Early childhood education and ESEA
Connecting Early Education to K-3 through Professional Development for Effective Teaching and Learning

Robert C. Pianta, Ph.D.
Curry School of Education
University of Virginia

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Let me start by commending the committee on its interest in early childhood education as part of the approach to ESEA authorization. The loosely organized system of educational and developmental opportunities to which young children are exposed in child care, state-funded pre-k programs, Head Start programs, k-3 classrooms, and a host of other settings (including children's homes), increasingly is viewed as a point of leverage for addressing low levels of, and gaps in, K-12 achievement. This is sensible policy: learning is cumulative and the skills and knowledge that children acquire early are foundational underpinnings of what they learn later – fall behind early and stay behind is the rule. The time for serious policy and program work connecting early childhood education with k-12 is now.

We now know that the long-term effects of early gaps in achievement and social functioning are so pronounced that effective and efficient early education interventions targeted toward these gaps in the preschool period are essential, not only to the developmental success of children, but to the economic and social health of communities. Both small experimental studies and evaluations of large-scale programs show consistently the positive impacts of exposure to preschool. The evidence comes from studies of child care, Head Start, and public school programs using a wide range of research methods including experiments. Lasting positive impacts have been found for large-scale public programs as well as for intensive programs implemented on a small scale, though even some of the intensive small-scale interventions were public school programs. Overall the positive long-term effects of preschool education include: increased achievement test scores, decreased grade repetition and special education rates, increased educational attainment, higher adult earnings, and improvements in social and emotional development and behavior, including delinquency and crime. Obviously, if programs provide child care they also benefit parents and can increase earnings in both the short and long-term. Increased income that results from providing families with free or subsidized child care also has positive benefits for young children's development, though these are likely small relative to the direct benefits of high-quality preschool programs for children.

Who can benefit from educationally effective preschool programs? All children have been found to benefit from high-quality preschool education. Claims that preschool programs only benefit boys or girls, or one particular ethnic group, or just children in poverty do not hold up across the research literature as a whole. Children from lower-income families do tend to gain more from good preschool education than do more advantaged children. However, the educational achievement gains for non-disadvantaged children are substantial, perhaps 75 percent as large as the gains for low-income children. Some concerned with reducing the achievement gap between children in poverty and others might conclude that preschool programs

should target only children in poverty. Such an approach ignores evidence that disadvantaged children appear to learn more when they attend preschool programs with more advantaged peers, and they also benefit from peer effects on learning in kindergarten and the early elementary grades when their classmates have attended quality preschool programs.

But we must be very clear about the magnitude of effects, whether short or long term. Any of the evaluations cited above indicate preschool programs produce *modest* effect sizes overall, somewhat greater effects for low-income children, with some evidence that gains last through early grades. Typical child care has considerably smaller short- and long-term effects than more educationally focused programs such as selected Head Start programs or higher-quality preschool programs linked to public education. And across studies and program models/features effects range from near-zero to almost a standard-deviation on achievement tests (the size of the achievement gap for poor children). There is no evidence whatsoever that the average run-of-the-mill preschool program produces benefits in line with what the best program produce. Thus on average, the non-system that is preschool in the United States narrows the achievement gap by about 30%.

Thus despite significant investments and obvious benefits, the promise of early education as a scaled-up asset for fostering learning and development of young children in the US is not yet being fully realized–too many children, particularly poor children, continue to enter kindergarten far behind their peers. Results from the first follow-up of the nationally representative Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) show a gap of roughly one standard deviation on school readiness skills for children below the 20th percentile on family socioeconomic status. Because the wide-ranging and diverse set of experiences in preschools are not, in aggregate, producing the level and rate of skills gains required for children to enter school ready, it is argued that simply enrolling more children in more programs, although helpful, will not close, or even narrow in noticeable ways, the skills gap at school entry. Rather there is a dire need for investments and attention (in research, program development, and policy initiatives) that *enhance the positive impacts* of existing and expanding educational offerings on the very child outcomes on which skills gaps are so evident.

