation was a theme throughout the class. The teachers' experience ranged from three to 22 years working directly in programs for infants, toddlers, and preschoolers, and their educational backgrounds ranged from 40 ECE-related college credits to a doctorate in child development. Five of the teachers were

women of color, and the remaining participants were White, non-Hispanic; one teacher was male. All interviews and contacts occurred between October 2007 and June 2008, and were 40 to 75 minutes in length.

Our interview protocol was approved by the Committee for the Protection of Human Subjects at the University of California at Berkeley. All individuals whom we approached agreed to be interviewed. Interviews were tape recorded, and employed open-ended questions concerning four issues:

- Key elements of good ECE teacher preparation both, for entry-level teachers and those already working the field, including perspectives on program content and applied experiences, such as a fieldwork placement or practicum;
- Best methods for influencing the practice of teachers who are working in the field with limited pre-service or in-service preparation;
- Innovative, successful strategies to expand ECE teacher preparation to ensure access to education for teachers from diverse backgrounds; and
- Suggestions for a research and policy agenda (including methods and design) concerning effective teacher preparation.

Data analysis of the interviews consisted of: (1) inductively coding all questions to identify recurring topics raised by participants; (2) a review of subject responses by team members to identify subcategories of themes by topic; and (3) agreement by the authors on the representative quotations to be included in this report.

Literature Review

Our literature review drew on findings concerning several topics in the ECE and K-12 research literature:

- Teacher quality and effectiveness;
- Schools of education, teacher preparation, and professional development;
- The workplace context; and
- The relationship of these factors to teacher behavior and instructional practice, and to student performance.

Each of these topics has a very broad research litera-

ture, and so we relied on several recent reviews of the various literatures as starting points. 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). We also reviewed key studies referenced in these reviews, and further complemented the reviews by searching online databases (APA Online, using such keywords as “professional development,” “teacher preparation,” “retention AND teachers,” “teachers AND peer learning,” “reflective supervision AND teachers,” and “teachers AND work environment AND school environment”) and selected journals (*Early Childhood Research Quarterly*, *Journal of Teacher Education*, *Teachers College Record*,

Teaching and Teacher Education, and *Young Children*) for the years 1998-2008. In addition, we reviewed several key websites (Education Commission of the States, Institute of Education Sciences, National Center for Analysis of Longitudinal Data in Education Research, and Urban Institute) to locate relevant unpublished studies.

Our searches identified hundreds of studies, articles, and books. We focused primarily on those that we judged to be the most rigorous methodologically, or that appeared to be seminal studies or policy reviews as judged by the frequency with which others referenced them. Given the scope of this article and the breadth of the literature, we cannot summarize adequately in this paper all the nuances and findings of all the work that we reviewed, but we believe that we have captured the major trends and points of discussion within each of these disparate literatures.