Professional Development in Early Childhood Intervention : Where We Stand on the Silver Anniversary of PL 99-457

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Professional Development in Early Childhood Intervention:

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We describe historical foundations of professional development (PD) in early childhood intervention (ECI) and where we stand on the silver anniversary of PL 99-457. To advance its scientific basis, we assert that it is important to define what is meant by PD; identify structural and process features of PD hypothesized to be effective for supporting improvements in intervention quality and effectiveness; specify theories of action or change related to how specific features of PD are assumed to affect practitioner behaviors and, in turn, child or family outcomes; and conduct experimental studies that provide evidence to support or refute specified theories of action. We describe progress being made in each of these areas and discuss several challenges and future directions related to advancing the scientific basis of PD in ECI.

Keywords: *professional development; early childhood intervention; historical foundations; empirical research in professional development*

Twenty-five years after the passage of PL 99-457, the field has an important opportunity to advance the scientific basis for professional development (PD) in early childhood intervention (ECI). PD is receiving significant attention by researchers, policy makers, and practitioners as demands for qualified early childhood (EC) practitioners have increased and the body of knowledge has grown about dimensions of program quality and effective practices that are associated with desired child and family outcomes (Snyder, Denney, Pasia, Rakap, & Crowe, 2011). EC PD is currently a "wired" topic (Odom, 2009), particularly given hypothesized relationships among high-quality PD, intervention quality, and intervention effectiveness. Along with administrative support, PD has been identified as an important

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"driver" to support practitioners' implementation of evidence-based practices and to improve developmental and learning outcomes of young children. Against this backdrop, the need to advance the scientific basis for EC PD has been recognized both in EC (e.g., Ramey & Ramey, 2007; Sheridan, Edwards, Marvin, & Knoche, 2009; Zaslow, 2009) and in ECI (e.g., Bruder, Mogro-Wilson, Stayton, & Dietrich, 2009; Buysse & Hollingsworth, 2009; Snyder, Denny, et al., 2011; Winton & McCollum, 2008).

What does it mean to advance a scientific basis for PD in ECI? At a minimum, it involves (a) defining what is meant by PD; (b) identifying structural and process features of PD hypothesized to be effective for supporting improvements in intervention quality and intervention effectiveness; (c) specifying theories of action or change related to how specific features of PD are assumed to affect practitioner knowledge, skills, or dispositions and, in turn, child or family outcomes; (d) conducting experimental studies that provide evidence to support or refute specified theories of action; and (e) analyzing the active ingredients or components of the PD interventions that are evaluated.

Advancing the scientific basis for ECI PD goes beyond case studies that describe PD interventions or studies that examine associations between practitioner attributes (e.g., levels of education, types of certifications or credentials achieved) and their knowledge, skills, and dispositions. In addition, those committed to advancing a scientific basis for ECI PD acknowledge a need to move beyond "main effect" questions (e.g., Is PD effective?). Similar to second-generation research on early intervention effectiveness, to advance a scientific basis for ECI PD, it will be important to explicate what PD is and which features of PD work for whom, under what circumstances, and at what cost.

In the present article, we provide an abbreviated history of PD in ECI, particularly with respect to changing definitions and conceptualizations since the passage of PL 99-457. This historical account is followed by discussion about where we stand in relation to advancing a scientific basis for ECI PD.

Historical Contexts for ECI PD

The theoretical and conceptual roots of contemporary ECI PD practices are deep even though empirical roots have been acknowledged to be somewhat shallow. Many recommended ECI PD practices emanate from foundational applied behavior analytic principles related to learning and teaching (e.g., Catania, 2006; Greer, 2002), from adult learning theory (e.g., Knowles, 1980, 1990), from models for improving staff performance through training and performance feedback (Crow & Snyder, 1998; Joyce & Showers, 2002; Snyder & Wolfe, 2008), and from models and practices used in elementary and secondary education PD. In addition, legislation, including PL 99-457, has influenced ECI PD practices. These influences include both initial preparation practices (often referred to as preservice training) and practices associated with ongoing education or learning experiences designed to support, improve, or change practice (historically referred to as in-service training).