How to construct delivery systems for the equitable distribution of such experiences, ensure the training and expertise necessary to support the value of early education, and evaluate the extent to which the delivery system produces desired outcomes for children pose serious challenges for scientists and policy-makers. K-12 education policy and practice is now grappling with, and relying on, early childhood education to an unprecedented extent, the strategic use of which is undoubtedly in the interest of America. It is quite clear that realizing the promise of early education in the United States depends on a more complete integration of early education and care experiences for 3 and 4 year olds with the k-3 system. Your opportunity, in ESEA reauthorization, I believe, is the set in motion policies that design a new entry portal into public education in the United States, one that ensures effective, integrated, aligned educational experiences for children from 3 to 8. Failing to take advantage of this opportunity only costs more downstream.

The landscape of early education – School starts at 3, sort of

One might ask, "How can school start at 3? Kids are at home or in child care, and compulsory education doesn't even start at age 5 in most states—and in some they don't even have universal kindergarten!" In some ways this perception is correct; from age 3 until whatever age enrollment in the K-12 system is mandatory, children spend time in a very loosely organized collection of settings that provide a mixed assortment of opportunities for learning. This could

hardly be described as "school" if our referent point was the local elementary school. On the other hand, parents think child care is school—in the 2000 Current Population Survey, 52% of parents reported their 3- and 4-year-old children were "in school," some 4,000,000 children overall. Many parents seek out child care that is advertised as "improving your child's school readiness" and some purchase billions of dollars worth of educational materials to which they expose their children as early as the first months of life.

Early education and child care settings historically have viewed learning and achievement as by-products of enrollment or exposure--one could hardly describe that as a "school." But in the last decade the early education and care system has systematically re-focused and re-organized into loose collection of opportunities to learn that are increasingly intentional, purposeful, and driven by education policy and standards—a virtual school distributed across various settings. State and Federal pressure on early education and care is revealed in voters' expectations that investments in the increasing formalization of this system will produce "school readiness" in the children who enter kindergarten and the analyses of economists who present the financial benefits to a community of investment in early education. K-12 education is now paying attention to the early education and care pipeline.

Over the past four decades, the federal government and most states have invested heavily in providing public preschool programs for 3- and 4-year-old children. The percentage of preschoolers in child care increased from 17% in 1965 to about 80% in 2008. A marked increase in publicly funded programs accompanied this overall increase; Head Start was established in 1965 and by 2007-2008 served nearly 900,000 children in this age range. State-funded public pre-kindergarten programs greatly expanded during the past 20 years. Now 38 states offer these programs, which served approximately 1.1 million children across the nation in 2007-2008. By 2008, about 80% of American children attended a center-based preschool program the year prior to kindergarten, most in private programs. Just over half attended a center-based program the year before that (at age 3), with two out of three of these in a private program. The combination of increased enrollment, expansion of publicly-funded preschool programs, and recognition of the unique role of early education experiences in the establishment of education success has led to a current state in which school, for all intents and purposes, starts for the vast majority of children in the United States at age 4, and for many, at 3. However, despite this general pattern, the fragmentation of policy and programs is considerable.

A widely understood example of policy fragmentation and its impact on experience is the set of regulations regarding access to K-12 opportunities. The age for compulsory school attendance in the United States ranges from 5 to 8 (Education Commission of the States [ECS], 2000), while kindergarten attendance is mandatory in some states and optional in others. Kindergarten lasts two and one-half hours in some states, and a full day (6-7 hours) in others and state-funded pre-k programs range from as short as 2.5 hours per day and as long as 10 hours per day.

The situation is far worse with regard to the balkanization and fragmentation of programs for younger children. The term "preschool" encompasses a diverse array of programs under a variety of names and auspices for children who have not yet entered kindergarten. Again we focus here only on three broad types of programs serving children at ages 3 and 4 linked to largely separate public funding streams: private child care centers, Head Start, and pre-K programs in public education. Yet the real landscape of preschool is far broader and more complex.

