

**Ensuring Effective Teaching in Early Childhood Education through Linked Professional Development Systems, Quality Rating Systems and State Competencies:
The Role of Research in an Evidence-Driven System**

A National Center for Research in Early Childhood Education White Paper

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This paper was produced as a consequence of the National Center for Research on Early Childhood Education 2008 Leadership Symposium, held on February 5th, 2008, in Arlington, VA. We cannot name all the symposium participants here but rather want to acknowledge their participation and commitment to the discussion and to this initiative for evidence-driven improvements in early childhood education. The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305A060021 to the University of Virginia. The opinions expressed are those of the authors and do not represent views of the U.S. Department of Education.

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Introduction

Policy-makers, educators, and researchers have long assumed that a key to effective teaching in early childhood is the professional development of teachers, a process that can span formal educational experiences between high school and graduate school and include formal and informal training and mentoring experiences. One component of this effort to prepare and support effective teachers is state-wide Professional Development Systems (PDS), which is the set of requirements and procedures by which states determine who is qualified to teach and the mechanisms for preparing and qualifying teachers. More recent state efforts to improve teachers' effectiveness and classroom experiences for children include Quality Rating Systems (QRS) and statements of Early Childhood Education Competencies (ECEC). QRS are mechanisms for defining the optimal conditions for caring for and preparing children for school, and for encouraging and rewarding improvement to higher levels. QRS include ratings for continuous improvement as well as rating assessments. Throughout the paper we will use QRS to stand for both types. ECEC are statements that define what teachers need to know and do in order to create optimal learning opportunities for children. PDS prepare teachers for these tasks.

These two additions to the infrastructure for teacher preparation and support, QRS and ECEC, have largely been developed outside of existing PDS. In this paper we argue that PDS have to be better-integrated with QRS and ECEC in order to improve the delivery of ECE services, and we specifically focus on the need for research that documents their integration, linkages, and subsequent effects on teacher performance. Relatively little research has been conducted within QRS and ECEC systems, and even less is known about how they intersect and work together with PDS. It is the intention of this paper to stimulate conceptualization and planning of research on the components of, and linkages among, QRS, PDS, and ECEC, toward the aim of an evidence-driven system through which policy and program development can improve the quality of early childhood services offered to young children.

To put it another way, if we are confident about what teachers need to know and be able to do to be successful in classrooms (ECEC), we can build resources to prepare and support that knowledge and those skills and certify teachers' competence (PDS). We can then put in place accountability mechanisms that incent progress toward higher levels of competence and convey information about competence to stakeholders (QRS). To accomplish this overall aim requires these state efforts—ECEC, PDS, QRS—to be linked.

The NCRECE Leadership Symposium

This NCRECE White Paper builds on the second annual Leadership Symposium of the National Center for Research on Early Childhood Education (NCRECE) held in February 2008. At this meeting, the invited policy-makers, educators, state-level early childhood personnel, and researchers were given the challenge of first defining and describing PDS, QRS, and ECEC, and then creating a set of research questions and proposals that not only produce evidence to support and improve linkages among them, but also assist in building evidence-based systems that integrate preparation, licensure, in-service support, state competencies, and child outcomes into more coherent entities. Three dominant themes emerged from the symposium: 1) PDS themselves are largely non-systems (i.e., most professional development is not systematically linked to teacher, program, or child outcomes), 2) within a given state there are little or no linkages among PDS, QRS, and ECEC, and 3) there is very little consistency or alignment between what is articulated in policy, implemented within states or programs (e.g., guidelines,

activities, approaches, interventions), and the evidence that might support those policies or implementations.

It is tempting to look to the K-12 system for knowledge about linkages between professional development and competencies, but there are reasons to believe this pathway for identifying strategies may not be fruitful. First, ECE historically has been located outside of the K-12 educational system (administratively and policy-wise) in terms of state efforts that focus on teacher qualifications and preparation. There have been only a few successful attempts to align children's learning and development across ECE and K-12 systems, so even at the level of child outcomes there is no coherence or consistency from ECE to K-12. Therefore, the components of ECE systems (e.g., training, curriculum, evaluation) may not match categories typically used in the K-12 educational system. To illustrate, ECE teachers may have either formal education or training to be considered effective teachers in some systems, education is as likely to be in-service as pre-service, and, in many cases, students receiving pre-service in ECE at the four-year college level never actually teach in the ECE system. Moreover, and perhaps most importantly, there is very little evidence that the questions of relevance in this document about which we might look to K-12 for guidance, such as alignment of teacher competencies and professional development systems, have been addressed in K-12 in ways that produce better outcomes for children or teachers. In fact, recent discussions lament the lack of evidence for teacher preparation in K-12, and the wide-ranging alternatives to address needs of effective teachers suggest K-12 has had little traction on this complex issue. Therefore, in effect, early childhood education can most likely offer the best solutions for these complex challenges by utilizing lessons learned from the shortcomings of K-12, while recognizing uniqueness and possible assets in domains of teacher preparation and effective teaching.