To situate the historical review of ECI PD, we use labels that have been applied to characterize stages of teaming: (a) forming, (b) storming, (c) norming, and (d) performing (Tuckman, 1965). We assert that to advance a scientific basis for ECI PD, systematic

attention should be focused on norming and performing, while recognizing that recursive cycles of forming, storming, norming, and performing will occur as contextual influences shift and evidence accumulates from research.

Forming: Personnel Preparation and Comprehensive Systems of Personnel Development (CSPD)

From 1986 to 1991 (the 5-year period during which early intervention and preschool programs were to be designed and subsequently implemented under PL 99-457), emphasis was focused on CSPD that addressed two major issues: specifying standards for ECI personnel and developing a "comprehensive" system that would support personnel to achieve the standards. The terms *personnel preparation* and *personnel development* appeared frequently in the extant literature and most definitions of personnel development included reference to both preservice training and in-service training (see Bailey, 1989). Other components of CSPD included technical assistance and dissemination activities. For the early intervention (birth to 3) program, there was explicit recognition that personnel standards and personnel development systems had to accommodate the interdisciplinary, team-based, and family-centered focus of the field.

Significant efforts were devoted during this period to identifying core, professional discipline, and specialized competencies to inform preservice and in-service personnel preparation activities carried out as part of the CSPD (Thorp & McCollum, 1988). Core competencies reflected knowledge, skills, or dispositions that were important for any practitioner working in ECI (e.g., child development, assessment, teaming, family-centered practices). Professional discipline competencies were statements of knowledge, skills, or dispositions associated with a particular discipline (e.g., speech-language therapy, EC special education, or occupational therapy) and specialized competencies represented knowledge, skills, or dispositions associated with a particular discipline that focused on birth to 5 years (e.g., skills related to the practice of physical therapy when providing supports and services to infants, toddlers, and preschoolers).

Specification of competencies was important for establishing the "identity" of practitioners from a variety of disciplines who were working in ECI and for describing what these practitioners should know or be able to do. These competencies helped inform the content focus of preservice and in-service activities included in the CSPD. In addition, significant federal investments were made during this time under the discretionary grant programs associated with PL 99-457 to support ECI personnel preparation (both preservice and in-service), technical assistance, and dissemination activities.

During the forming years, the Carolina Institute for Research on Infant Personnel Preparation at the University of North Carolina at Chapel Hill conducted a series of survey studies to characterize the extent to which preservice and in-service personnel preparation programs were addressing core or specialized competencies. For preservice programs, investigators found significant variability within and across disciplines in the curriculum content coverage aligned with core and specialized competency areas (Bailey, Simeonsson, Yoder, & Huntington, 1990). In addition, faculty associated with most preservice programs indicated that they did not plan significant increases in early intervention content in their programs, despite the passage of PL 99-457 and its personnel preparation requirements.

With respect to in-service training as part of the CSPD, studies conducted as part of the institute and by others suggested that in-service education was characterized largely by a "crisis mentality" with efforts focused on training large numbers of individuals rapidly to meet workforce demands (Winton, 1990).

When the early intervention and preschool programs authorized under PL 99-457 were fully "launched" in 1991, practitioners qualified and competent to provide services and supports to young children with disabilities and their families generally were in short supply. Perhaps this is one reason many personnel preparation activities during the initial years following the passage of PL 99-457 focused on training large numbers rapidly. The quality of in-service training that was available, however, was characterized as uneven, unpredictable, and generally ineffective with respect to intended outcomes (Winton, McCollum, & Catlett, 1997).

Storming: Reforming ECI Personnel Preparation

Based on lessons learned during the initial years of developing and implementing CSPD, beginning in approximately 1991 and continuing through several successive reauthorizations of PL 99-457, a bold premise was put forth that early intervention personnel preparation needed to be reformed. In a 21-chapter edited text focused on this premise (*Reforming Personnel Preparation in Early Intervention: Issues, Models, and Practical Strategies*; Winton et al., 1997), leaders in the field examined personnel preparation from an ecosystemic perspective and identified critical content and process components needed to advance practices.

During this time, personnel preparation was defined somewhat loosely and broadly. The definition included "strategies" such as mentoring, consultation, case method of instruction, guided decision making, and "processes" such as personnel standards, licensure, certification, competencies, and monitoring to "create a community of learners with the capacity to grow and develop in the face of ongoing changes in the field" (Winton et al., 1997, p. xv).