Enrollment of 4-year-olds is split nearly 50-50 between public (including special education) and private programs. Private programs serve about 1.6 million 4-year-olds, including children receiving public supports such as subsidies to attend these private programs. Public programs include the about 1 million children in pre-K (regular and special education and the 450,000 4-year-olds in Head Start. At age 3, private programs predominate, serving roughly 1.4 million children. State-funded pre-K (regular and special education) serves only about 250,000 children at age 3, while Head Start serves about 320,000 3-year-olds. The point here is that even if we focus only on a narrow "slice" of the age 3 – 3rd grade span, in this case, opportunities for 3- and 4-year-olds, we see little to no evidence of consistency in policy or on programmatic initiatives that create the templates for local opportunities for children and families. In thousands of communities across the country, children, particularly the most vulnerable, are funneled into one program at 3 and then shuffled to another at 4, and yet another at 5—or worse they are among those who lack access to any of these opportunities. And most have some other sort of child care (subsidized or not) at some point in the day or week. To be concrete, if the public schools cannot manage to offer universal full-day kindergarten, then how does one go about conceptualizing and designing a system of early education and care that is aligned with it? I hope you can see the need for an age 3-3rd grade approach to policy and program improvement.

For the considerable investments of time, money and effort in early education of 3 and 4 year olds to pay off, a primary goal of policy and program development must now be the alignment of the learning opportunities, standards, assessments, and goals in early education with those in K-12.

The workforce

Enrollment of 3- and 4-year olds in early education programs is pressuring the supply chain for early childhood educators and for effective training of those educators. Universal pre-k programs for 4 year olds will require at least 200,000 teachers, with estimates of 50,000 new, additional teachers needed by 2020. Ninety-five percent of the workforce currently staffing formal preschool and early education programs comes from 4-year and 2-year early childhood training programs and certified teachers from the K-12 system, with some unknown number of adults with unknown credentials staffing family-based child care and informal care. Unlike K-12 in which the supply chain is regulated by a single state entity and typically requires a 4-year degree from an accredited institution (or equivalent), training of the early education and care workforce is widely distributed and loosely regulated. Even in state-funded pre-k programs, rapidly ramping-up has forced many states to rely on teachers with elementary grade certifications and teachers with 2-year degrees "grandfathered" into certification. Growing demand has created problems both in relation to supply of early educators who can staff expanding programs and in terms of providing new teachers with appropriate training, staff development, and support to ensure that they create learning opportunities that produce achievement.

The attributes and skills of the adults who staff elementary school and pre-school educational settings tend to be very different. At the kindergarten level, nearly all states require a Bachelor's degree and some level of specialized training in education for adults to be certified to teach and over 95% of the teachers in kindergarten classrooms meet both criteria. Even though many have only sparse training in teaching your children.

In contrast, preschool teachers vary widely in their level of training and, on average, receive less training and education than their elementary school counterparts. There are large

differences even among teachers in state-funded pre-K programs. Minimum requirements range from a Child Development Associate (CDA) certificate to an Associate's degree to a Bachelor's degree. Furthermore, some states require that the 2- or 4-year degree be in early childhood education or child development, while others do not specify a field of study. Even in the fairly well-regulated domains of state-funded pre-kindergarten programs and kindergarten, there is substantial variance in the preparation and qualifications deemed necessary for the workforce, a reality that seems indefensible given the developmental needs of 4- and 5-year-olds. How could fostering early literacy for a 4-year-old require such a different preparation than fostering literacy in a 5-year-old?