The symposium discussion drew from a set of presentations by leaders in the field who work closely with state and national policy and program development related to improving the quality of early childhood programs through teacher preparation and professional development. These presentations (*listed at the end of this document and available at www.ncrece.org*) provided both a backdrop for discussions and a set of challenges to symposium participants. Not only was it evident that the field lacks evidence for many policies and state requirements related to teaching (again, not dissimilar to K-12), but that the linkages among state certification, quality rating system metrics, and systems of professional development are virtually unknown and unstudied, and to the extent they do exist, unplanned. Notwithstanding these challenges, each speaker argued that the issues of linkage and evidence were central to not only the future development and improvement of systems to support, license, and reward effective teaching, but also to the credibility of the field.

In this NCRECE White paper, we hope to advance the field by outlining the conceptual and evidentiary challenges identified in the symposium and offer suggestions for further study that could be undertaken by individuals and teams of investigators working collaboratively with states and programs. Such efforts, over time, would begin to close the evidence gap and contribute to better policy-making. We begin by elaborating on dominant themes of the symposium, the need for more evidence-based approaches within each system, and for research on linkages among systems. We describe what is known about PDS, QRS, and ECEC, and identify the overlapping and unique components of these systems. We then describe levels of necessary research: research that defines and describes the components of each "system" and research that can move the field towards an integrated system where PDS, QRS and ECEC are linked in a way that promotes effective service delivery to children.

*The Current State of Professional Development, Quality Rating,
and Early Childhood Competency Systems: 2008*

To reiterate, the ultimate intent of this paper is to envision state-level systems that link a) what children are intended to know and perform (state learning standards/guidelines), with b) the formal preparation, licensing, certification, and in-service requirements for teachers (Professional Development Systems), with c) approaches to monitoring, incentivizing, and communicating about program quality (Quality Rating Systems), and the expected approaches to instruction and supporting learning that define teachers' practices in relation to state learning standards for children (Early Childhood Educator Competencies). Our argument from the outset is that it makes sense that these elements of a state-level approach to early childhood programming should be linked, and that examining linkages and studying effects over time will help states improve policy-making and program development. Thus, the symposium and this paper are intended as an initial step in building a conceptual framework and evidence-trail in support of a more coherent, unified approach that binds these disparate and relatively separate entities into one system supporting children and teachers.

As a way of depicting our goals and establishing a common framework and lens for discussion, Figure 1 presents a conceptual frame for the discussion and for this report. Readers will see that the three primary foci for policy and program development that states use to ensure effective teaching and effective teachers are depicted as circles (Professional Development Systems, Quality Rating Systems, and for Early Childhood Education Competencies). Paired with each of these foci are a set of specific elements that are actually most often the vehicle for linking corresponding policy initiatives to practice and desired outcomes. The Figure also notes the potential of linkages among these three entities (and their constituent elements). Finally, the horizontal line aiming from left to right is intended to reflect that linkages, elements, and foci of policy can change, and through collecting data systematically, such change could be built on the basis of evidence. In the sections to follow, we focus on information presented at the symposium and gathered in the discussions that pertains to establishing this evidence base.

ECE Professional Development Systems:

The need for research- and theory-based professional development systems

A Professional Development System can be defined as having several core components, most common of which are higher education programs that prepare teachers, state and local resources that provide in-service support to teachers through workshops or courses, and a system of licensure and certification through which states use higher education programs and in-service training as a means of certifying teachers as qualified to teach in that state. By this definition, in 2008, according to administrative data, the vast majority of states have some forms of a professional development system operating to regulate the workforce in the early education and child care sectors.