Important issues related to the need to define and evaluate the quality of personnel preparation practices were raised during this time, with growing recognition that policy makers and funding agencies were interested in proximal (practitioner) and distal (child and family) outcomes resulting from investments being made in personnel preparation. No longer were counts of the number of individuals trained, hours of training provided, and satisfaction measures sufficient forms of data to characterize the quality of personnel preparation (Snyder & Wolfe, 2008). In addition, there was growing recognition that training large number of practitioners rapidly and "hoping" for knowledge acquisition and skill application without systematic support or follow-up was unlikely to be a meaningful catalyst for significant improvements or changes in intervention practices.

Attention during this time was directed toward identifying promising instructional or pedagogical models or strategies that would reform personnel preparation practices and support individual practitioners or groups of practitioners to demonstrate competence and confidence in identified competency areas. The general education and adult learning literature suggested that personnel preparation reform efforts (particularly "in-service training" or "staff development") needed to incorporate underlying assumptions about individual and

systemic change. Among these assumptions were the following: (a) Change involved comprehensive and long-term approaches (e.g., episodic or one-shot workshops were unlikely to effect practice change); (b) practitioners needed to recognize the discrepancies between their current and desired knowledge, skills, and dispositions reflected in specified competencies; (c) individuals within organizations needed to participate together in personnel preparation to develop shared knowledge, skills, dispositions, and motivations for changes in roles and practices; and (d) "consumers" should be empowered to make decisions about their personnel preparation needs and strategies for addressing those needs (Miller & Stayton, 1996).

Several reform models that focused on interdisciplinary, family-centered, team-based approaches were developed and validated during this time, largely using descriptive research methods. For example, Bailey and colleagues specified a team-based model for change characterized as "a decision-making model that provides early intervention teams [including families] with a structure and framework for becoming more family-centered in their work" (Bailey, McWilliam, & Winton, 1992, p. 74). In addition, a number of descriptive characterizations of preservice and in-service programs appeared in the literature. These descriptions offered relevant and instructive information about program content and processes, but little comparative research data were available to guide the specification of recommended practices in ECI personnel preparation (Miller & Stayton, 1996; Winton et al., 1997).

Although data specific to ECI generally were lacking, findings from several influential meta-analyses were used to support the premise that the structure and format of ECI personnel preparation should be aligned with desired training outcomes (Showers, Joyce, & Bennett, 1987; Wade, 1984/1985). Moreover, these meta-analyses helped to identify potentially efficacious components of staff development (in-service) programs designed to result in implementation in practice contexts. Among the components identified were (a) clear objectives, (b) presentation of theory or information about skills to be acquired or mastered, (c) demonstration and modeling of skills, (d) opportunities to practice skills under simulated or in real contexts, (e) feedback about implementation of skills in practice contexts, and (f) follow-up coaching to support implementation and adaptations to implementation in practice contexts.

By extrapolating from their meta-analytic work, Joyce and Showers (2002) predicted the percentage of participants likely to attain outcomes of knowledge, skill, or transfer ("executive implementation") when these identified components of staff development were used. Table 1 shows these data. It is important to note that Joyce and Showers acknowledged that the estimates shown in Table 1 were somewhat rough (given identified methodological limitations associated with the research they reviewed). Nevertheless, their work and the work of other researchers helped inform "reform" efforts that were occurring in ECI personnel preparation, particularly efforts focused on examining the nature and extent of systematic "follow-up" strategies such as coaching and mentoring that might show promise for supporting practice implementation.

The forming and storming phases provided an important foundation for building and advancing the scientific basis for ECI PD. These phases set the stage for norming and performing to define and conceptualize PD more rigorously and examine empirically the key components (e.g., systematic follow-up).

Table 1
Professional Development (PD) Components and Attainment of Outcomes in Terms of Percentage of Participants

	Participants attaining professional development outcomes		
Components of PD	Knowledge (%)	Skill (%)	Transfer (executive implementation) (%)
Presentation of theory and content	10	5	0
Plus demonstration and modeling	30	20	0
Plus practice with feedback	60	60	5
Plus coaching for implementation in practice context	95	95	95

Note: Adapted from "Student Achievement Through Staff Development," by B. Joyce and B. Showers, 2002, p.78. Copyright 2002 by the American Society for Curriculum and Development.