Head Start has national standards for program structure, operation and teacher credentials, but does not require all teachers to have college degrees. Head Start is increasing their educational standards for teachers and educational coordinators, with aims that all Head Start teachers will have at least an Associates (AA) degree specialized in early childhood, and all education coordinators have at least an BA degree specialized in early childhood by the 2011 school year. And at least 50% of the Lead teachers in Head Start must have at least a BA degree by 2013. As I will note later, there is no evidence that garden variety educational experiences – coursework – will lead these teachers to be more effective in the classroom.

For children enrolled in the less-regulated ecology of family- or center-based child care, exposure to credentialed or degreed staff is even lower. The 2007 child care licensing study was one of the more recent and comprehensive studies of the child care workforce. Drawing on data gathered from 49 states and the District of Columbia, in the vast majority of states (42) directors of child care centers are only required to have some occupational/vocational training, some higher education credit hours in early childhood education, or a Child Development Associate's credential. Only one state required that directors of child care centers hold a Bachelor's degree. Similarly, for individuals considered as teachers in licensed child care centers, 40 states required some combination of a high school degree and experience. Only 10 states required some vocational program, certificate or CDA, and 13 states had no requisite educational qualification for child care teachers.

Capable early education is a complex and challenging task – teachers need to know a lot about basic child development, far more than the typical course – and they need to know about how to teach and stimulate vocabulary, conversations, early literacy, knowledge of science and the community, and early mathematics – all the while handling sensitively the varied needs of 15-25 3-8 year-olds – and within a classroom of 3 year olds the range of skills can go from 2 years to 5, while in a classroom of 8 year olds it could range from 2-12. Imagine the training and support required to support the developmental and educational growth of all those children!

Clearly we have not settled on a set of minimal qualifications for adults serving in the role of teachers of young children, whether this teaching takes places in community child care, Head Start, public Pre-K o k-3 classrooms. And we have not even begun to address the need to be consistent in our regulation and training of those skills across the 3-3rd grade span.

In short, to the extent that teachers play an essential role in fostering effective learning opportunities for young children, children passing through the preschool-3rd grade period can expect a stunning level of variation from year to year and setting to setting in even the most basic features (i.e., educational level) of these personnel.

And consistent with nearly every other form of teacher training, there is so little evidence linking pre-service or in-service training experiences or teacher credentials to child outcomes or to observed performance for teachers, that there is considerable debate about whether requiring a

4-year degree is the best way to ensure early education programs help children learn. Addressing workforce needs in this system will require a re-thinking and re-balancing of several factors, including incentives, the content and processes of training, and efforts to professionalize the workforce and integrate the early education system with K-3.

What makes for an effective teacher in pk-3?

Degrees are poor proxies for the instructional and social interactions teachers have with children in classrooms. Children's direct experiences with teachers, such as the ways teachers implement activities and lessons; whether a teacher is encouraging and able to assist the child if he/she is struggling; whether the teacher uses the opportunity to engage the child in conversation are the features of early education that are responsible for children's learning. The active ingredient for learning is what a teacher does, and how she does it, when interacting with a child.

Effective teaching in early education, including the elementary grades, requires skillful combinations of explicit instruction, sensitive and warm interactions, responsive feedback, and verbal engagement/stimulation intentionally directed to ensure children's learning while embedding these interactions in a classroom environment that is not overly structured or regimented. These aspects of instruction and interaction uniquely predict gains in young children's achievement, have been directly tied to closing gaps in performance, and are endorsed by those who advocate tougher standards and more instruction and by those who argue for child-centered approaches. But unlike for older children, to be effective, teachers of young children must intentionally and strategically weave instruction into activities that give children choices to explore and play, engage them through multiple input channels, and should be embedded in natural settings that are comfortable and predictable. The best teachers are opportunists – they know child development and exploit interests and interactions to promote it – some of which may involve structured lessons and much of which may not.