However, these same administrative data suggest that there is highly uneven implementation of PDS across states. To be specific, states differentially regulate teaching staff and various forms of care; that is, they have different qualifications for these roles. For example, in 2006 78% of the states had pre-service higher education qualifications for center directors, while only 25% of states had higher education requirements for center teachers or for large family child care home providers. In short, states often see these roles as very different, when, in fact, each of these individuals are likely to be the primary "teacher" in a "classroom" setting, serving 3- and 4-year-olds; and, not surprisingly, these requirements differ from state to state.

Even when states require some level of pre-service preparation in higher education for entry into a professional role as a teacher, there is, in general, a low level of pre-service qualification required for licensure or certification in early childhood. For example, Child Development Associate certificates are the most common pre-service requirement for directors and master teachers in early childhood education programs, while experience alone or with a high school diploma is the most common minimum pre-service requirement for teachers. Only 40% of state PDS require a pre-service course on working with children with disabilities, and only 10% require a course on working with children learning English as a second language. Thus, apart from the background of variability in entry qualifications into various roles, compared to K-12, there is a rather low level of entry qualifications as well.

State professional development systems tend to put more emphasis on in-service training than pre-service qualifications for continued licensure, with 46% of states requiring on-going training for center teachers, 40% for center directors, and 36% for small family child care providers. This emphasis on on-the-job training (in contrast to pre-service training as noted above) places the burden of workforce quality on state and local systems of in-service support, rather than on state institutions of higher education and its well-established infrastructure and capacity. With regard to the primary point of this discussion, if states were to move to better exploit the capacity of higher education institutions in their approach to licensure and certification in all the varied roles in early childhood education and care, it would be imperative to make very close connections and linkages among teacher preparation in higher education and statements of teacher knowledge and skills competencies (ECEC) and standards for child outcomes.

A central issue throughout this discussion is the extent to which data are available on the linkages of interest—in this case, between professional development systems and ECEC; between degree status and teachers' knowledge/skills in competencies needed for certification. For the most part, states do not collect the type of information needed to examine this connection (this being a reason for the widely-noted lack of association between a BA degree and classroom quality). State administrative data collected as a part of PDS typically document how many early childhood program staff have participated in various sanctioned training activities (e.g., courses) and at what level (e.g., AA, BA). However, we know little about how PDS are working or what impact they have had on the ECE systems; states do not have information on individuals' training, licensure, certification status, and their knowledge and skills in the classroom. Rather, states certify higher education and in-service programs on the basis of mapping coursework and fieldwork onto state competencies and assume that individuals who progress through these training and preparation experiences have the desired knowledge and skills.

Another issue with regard to professional development systems, particularly for on-going training and in-service support, is the extent to which teachers and providers make use of resources when they are available. This is key to understanding and using PDS as a mechanism for improving teaching in ECE. For any improvements in effective teaching, teachers and providers have to be motivated and provided with opportunities to participate in professional development. In the field of early childhood education, low compensation and recognition often interfere with teachers' and providers' motivation and opportunity to engage in professional development. It has been suggested by proponents of Quality Rating Systems that by directly assessing program quality and linking helpful resources and training requirements to those assessments, such systems have the potential to incent teachers' participation in in-service training and support. The need to facilitate teachers to participate in PD would also provide incentive for programs to provide supports for PD such as paid time-off for required PD activities, and sponsorship of PD attendance (e.g., pay for workshops, hiring internal coaches,

providing substitute teachers, etc.). Again, this suggests an important link between states' Professional Development Systems and QRS that should be made explicit and studied.

A final, and particularly important, consideration concerns the type and intensity of professional development that may be necessary to create and sustain changes in teachers' practice. Thus, although the vast majority of PDS focus on coursework and workshops as the primary vehicles for preparation and training, we now know that the daily interactions that teachers have with children are critical to children's social and academic development and are just learning how to go about changing these interactions. We need more research in this area in order to more effectively support our teachers and improve student outcomes. Recent research suggests that targeted intervention into teacher interactions with children and instructional climate for academic skills such as the *MyTeachingPartner* work by Pianta and colleagues can increase effective teaching and children's academic gains (more information can be found at www.myteachingpartner.net). Other evidence such as the QUINCE project by Bryant (2007) and colleagues suggests that on-going mentoring and consultation increases effective teaching. Mentoring and training are very difficult to measure and to bring to scale, though relatively "easy" to prescribe as the professional development answer. One critical component of bringing mentoring to scale concerns the ability of systems to prepare and regulate mentors, yet only three states have defined core competencies for technical assistant providers.