"Norming": Defining PD

By 2000, the field had established a set of empirically informed and validated recommended practices related to ECI and to ECI personnel preparation based primarily on descriptive, preexperimental, and single-subject experimental ECI PD research and lessons learned during forming and reforming (Dinnebeil, Miller, & Stayton, 2002; Sandall, McLean, & Smith, 2000). Although acknowledging that more research and less speculation were needed to inform recommended practices in personnel preparation, it is noteworthy that an initial set of practices were specified. These practices were informed by principles (knowledge derived from empirical research), maxims (accumulated wisdom), and norms (propositions based on custom or tradition).

At about the same time that recommended ECI personnel preparation practices were released to the field, the No Child Left Behind (NCLB) Act of 2001 was codified and "rebranded" what had been known for many years as the Elementary and Secondary Education Act. Significant for ECI personnel preparation, the term *professional development* (PD) was used in the Act to refer to comprehensive, sustained, and intensive approaches to improving teachers' and principals' effectiveness in raising student achievement. Important activities associated with PD were specified explicitly in the Act (§9101 34 p. 1963), including features of PD such as (a) sustained; (b) intensive; (c) participative; (d) classroom focused; (e) aligned with content standards, achievement standards, and assessments; (f) informed by scientifically based research; (g) evaluated for impact; (h) planned for diverse populations, including limited-English-proficient children and children with special needs; and (i) focused on the use of data and assessments to inform instruction. Of significance, one-day or short-term workshops or conferences were specifically identified as *not* meeting the definition of PD.

In addition to NCLB, several EC organizations or groups specified standards or recommended practices for PD (e.g., Miller & Stayton, 2005; National Association for the Education of Young Children, under revision). Across organizations and groups, several consistent features of PD were cited. These included (a) sustained over time, (b) grounded in practice (job embedded), (c) linked to curriculum and instructional goals, (d) collaborative,

(e) interactive, and (f) the provision of implementation supports and feedback in practice settings.

Data gathered in close proximity to the specification of these "normative" features suggested, unfortunately, that most ECI practitioners were not participating in enlightened PD that included these features. For example, findings from survey studies conducted by the Center to Inform Personnel Preparation Policy and Practice in Early Intervention and Preschool Education (2007a, 2007b) revealed that only 39% of Part C programs and 58% of Section 619 preschool programs reported having systematic, sustainable approaches to PD. Only 23% of Part C and 42% of Section 619 programs had comprehensive technical assistance systems in place to support ongoing PD (Bruder et al., 2009). Of the 20 states that reported having formal PD systems in place, the majority offered training primarily through workshops (n = 19) or through distance learning (n = 16). Even fewer states (n = 12) reported they implemented follow-up activities after workshops or training. While acknowledging that state-level data might not provide a complete picture of PD being experienced by ECI practitioners, Campbell and Sawyer (2009) noted that most national surveys have documented practitioners' reports of conference or workshop attendance as the most frequent form of PD they experience. Most disconcerting, despite a large body of anecdotal literature, federal policies, and accumulating empirical evidence about "effective" PD, the data reported by Bruder et al. (2009) suggested that few ECI practitioners were receiving systematic implementation support using promising PD practices such as coaching, mentoring, or consultation.

Performing: Advancing the Scientific Basis of ECI PD

Most recently, efforts have shifted to "performing" or advancing the scientific basis for ECI PD by conducting experimental evaluations of EC PD interventions. The need for this shift has been highlighted in the general education literature (e.g., Yoon, Duncan, Lee, Scarloss, & Shapley, 2007) and in the EC literature (Sheridan et al., 2009).

Accumulating empirical evidence as summarized in several reviews of the literature (e.g., Kennedy, 1998; Yoon et al., 2007) is helping to validate promising features of effective PD described in earlier decades. In addition, empirical investigations are being conducted that are focused on "unpacking" active ingredients of PD hypothesized to be associated with instructional quality and instructional effectiveness (e.g., Buysse, Castro, & Peisner-Feinberg, 2010; Landry, Anthony, Swank, & Monseque-Bailey, 2009; Powell, Diamond, Burchinal, & Koehler, 2010; Wasik & Hindman, 2011). Guidance has been offered in the general education literature about motives and methods for "experimenting" with teacher PD (Wayne, Yoon, Zhu, Cronen, & Garet, 2008) that are informative for experimental evaluations of ECI PD interventions.