Interactions with teachers determine the value of enrollment in preschool and contribute to closing performance gaps. As one example, we examined whether children at risk of early school failure exposed to high levels of observed instructional and emotional support from teachers would display higher achievement than at-risk peers not receiving these supports. Two groups of children were identified: those whose mothers had less than a 4-year college degree and those who had displayed significant behavioral, social and/or academic problems, who, on average, were behind their peers at age four and further behind by first grade. Yet if placed in classrooms in which teachers demonstrated the type of interactions described above these gaps were eliminated: children from low-education households achieved at the same level as those whose mothers had a college degree and children displaying prior problem behavior showed achievement and adjustment levels identical to children who had no history of problems.

These results are consistent with a cluster of experimental and well-designed natural history studies that show a return to achievement from observed classroom quality of between a half to a whole standard deviation on standardized achievement tests, with greater effects accruing to children with higher levels of risk and disadvantage. Experimental studies, although few and involving far fewer children, show similar effects. In fact, findings are almost uniform in demonstrating significant and meaningful benefits for enrollment in early education settings in which teacher-child interactions are supportive, instructive, and stimulating. Yet these "effects" studies do not provide information on the prevalence and distribution of such "gap closing" classrooms within the system of early education and care, or how to produce gap-closing settings.

Quality is less available than you think

Unfortunately, the odds are stacked against children getting the kind of early education experiences that close gaps. Observational studies including several thousand settings, indicate that young children are exposed to moderate levels of social and emotional supports in their Pre-K, K, 1st and 3rd grade classrooms and quite low levels of instructional support—levels that are not as high as those gap-closing, effective classrooms described above. The quality of instructional interactions, particularly the dimensions that appear to matter most for children's achievement, is particularly low (the average levels hover around a "2" on a seven-point scale).

In addition to somewhat low levels of instructional support, in nearly every study that includes a large number of classrooms, there is also an exceptional degree of variability in the opportunities that appear to contribute to increased performance. Observations that include several thousand child care settings, pre-k, kindergarten and first grade classrooms show that some children spending most of their time engaged in productive instructional activities with caring and responsive adults who consistently provide feedback, challenges to think, and social supports. Yet for others, *even in the same program or grade*, most of their time is spent passively sitting around, having few if any interactions with an adult, watching the teacher deal with behavior problems, exposed to boring and rote instructional activities. In some programs, even in classrooms right next to one another that share the same materials and curriculum, the exposure of children to high quality learning and social supports is so dramatically different that one would conclude the difference was planned. Children in some classrooms may be exposed to few, if any, instances of any form of literacy-focused activities, whereas in others children received more than an hour of exposure to literacy-related activities, including narrative story-telling, practice with letters, rhyming games, and listening.

Drawing from the very large sample of state-funded pre-k classrooms in the NCEDL study, we used the statistical procedures of multi-stage cluster analysis to group similar classrooms together as a way of profiling this sector of American education (the NCEDL sample represents 80% of pre-k programs serving 4-year olds in the US). They show that only about 25% of pre-k classrooms show high levels of emotional and instructional support—the type of classroom setting almost universally described as high quality (this is not unique to pre-k; we find the same rates in first and third grade). Even further troubling is evidence that the preschooler lucky enough to experience a pre-k classroom likely to contribute to achievement is unlikely to be enrolled in a similarly high quality, gap-closing classroom in kindergarten or first grade. Rather it appears that exposure to gap-closing classroom quality, although highly desirable from nearly every perspective imaginable, is a somewhat random and low prevalence event that is even more unlikely for children in poverty.

These realities about the level and distribution of high quality early education classrooms in the United States probably reflect the convergence of at least three factors. First, teaching young children is uniquely challenging and is not easy. Second, many of the publicly-funded early education programs that are included in large-scale studies (such as Head Start and state pre-k) are composed of a high percentage of children who live below the poverty line who can bring with them a collection of features that make teaching even more challenging, especially when concentrated in a classroom. Third, the system of early education operates on a shoestring of support and is not at all aligned with k-12—it is often less well-funded than k-12, classrooms are housed in trailers or makeshift locations, and teachers tend to not use the same curricula, assessments, or approaches to teaching across these years. There is no systematic approach to connecting preschool – what takes place for 3 and 4 year olds – with early elementary school –

and so we lose much of the potential leverage for early education impacts on later learning and achievement simply by the way the system is (not) designed.