In sum, there is a clear and compelling rationale for state PDS (e.g., pre-service and PD in the context of higher education programs, in-service training, licensure and certification requirements) to be closely connected to the descriptions of state competencies and the systems of monitoring and incentives that can be used as leverage to improve program quality and child outcomes.

ECE Quality Rating Systems:

Measuring teacher effectiveness, classroom processes, children's outcomes

Quality Rating Systems fundamentally are mechanisms for defining the optimal conditions for caring for and preparing children for school and for encouraging and rewarding improvement to higher levels. They provide a way to open the system of early childhood programs to market-based forces (consumers of child care have information on quality, for example) and they offer a variety of mechanisms for states to define levels of quality and desirable outcomes for the programs in which they invest, which, in turn, become markers for monitoring and resource allocation. Mitchell (2005) has written extensively about QRS and they are featured in the Pew Early Childhood Accountability framework.

Since the 1990s, the number of states with Quality Rating Systems has grown and systems have evolved in several ways. No longer funded solely by state-level sources, many initiatives are now funded through multiple sources, including foundations. The diverse funding sources for QRS may bring multiple and diverse requirements, impacting how these systems change. Although intended to apply to the entire range of early childhood programming (family-based child care, formal and informal settings, center-based preschools), another development is the increasing participation of state pre-kindergarten programs in QRS. Originally designed to guide consumers (e.g., parents), QRS now are driving changes in ECE programs, especially in professional development requirements.

As has been mentioned, states vary considerably in whether they are adopting a QRS, the components of the QRS (classroom observation, child outcomes, teacher qualifications, etc.), and the specific metrics the states extract from these components and the definitions for

identifying a “quality” program. For example, for states in which classroom observation might be a component, states may vary on the nature of the observation system used and the actual levels of scores obtained from that use, as they identify classrooms that meet or do not meet certain standards. Every one of these decisions could be informed by data as the systems are constructed, but more important are the data that could be collected as systems are implemented and refined, so that they are improved in terms of efficiency and effectiveness over time.

For example, states using QRS could pool information on their components, metrics, and definitions for quality, and comparisons across states could inform efficiency and resource planning as states learn from one another about costs, staffing, and how metrics perform in the field. Furthermore, if a given state(s) gathered information on teachers’ professional development experiences as a function of QRS, and the costs and returns of that professional development to quality and child outcomes (or ECE competencies), then the QRS, as a system for monitoring and incentivizing program improvement, might be fine-tuned over time to align more closely with effective professional development opportunities.

In many ways, QRS should function as a mechanism for linking professional development systems and states’ lists of competencies for early childhood educators. In theory, the QRS monitoring systems would include valid measures of competencies that would also be reflected in the coursework and training offered to teachers through higher education and local/state in-service offerings. Again, we argue that the linkages among these systems are critical if any one of them is to achieve its potential for improvement of programs across a state.

The Maine Roads to Quality Registry is an example of a state-wide effort to link teacher qualifications and training to early childhood competencies (Mayfield, Mauzy, Foulkes, Dean, & Foulkes, 2007). Teachers who join the registry receive a registry certificate, registry transcript, career counseling, and eligibility for other programs including scholarships. The Maine Roads Core Knowledge Training Program is an affiliated 180-hour training program that is aligned with Maine’s K-12 Learning Results, with accrediting and legislative requirements, and prepares teachers to work with children according to the competency priorities of the state. Maine is an example of one of several states including Missouri, Montana, and Wisconsin who joined the National Registry Alliance to develop best practices for data collection systems which are exemplars of designing mechanisms for documenting and encouraging improvement and defining the optimal practices for preparing children for school.

ECEC:

What do ECE teachers need to know and do?

ECE competencies are what ECE educators need to know and do to demonstrate that they are well prepared to effectively educate and care for young children. Clearly, there are a host of knowledge domains as well as skills that could be included in these systems and often there are multiple layers of organization in ECE competency lists. ECE competencies typically start with broad concepts or domains of knowledge and skill (e.g., knowledge about child development, working with families). Within those broad domains are clusters of specific knowledge areas and skills. For example, the domain of *Knowledge about Human Growth and Development* could include clusters of knowledge areas pertaining to cognitive development, social development, or physical growth and development, with each one of these areas then broken down into specific information (e.g., understands pathways of syntactic development or understands role of attachment in emotional development). Similarly, in broad skill domains (e.g., working with families) one might find a cluster of skills around “transition planning with families” that could

then be defined in terms of “plans and implements effective transition plans with parents.” Thus a key aspect of ECEC systems and lists is this multi-layered organization of knowledge and skills and the very large range and number of units within each layer. Their very complexity is often an impediment to their utility.