Specific to EC PD, Sheridan et al. (2009) and Zaslow (2009) have emphasized the need to describe with greater specificity the active ingredients associated with effective PD (effective being defined as having impacts on interventionist practice and child or family outcomes). This shift will likely necessitate changes in how the field operationally defines PD, specifies theories of action or change related to PD interventions, and shares information about rigorous evaluations of PD interventions. To date, most empirical reports of EC PD focus primarily on describing structural features of the intervention (including type or

form of PD, content focus, and some information about dose) but specifying limited information about the mechanisms hypothesized to be associated with proximal or distal outcomes, including sufficient and replicable descriptions of the key ingredients of the PD intervention (Snyder, Hemmeter, et al., 2011). In addition, some studies do not measure distal (child or family) outcomes. Thus, limited empirical research exists to guide policy makers and practitioners about the "ingredients" of PD that demonstrate the most promise for supporting EC practitioners to acquire background knowledge and implement instructional strategies that lead to improved child or family outcomes.

Snyder, Hemmeter, and colleagues (2011) conducted a systematic descriptive review of the EC PD literature that included 256 studies published from 1970 through January 2011. Studies included in the review were from EC and ECI. These researchers found that the most frequent type (form) of PD reported in the studies was in-service training (i.e., training removed from participants' work context; 33.6%), followed by staff development (i.e., on-site training to an individual or group who work together in a center, program, or agency; 28.1%), preservice training (19.9%), in situ consultation or coaching (15.6%), or other type of PD (e.g., web-training, mentoring, training materials provided; 11.5%).

Of the 256 studies reviewed, 159 studies reported that some type of systematic follow-up support was provided either after a workshop or training (e.g., coaching following workshops) or systematic support was the PD (e.g., behavioral consultation, coaching without workshops). Although 90% of the studies listed the type (form) of support strategies used and 98% of the studies identified who provided follow-up, only 59% of the studies reported the duration of support provided, only 66% reported the frequency of support provided, and only 46% reported the length of a support session. Moreover, only 26% of the studies reported using a protocol, script, or rubric to guide the implementation of the systematic support and only 19% reported the fidelity with which the systematic support was implemented. Findings from the descriptive review by Snyder, Hemmeter, and colleagues (2011) are consistent with Sheridan et al.'s (2009) assertion that most published EC PD studies to date do not include sufficient and replicable descriptions of key ingredients of the PD intervention nor do they provide data about whether the PD intervention components were implemented as intended. These findings suggest the need for operational definitions of PD intervention components, descriptions of whether and how systematic implementation support was provided, and measurement of PD implementation fidelity.

An additional finding from the review by Snyder, Hemmeter, and colleagues (2011) demonstrated increasing momentum toward more studies and more rigorous experimental examinations of EC PD in recent years. Table 2 shows the number of studies included in the review by their publication date, grouped in relation to periods before and after the passage of PL 99-457. The table shows that the number of published studies focused on the EC PD before 1986 was 16 and from 1986 through January 2011 was 240. Trends related to systematic follow-up show that most systematic follow-up conducted before 2006 was not implemented in the context of randomized group experimental designs. In addition, Table 2 shows that 27 randomized group experimental design studies have been conducted between 2006 and February 2011 versus none prior to 1991.

Despite shortcomings and challenges identified in the current EC PD literature, important steps are being taken related to what will be needed to advance a scientific basis for ECI PD. Each of these steps will be discussed briefly below.

Table 2
Frequency of Early Childhood Intervention (ECI) Professional Development (PD) Studies With Systematic Follow-up Component and Type of Research Method by Period

Year of publication	Studies published related to ECI PD[a]	Studies with systematic follow-up PD component[b]		Research method[c] used (n = 159)					
		n	%	Exp.	Quasi exp.	Pre exp.	Single-subject exp.	Qual.	Other[d]
1970-1975	4	2	50	—	—	1	1	—	—
1976-1980	3	0	—	—	—	—	—	—	—
1981-1985	9	3	33	—	—	2	1	—	—
1986[e]-1990	15	9	60	—	1	3	4	1	1
1991-1995	28	16	57	2	2	3	6	—	3
1996-2000	34	14	41	3	1	3	4	2	2
2001-2005	52	30	58	5	4	5	9	5	5
2006-2010	108	82	76	26	11	23	15	10	3
January 2011[f]	3	3	100	1	—	—	1	1	—
Total	256	159	62	37	19	40	41	19	14

Note: Data from systematic literature review used with permission from "Early Childhood Professional Development: Categorical Framework and Systematic Review of the Literature," by P Snyder, M. L. Hemmeter, K. Artman, K. Kinder, C. Pasia, and T. McLaughlin, 2011.