Professional development to improve teacher effectiveness and early education impacts 3-3rd

Too few of the students who are in greatest need of effective teaching in their early education experiences receive them and the few that do are unlikely to receive them consistently, making it unlikely that the positive effects will be sustained for children who need consistent supports.

These findings should spark an interest in raising and leveling the quality of classroom supports available to young children across the ages of 3-8—this is truly a critical period for learning skills required later. One option is to focus on structural features of schools and classrooms such as teacher education and certification, class size, and curriculum and enact policies to ensure that these proxies for quality are uniformly in place. The available data do not provide compelling support for this option, although it should not necessarily be discarded altogether. Another option is to aim regulation and support at what teachers do in classrooms as they interact with children and find ways to more directly change and improve the dimensions of instructional and social interactions teachers have with children in large numbers of classrooms.

A first step in that direction would be more systematic, objective, standardized descriptions of such interactions and professional development and training systems for teachers that actually support them to interact more effectively with their students. Ultimately, such systems, if based on strong and valid metrics, may be a more cost-effective mechanism for effecting real change for teachers and children in part because rather than focusing personal and financial resources in the pursuit of *proxies* that show little relation to teacher quality and child outcomes, such a system could be organized around direct assessments of teacher/classroom quality shown to be related to children's outcomes. Increasingly there are tools to help facilitate progress toward this goal. Observational measures such as those we have developed – the Classroom Assessment Scoring System, or CLASS – and those used in other large-scale applications, that focus on standardized observation of instruction, are reliable and valid measures, directly linked to improvement in student outcomes. These tools, spanning the 3-3rd period could form the basis of strategic scientifically-based development of a new generation of professional development and policy initiatives aimed at increasing educational opportunity by forming a coherent and consistent view of teaching and learning across these ages, one predicated on an understanding of how young children learn through interactions with adults.

Others and we are innovating with technologies for conducting classroom observation at-scale. It may be quite feasible to imagine a system of program development and improvement teachers/classrooms can be observed on an annual basis using an instrument that assesses dimensions of classroom experience that contribute to child achievement.

More important than being able to observe and measure social and instructional interactions in classrooms is to design and test models for improving these opportunities to learn. What is emerging, through more systematic evaluations of professional development programs that are closely linked to classroom practice, such as mentorship and coaching, is that direct training and constructive feedback and support to teachers based on observation of their interactions with children in classrooms yield promising results for improving early education practice and children's performance. Challenges remain in how to further develop, validate, and scale-up such approaches, but the science of early education holds considerable promise for advancing these possibilities.

For the early childhood education system to move toward the goal of active and marked advancement of children's skills and competencies, the quality and impacts of programs must be improved through a vertically and horizontally integrated system of focused professional development and program designs/models that are educationally focused (as described earlier). In short, programs themselves need to re-align around educational aims (in key developmental domains and appropriately articulated) and teachers must receive preparation and support to deliver classroom experiences that foster those aims more directly. Teaching would entail providing teacher-student interactions that promote the acquisition of new skills, delivers curricula effectively, and individualizes instruction/interaction based on children's current skill level, background, and behavior. Programs require (and policy should incent use of) proven-effective professional development supports through which teachers would acquire the skills in effective teacher-child interactions and implementation of curricula and assessment in developmentally-synchronous ways.

Improvement of early education impacts rests on *aligning professional development and classroom practices with desired child outcomes*. In particular, the field needs a menu of professional development inputs to teachers (pre-service or in-service) that are proven to produce classroom practices (e.g., teacher-child interactions) that in turn result in the acquisition of desired skills among children (e.g., literacy skills). Efforts to develop such a system of aligned, focused, and effective professional development for the wide-ranging early childhood workforce are underway through the auspices of the Department of Education-funded National Center for Research on Early Childhood Education (NCRECE) and by several other investigators, which target children's early literacy and language development, and mathematics.