Interestingly, unlike K-12 where all states have lists of teacher competencies for knowledge and skills, only twenty-six states have competency standards for early childhood educators, with similarities across states. For those states with competencies specified, across states there is wide variation in the number of levels and content of each level. Moreover, most states map these competencies onto various forms of certification, licensure, and role within the ECE workforce, and again there is considerable variation in this mapping. Some states organize competencies by titles (Director, Teacher, Aide), some by degree (CDA, AA, BA, MA) and some by levels on a career ladder. By and large, there is very little evidence to inform this mapping process and often it can seem quite arbitrary. There is little evidence to drive decisions about what a teacher needs to know and do that is separate from a teacher’s aide, for example, and even less evidence that ties specific knowledge or skills to a specific degree, in terms of how that combination of knowledge/skills and degree or role is critical for advancing the quality of the ECE programming offered in a state and child outcomes.

More important, for the focus of this paper, is the need for linkage between state competencies and the systems on which states rely to produce those competencies (PDS), and the systems to monitor, make them public, and align them with outcomes (QRS). A critical issue for linkage is the level of detail or specificity at which linkage is sought—for example, do QRS operate to ensure “knowledge of cognitive development” or “skill in transition planning” through direct assessment of teacher knowledge or observation of skills, which would be linkage at a rather specific level, or through some check-off that the teacher took a course with that title, a rather general level of linkage? Furthermore, the lack of assessments available for many of these knowledge and skill domains, which could be used as metrics in a QRS or as drivers for designing professional development opportunities, is a major impediment to the efficient and effective use of state competencies as a mechanism for improvement of early childhood programs. Our ability to develop research- and theory-based ECE competencies is limited by our lack of reliable and valid assessments of teacher knowledge. The development of such a measure would greatly enhance our ability to connect the field and reduce the complexity of this problem.

How best to provide the resources needed to ensure that teachers have these competences is not yet known. Even at entry level, what a teacher needs to know is substantial. Assuring that the competencies address a wide range of issues is challenging—they need to address cultural and linguistic diversity, be applicable to infants through eight-year-olds and to family child care providers as well as classroom teachers, and include knowledge and skills related to special needs children, to name a few.

What Data Are Being Collected as Part of the Implementation of QRS, Competency Systems, and Professional Development?

To study the integration of these three systems it is important to assess the data being collected as part of the implementation of QRS, Competency standards, and Professional Development. The short answer to this question is that, within a state, almost no data are collected in the same way across systems, and what data are being collected is very different across states. Moreover, given turnover rates of personnel across the system, data quickly become outdated.

Figure 1 notes the main focal areas of each of the three systems and the major domains from which, if consistent data were available, we would be better positioned to understand and enhance the integration of systems.

However, as States become more proficient in collecting and making administrative data accessible, it can be useful in addressing preliminary descriptive questions. Likewise, as national efforts are launched to capture and make equivalent data collection efforts across states these descriptions can be made on the national level. Examples of these efforts are described in the following section.

Within the state competency area, teacher registries are the best example of the data typically collected. A teacher registry is a local, state, or national database that gathers listings of teachers and their certification or professional development. Registries exist in 28 states. They are a good source of data to track the content of teachers' training and education and some track competencies of the trainers of ECE competencies. The National Registry Alliance has developed core data elements to address cross-state consistency in definition and measurement in teacher registries. Cross-state consistency allows for tracking of professional development on a more national level, and benefits teachers who have a resource to document their qualifications to current employers and to bring their credentials with them should they move across states. Finally, teacher registries allow stakeholders to better understand the connection between teacher education, training, experience, and outcome measures, such as teacher turnover and alignment with early childhood standards.