[a]ECI PD included studies about professional development for practitioners working with children birth through 5.
[b]Articles were categorized as having systematic follow-up if PD included or was followed by coaching, behavioral consultation, mentoring, peer support groups, or communities of practice.
[c]Research methods were identified as experimental (exp.), quasi experimental (quasi exp.), preexperimental (pre exp.), single-subject experimental (single-subject exp.), qualitative (qual.), and other. Some studies used qualitative research methods in combination with another method.
[d]Other includes nonexperimental, case study, and model demonstration.
[e]1986 marks the passage of PL 99-457.
[f]Article search includes studies published through January 2011.

Defining ECI PD. Until recently, no shared definition for EC PD existed (Maxwell, Feild, & Clifford, 2006; National Professional Development Center on Inclusion [NPDCI], 2008). To advance efforts related to developing a shared definition, investigators associated with the NPDCI developed and disseminated the following definition: "Professional development is facilitated teaching and learning experiences that are transactional and designed to support the acquisition of professional knowledge, skills, and dispositions as well as the application of this knowledge in practice" (NPDCI, 2008, p. 3). The NPDCI also developed and disseminated a conceptual framework to accompany the definition that emphasizes three key features of ECI PD: the *who (i.e., learner)*, the *what (i.e., the content)*, and the *how (i.e., the facilitation of PD)*. In addition, the framework specifies important infrastructure and contextual supports for EC PD. Of particular importance for advancing the scientific basis for ECI PD, as Snyder, Hemmeter, et al. (2011) noted, this definition can be used to support the development, implementation, and evaluation of "second-generation" ECI PD that considers which transactional and facilitated teaching and learning experiences focused on what knowledge, skills, and dispositions are needed by which ECI practitioners and under what circumstances.

Identifying structural and process features of PD. Features of effective PD have been identified in empirical studies or systematic review of the literature primarily involving teachers working in K-12 education programs (e.g., Kennedy, 1998; Yoon et al., 2007). Features identified in this literature are likely relevant for advancing the practice of EC PD and its scientific basis by reminding researchers and those who design and deliver PD about structural and substantive features that should be considered. Garet, Porter, Desimone, Birman, and Yoon (2001) listed six features of effective PD organized by two dimensions: structural and substantive. Structural dimensions are PD form, duration, and collective participation. Substantive features focus on content, active learning strategies, and coherence. Many of these features are reflected in the NPDCI definition and framework and in the definition of PD found in NCLB.

Specifying theories of action or change. Hypothesized relationships between intervention components and desired outcomes are often specified in a theory of action or change. In 2008, Wayne and colleagues suggested that PD researchers should consider specifying two theories of action: a *theory of instruction* and a *theory of teacher/practitioner change*. Wayne et al.'s (2008) two-theory analogy might be useful for those who plan and implement ECI PD (see Snyder, Denney, et al., 2011, for an example application in ECI PD). A *theory of instruction* specifies hypothesized linkages among practitioner knowledge, skills, or dispositions emphasized in the PD (e.g., embedded instruction); practitioners' fidelity of implementation of teaching and instruction (proximal outcome); and child or family outcomes (distal outcomes). A *theory of teacher/practitioner change* specifies the components or active ingredients of the PD interventions hypothesized to be related to change in teacher knowledge or practice, including the structural and process mechanisms expected to be related to changes in teacher knowledge, skills, or dispositions (Snyder, Denney, et al., 2011; Wayne et al., 2008). Other implementation "drivers" such as amount of administrator support might also be specified in the theory of change (Snyder, McLaughlin, & Denney, 2011). Theories of change specified with these elements also help inform analyses of potential mediators and moderators of PD intervention effects.