Targeted intervention to improve teacher interactions with children and instruction in academic skills such as the NCRECE My Teaching Partner approach does increase effective teaching and children's social and academic gains. Other research groups have demonstrated similar results—that coaching teachers in interactions that are linked to instructional supports for learning and good implementation of curriculum can have significant benefits for children. Mentoring and training are 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 assistance providers.

Professional development approaches optimally should be designed for "high-priority" skill targets, such as preschool language and literacy or math, and start with defining these targets and ensuring that there is a curriculum in place that reflects these targets. A high priority target for literacy or math instruction is one that (a) is consistently and at least moderately linked to school-age achievement, (b) is amenable to change through intervention, and (c) is likely to be under-developed among at-risk pupils. It is clear that increasing teachers' knowledge of developmentally relevant skill progressions can be a key aspect of improving their instruction and child outcomes yet teacher also require dedicated attention to implementing that knowledge through their interactions in the classroom.

An innovative web-based professional development treatment for improving school readiness. Because effects of organized curricula on children's skills are mediated and/or moderated by teacher-child interactions, these interactions must be a *central focus* of PD interventions aiming to improve child outcomes. The average pre-k-3 child experiences teacher-child interactions of mediocre-low quality, but small increments produce skill gains.

MyTeachingPartner (MTP) Coaching focuses on improving teacher-child interactions defined and measured by the CLASS. Because the majority of teachers' interactions fall below the threshold levels *most preschool classrooms do not operate in the "active range*;" small incremental improvements are associated with meaningful changes in children's skills. Importantly, MTP is capable of moving teacher-child interactions into (and through) the range in which they improve children's readiness.

For example, the improvements yielded from MTP were substantial. MTP coaching of teachers improved their interactions and instruction and closed the achievement gap in literacy and language development for poor children by almost a third. Coaching was delivered to teachers *entirely through the web*; this is perhaps one of the first completely web-based professional development approaches that is effective, individualized, and improves teacher-child interactions across any curriculum. And the use of the web in this and other novel and effective approaches to professional development affords potential for scalability and cost-savings for travel, and location is not a precondition to individualized feedback to teachers. To illustrate, MTP is among the least expensive professional development for teachers for which cost has been documented with effects larger than those typically reported in the literature. And MTP and other web-mediated approaches can be aligned with training, certification, and degree requirements for teachers.

The best approaches to professional development focus on providing teachers with developmentally-relevant information on skill targets and progressions and support for learning to skillfully use instructional interactions, and effectively implement curricula. These approaches *align* (conceptually and empirically) the requisite knowledge of desired skill targets and developmental skill progressions in a particular skill domain (e.g., language development or early literacy) with extensive opportunities for a) *observation* of high quality instructional interaction through analysis and viewing of multiple video examples, b) *skills training* in identifying in/appropriate instructional, linguistic, and social responses to children's cues, and how teacher responses can contribute to student literacy and language skill growth, and c) repeated *opportunities for individualized feedback* and support for high-quality and effectiveness in one's own instruction, implementation, and interactions with children. This is a system of professional development supports that allow for a direct tracing of the path (and putative effects) of inputs to teachers, to inputs to children, to children's skill gains.

Again, evidence is very promising that when such targeted, aligned supports are available to teachers, children's skill gains can be considerable, on the order of a standard deviation. Unfortunately, preschool-grade 3 teachers are rarely exposed to multiple field-based examples of objectively-defined high quality practice and receive few if any opportunities to receive feedback about the extent to which their classroom interactions and instruction promote these skill domains. And at present, there is also very little evidence that the policy frameworks and resources that should guide and incent professional development and training of the early education workforce actually are aligned with the most promising, evidence-based forms of effective professional development. Thus there is little wonder that teachers with a four-year degree or two-year degree do not differ from one another substantially in either their practice or students' learning gains, or that investments in courses and professional development appear to return so little to children's learning. It truly does "depend" on the nature and type of professional development and future considerations for policy aimed to improve the quality and effects of preschool must very clearly address this disconnect and make investments in

professional development far more contingent on what we know is beneficial to teachers and children as opposed to convenient or beneficial to professional development providers.