The National Association of Child Care Resource and Referral Agencies (NACCRRRA) conducted a survey focusing on training provided by CCR&Rs to approximately 500,000 providers, teachers and administrators (Smith, Sarkar, Perry-Manning, & Schmalzried, 2006). The survey distinguished between discrete workshops and sequenced workshops and asked about qualifications of those providing the training and the content addressed by training. NACCRRRA is currently piloting an extension of its software program (NACCRRAware) to include on-going documentation of Training and Technical Assistance. This is a promising step in the direction of linking professional development opportunities (e.g., course and workshops) to the individuals enrolled in these opportunities, which could serve the purpose of helping determine if these opportunities are effective. However, a periodic survey, such as this, is not as useful in terms of tracking exposure and effects as a registry and had as its purpose the linking of individuals to training opportunities and enrollment.

Within the QRS area, the data collection systems underlying QRS are a source of information on various features of early childhood programs/services (e.g., teacher/child ratios, class sizes, observations of classrooms) and the professional development experiences and credentials of ECE staff, usually all staff in a program. Across states, QRS data vary based on the elements of the system. QRS administrators and researchers often find it efficient to examine QRS data, but these databases do not meet all needs. For example, for technical assistance purposes, a behavior-specific measure is useful, but that level of specificity may not be needed for other purposes. As a specific example, many QRS systems use the Early Childhood Environmental Rating Scale ECERS (Harms, Clifford, & Cryer, 1998). While individual ECERS items or subscale scores may assist programs in quality improvement for research purposes, an overall score is more meaningful.

Overall, QRS procedures also vary on how data are collected, whether by outside independent observers or self-report measures. Relying on teachers and caregivers as a source for information of their own behaviors is problematic. This is particularly true when the

measurement is high stakes. For example, if teachers' or programs' funding is dependent on high QRS scores, the only sensible strategy for teachers is to rate each child as competent and each classroom as high in quality.

There are other measurement issues related to the constructs assessed in QRS. First, relatively easy structural measures that serve as markers of quality in QRS (formal education, credentials, training, certification) may not indeed measure effective teaching or quality ECE programs. Increasing research evidence suggests that these markers by themselves do not map onto children's academic readiness for school (Early, et al., 2006, 2007). Furthermore, evidence suggests that the context of the teaching interacts with the professional development of the teacher (Howes, James, & Ritchie, 2003; Vu, Jeon, Howes, 2008). That is to say, it is unlikely that a constrained set of professional development experiences will help all teachers equally or meet the diverse needs of teachers working in increasingly diverse settings.

Second, it is difficult and expensive to measure what may really matter to children's academic readiness for school, though certainly possible. Classroom observations may be critical to the process of improving ECE settings, given the unreliable connection between more readily available data (e.g., teacher education, rations) and child outcomes. Observational assessments are difficult to implement, especially at the scale required for this endeavor, requiring considerable resources for training observers and traveling to conduct classroom observations. However, the types of teacher-child interactions that are associated with student outcomes cannot be self-assessed by teachers. Thus, including observation as a component of QRS is an expensive venture.

A third challenge for QRS data is the reliability of the data that are collected. A fair and credible system of accountability is required. Are observers and portfolio raters trained and reliable? Can we guarantee teachers and programs that they will get the same ratings, regardless of who comes to perform that rating? If child measures are part of the QRS, are they collected by independent, certified assessors or by teacher report? If by teacher report, how well are teachers trained? Validity and cultural appropriateness of measures are concerns. For a QRS or QRS to translate into improvements in children's social and academic development, we need to pay attention to how closely aligned the components of the system are with child outcomes. Are the observational measures used global quality ratings or specific teaching strategies? Is there evidence that links the measures to children's pre-academic success? Given the diversity of early childhood programs, QRS also need to be concerned with the extent to which measures are appropriate to the cultural and linguistic diversity of the children and families in the system. We do not have good measures of culturally responsive pedagogy and family/community support. Better articulation of the outcomes we desire in family support practices and cultural competency is needed, as well as more specificity as to that which teachers should be responsible.

The Barriers to Integration of Systems

The section above noted several differences between the data available from PDS, QRS and ECEC systems, differences that make it challenging to integrate the systems. Other barriers to integration exist. States tend to regulate programs rather than having a PDS; that is, states require ECE programs to hire teachers who have certain numbers of courses or, in some cases, a degree. State institutions of higher education at the two- or four-year level may offer courses or degrees, but these are not necessarily matched to regulations, QRS, or explicitly to ECEC. In addition, training is often disconnected from education, typically because training and technical assistance are provided by state or local agencies (e.g., CCR&Rs), which are not part of

institutions of higher education and do not align their professional development with community colleges and universities. The largest part of the burden of PDS falls mainly on these agencies and they typically provide PD via workshops, mentoring, and consultation. There is no regulation of the quality of this PD or the extent to which it is aligned with the other systems and, as with teachers, there is high turnover of trainers and TA providers.