Conducting experimental studies, analyzing active ingredients of the PD intervention, and examining costs. As noted previously, the number of published studies that involve rigorous experimental evaluations of PD interventions with EC practitioners has increased over the past 10 years. As these studies are published and findings are analyzed with respect to proximal and distal outcomes, it will be important to "unpack" the active ingredients of the intervention and to analyze structural and substantive features. For example, we need to know whether coaching is an active ingredient in most studies, and, if so, how coaching is defined and implemented. Evaluating whether and how coaching intervention fidelity was measured and examining coaching intervention intensity are important. To address second-generation questions related to what works for whom and under what circumstances, we need much clearer specifications about what "it" (the intervention) is and whether it was delivered as planned and with what intensity. In addition, we need to generate and compile cross-study estimates of PD intervention effects for both proximal and distal outcomes, particularly in relation to type and intensity of the active ingredients of the PD intervention.

Table 3
Number of Active Ingredients Specified in Select Studies in Randomized Control Trials ($N = 19$)

Active ingredients	No. of studies
College level course	3
Active learning strategies	3
Competencies	3
Video exemplars	3
Workshops or trainings	13
Active learning strategies	9
Video exemplars	2
Implementation supports/guides	5
Workshop strategies not reported	3
Live coaching	16[a]
Goal setting	5
Action planning	3
Observation	13
Modeling	9
Reflective or problem-solving conversation	7
Video exemplars	1
Performance feedback—Face-to-face	9
Live coaching strategies not reported	1
Web-mediated coaching	4[a]
Upload video of classroom practice (observation)	4
Reflection or self-journaling	3
Access to website with implementation supports and video exemplars	4
Performance feedback—web-mediated	4
Self-coaching *(self-guided coaching with web-based or print-based materials)*	0
Communities of practice	1

[a]One study included both a live coaching component and a web-mediated component, so live coaching and web-mediated coaching sum to 20 rather than 19.

Documenting costs associated with PD interventions will provide data useful for analyses focused on examining costs in relation to obtained effects and generate information likely to be useful for policy makers, program administrators, and PD providers.

To illustrate how the active ingredients of PD interventions used in randomized controlled experimental trials could begin to be analyzed, a descriptive analysis of 19 published trials that involved coaching as either the sole ingredient of the intervention or as a component of a multicomponent PD intervention is shown in Table 3. The data in this table show that only 5 of 16 studies involving live coaching explicitly described goal setting as a feature, despite the emphasis in most coaching models on goal setting. This is not to say that goal setting did not occur, only that it was not explicitly described as a component of the intervention. Without knowing if goal setting was used, it is difficult to evaluate whether this is a critical ingredient of live coaching, particularly in relation to obtained effects in the 11 studies that either did not use or did not report goal setting as a feature of coaching. Additional analyses similar to the one shown in Table 3, including those that relate intervention features to intervention effects and costs, would be very helpful for advancing the scientific basis for ECI PD.

Reaching the Golden Anniversary With a Strong Scientific Basis for ECI PD

As evidenced by the historical review and consideration of where we stand at 25 years, the field appears poised to spend the next 25 years "performing" in relation to advancing the scientific basis for ECI PD. Through a rich history and sustained and iterative work, the field has established a conceptual basis for PD, has refined definitions, and has an emerging evidence base to begin to understand what works for whom and under what circumstances. A variety of questions remain to be answered so we can continue to revise and deepen the conceptual, theoretical, and empirical bases that will guide intervention and research in this area through our golden anniversary. In addition, as cross-sector PD systems that involve EC and ECI practitioners are implemented, it will be important to draw on the empirical PD literature from both EC and ECI to inform enlightened, second-generation PD.

For now, let us commit to ensuring that generally ineffective one-shot workshops or episodic trainings unconnected to practitioners' day-to-day work no longer dominate the PD landscape. Moreover, as we begin to use technology as a medium for PD delivery, let us not repeat past mistakes by assuming that web-based modules, blogs, discussion boards, or posting resource materials online without considering structural and substantive features associated with effective PD will be sufficient forms (or doses) of enlightened PD. Practitioners and the children and families with whom they work deserve the best of what contemporary PD has to offer based on refined conceptualizations informed by emerging empirical evidence.

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