Summary and conclusions

The conclusions are fairly straightforward. First, early educational opportunities in this country are a non-system. Publicly supported early education programs (child care, Head Start, state-funded pre-kindergarten, k-3) encompass such a wide range of funding streams and targets, program models, staffing patterns and qualifications, curriculum, assessments, and teacher capacities that it cannot be understood as an organized aspect of the public system of support for children. This is unfortunate because evidence is so clear the opportunities to learn, and learning that takes place, in this age range are simply more important than at other ages, for the long-term well-being of individuals, families, and communities.

Second, despite this stunning variability and fragmentation, there is compelling evidence from well-controlled studies that early educational experiences can boost development and school readiness skills, can close achievement gaps in elementary school, and can have longer-term benefits to children and communities over time. Unfortunately, the effects of various program models are quite varied, with some rather weak and ineffective while other scaled-up programs narrowing the achievement gap by almost half. And it is quite clear that programs that are more educationally-focused and well-defined produce larger effects on child development.

Third, for children enrolled in preschool, features of their experience in those settings matter – particularly the ways in which teachers interact with them to deliver developmentally stimulating opportunities. The aspects most often discussed as features of program quality regulated by policy (such as teacher qualifications or curriculum) have much less influence on children than is desired and their influence pales in comparison to what teacher actually do with children. Critically important, interactions between teachers and children can be observed and assessed using standardized and scalable approaches (as is evident in the use of CLASS in Head Start and many school districts). Unfortunately, when assessed in this manner, it is evident that most early education classrooms fall short on teachers' demonstrating gap-closing interactions. Finally and perhaps most promisingly, teachers' skills and children's learning can be improved with specific and focused professional development training and support.

If effective models of professional development can indeed change child outcomes, then the potential for scaling and building incentive and policy structures around these models becomes an important feature of systemic improvement and policy. The recent development and expansion of Quality Rating and Improvement Systems in early childhood are one such example of a set of policy initiatives that integrate measurement of inputs and outcomes with incentives and resources for teacher improvement.

Finally, one might also envision professional preparation and credentialing models based on what we are learning from studies of effective professional development and its evaluation. To the extent that these models of support and education for teachers can be demonstrated to produce gains in teacher competencies that produce child outcome gains, then it seems critical to build such opportunities for professional preparation "back" into the "pre-service" sector and to find methods for credentialing and certifying teachers on the basis of participation in effective professional development and demonstration of competence. In fact, new policy statements related to professional development and career development being suggested by the National Association for the Education of Young Children explicitly identify teachers' performance in classroom settings, specifically their interactions with children, as a dimension of career advancement that should be credentialed and tied to professional development. Such statements

by professional organizations reflect openness to innovation that, paired with demonstrably effective supports for teachers, could pave the way for tremendous positive change in outcomes for teachers and children.

In an era of high-stakes testing in which even *young children* may be held to uniform, minimum performance standards, it is disconcerting to note that the system on which the nation is relying to produce such outcomes provides exceptional variability in the nature and quality of actual *opportunities to learn*. It seems unreasonable to expect universal levels of minimal performance for students when the opportunities in early education are so unevenly distributed. As the system of early education serving children from 3-8 in the United States evolves as an integral component of the solution to a host of problems related to schooling and achievement, serious attention is needed to policies, particularly for teachers and their professional development and support, that help re-design this portal into public education in terms of aligned, effective experiences in classrooms that indeed foster children's learning and development.