Integrating the Three Systems

Ideally, the integration of these three systems would be based on a logic model that is empirically informed, provides explicit rationale for linkages among the systems, and ultimately results in children's positive development. Proposed steps in this logic model are outlined below:

1. The foundation of an integrated system should be children's early learning standards, defined in accord with or elaborating on existing early childhood performance standards (e.g., Head Start, NAEYC) and in collaboration with the K-12 system.
2. Then, a set of Early Childhood Educator competencies needs to be developed that encompasses the knowledge and skills necessary to help children learn the skills identified in the pre-established early learning standards, as supported by recent research. What do teachers need to know and be able to do in classrooms that promotes children's learning?
3. Then, both pre-service and in-service Professional Development experiences need to be developed to address these research-based core ECE competencies. Efforts must be made to empirically examine professional development experiences, whether a college-level, semester-long course as part of a degree program or an in-service mentorship program, and determine which PD experiences actually result in teacher development among the ECE competencies and which experiences may be most helpful for teachers. This on-going process will lead to the availability of a dynamic, ever-growing suite of PD resources/ experiences with known links to ECE competencies.
4. Then, Quality Rating Systems need to be designed so that they directly measure the teacher knowledge and skills that are listed in the core ECE competencies, and are being taught and supported through available PD systems.
5. With all of the systems aligned in the above-mentioned manner, QRS data can then be utilized in at least three different ways to solidify linkages across the three systems:
 - a. As an accountability mechanism, QRS data can be used to ensure that ECE competencies are related to children's learning in expected ways.
 - b. As a slightly different accountability mechanism, QRS data can be used to ensure that teachers experiencing certain types of PD are making expected improvements in ECE competencies.
 - c. As a feedback mechanism, QRS data can be used to identify teachers who are struggling with specific ECE competencies and link them with a PD experience that addresses these competencies.

What Study Designs Could Evaluate the Integration of Professional Development into QRS and Competencies Systems?

The symposium participants worked in small groups to expand and elaborate the constructs needed to better study the three components of the system . (See Table 1 for a complete list of constructs developed.) We concluded that within-system questions (e.g., Does some form of PD work?) as well as cross-system questions (e.g., Are PD and QRS aligned and, if so, to what effect?) could form the basis of new research projects. In this section of the paper we use the constructs and designs generated by the participants to craft a framework in which individuals

in a particular agency can locate their work within the whole system and perhaps begin to address gaps in the system. We also attempt to delineate some of the important research that should be conducted.

Although, as we have discussed data collection efforts are uneven, using existing data is most desirable in terms of cost. However, due to the concerns mentioned earlier, any data collection effort will probably need to collect new data. This is an understudied area and there is essentially no data comparable across states. There is no standardization of definitions, terms, elements of systems, categories of children/families served, parts of workforce covered, and perhaps more.

Research could be conducted *within* a state to better understand its own system, and *across* states to better understand PD/QRS systems, and ideally both types of research would be funded. States with more advanced and linked PD data systems can assist states beginning to create or change their systems, although state context (e.g., population density, poverty levels) might lead one state to address a particular issue in a different way than another.

Designing research. Several types of studies were discussed by symposium participants as noted below:

A validation study within a particular state, especially one with data in each of the three domains discussed here, could test the linkages between the hypothesized connections—for example, more training leads to better quality teaching which leads to better children's outcomes. Such a study would need the cooperation of the various agencies that were the gatekeepers of the data and probably some third-party linking of identifiers, but it would allow examination of some of the assumptions. Similar studies replicated over several states or communities would be even more instructive. Several relatively small-scale validation studies of PD systems would be useful if the researchers were particularly careful to nest the validation within a described context (e.g., child income and ethnic background, sector of care [FCC, Pre-K, etc.], infra-structure support).

Another type of design is a logic model and literature validation study (or studies) based on a small number of states to describe through stakeholders eyes what they intend to do (logic model), the dimensions they have selected into their PD system, and the literature that supports the inclusion of those dimensions and the logical links between them. This work would use the existing evidence base for the dimensions and desired outcomes of those dimensions.

A third type of study discussed by participants were descriptive studies that could document the variations in PD systems across states and communities and the various levels of integration of PD into ECE competencies and QRS that are found. This would need to go beyond surveys in order to capture the complexity and commonality (or not) of the various systems.

- Case study comparisons of the integration of PD into QRS and ECE competencies in a small number of selected states would be very helpful.
- Use ethnographic methods and open ended questions to interview teacher participants, higher education faculty, and trainers.
- Observe implementation of selected PD and QRS using ethnographic descriptions.
- Use NCRECE measures of teacher knowledge, teacher performance, and child outcome as validation instruments for a selected number of teacher and classrooms in each state.

Finally, although expensive to conduct, larger-scale studies that might incorporate the dimensions and variations of all three systems would allow all the links in the chains to be assessed. Data from such studies could be used to focus on the dimensions that are shown to be most important for quality outcomes or children's outcomes, to set the gradations of PD or QRS systems more evenly, and, ideally, to trim the amount of data needed to the essential elements that account for the most variance.

Conclusion

This exercise, the symposium and the development of the White Paper has highlighted both the promise and the short- and long-term challenges of research designed to examine the interface between PD, QRS, and ECEC systems. The first step in such a research program is measure development. The logic model and validation research designs described above as first steps in this research process both require careful definition of constructs and their operational definitions in administrative data. Furthermore, measurement development must be completed with attention to context of teaching and to definitional discrepancies and commonalities within and across administrative and research data. We recommend that requests for proposals be issued by public and foundation funding sources to complete these tasks of measurement development. Once reliable and valid measures are in place, we recommend a series of small-scale studies to describe these systems and their overlap. Finally, any hard conclusions about the efficacy of these systems, their interface, and their influences on teaching practices and children's development await large-scale studies that include direct independent observations within classrooms and family child care homes.

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Table 1. *Constructs and Their Components*

Construct	Components/Issues
Child	What is the age range of children included in the system? Are the systems adjusted to be appropriate for children in different age groups, e.g. toddler vs. school age Are child outcomes in synchrony with ECE competencies, PD, and QRS?
The workforce	What is the scope of the workforce included in systems? For example, is it only people in direct instruction and care, or does it include support staff (e.g., nutritionists, those providing transportation, etc.).
The setting	Which settings are included in systems? For example, are family-friend and neighbor care included? Are we only including people who accept payment for their services or others as well?
Professional development system components	How does the state define the workforce, ie. degree, credential, certificate? Does formal education include both degree and major? Is course content embedded within degree program, e.g. course at community college vs. course in BA program? Is the course as part of training equivalent to a college credit course? Is the course pre-service or in-service? Can an assets approach be used, i.e., participation in professional meeting, participation in intensive training (sequenced sessions), discussing professional progress, having support person visit program?
Quality & accountability in PD training	Are the PD trainers certified? Is the course curriculum codified? Has the training program been evaluated?
Context of teaching	What is the form of care? Is there more than one adult in the classroom? Is there supervision? Is there mentoring? Is there accountability? What is the infra-structure of support for teacher?
Program support	What is the program administrator education, training, skills and experience with supervision?
Families and children served	Maternal education, income level, ethnicity, home language, immigrant status
Baseline of PD infrastructure by state	Is there integration of State learning standards and ECE competencies? What is the role of higher education in ECE PD? Are the ECE competencies integrated into coursework?
Trainer	What is the range of skills? What are the levels of practitioners they are qualified to train?
State licensing system	What is the basis of licensing regulations? Does licensing vary by funding stream?
Subsidized child care system	What is the interrelation between subsidies and QRS based reimbursements?
Capacity and sustainability	Do QRS systems create programs that are available for all families? Does the capacity of the system remain the same after improvements? Are the systems sustainable? What is the capacity of the State to continually support systems?
Child	What is the age range of children included in the system? Are the systems adjusted to be appropriate for children in different age groups, e.g. toddler vs. school age Are child outcomes in synchrony with ECE competencies, PD, and QRS?
The workforce	What is the scope of the workforce included in systems? For example, is it only people in direct instruction and care, or does it include support staff (e.g., nutritionists, those providing transportation, etc.).

Figure 1

Ensuring Effective Teachers

