

# Practitioners' Self-Evaluations of Contrasting Types of Professional Development

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The effects of three types of in-service training on practitioners' self-evaluations of evidence-based preschool classroom practices were evaluated in a study of 255 participants from 26 states. Participants attended either conference presentations or 1-day or 2- to 3-day workshops or received one of two types of intensive in-service training (weeklong institutes or on-site training in the participants' classrooms). Study participants made self-ratings of the usefulness of the training content and the extent to which the training changed or improved their classroom practices, 1 or 6 months after training. Results show that both types of intensive in-service training are more effective than either conference presentations or workshops and that on-site training is more effective than weeklong institutes in affecting study participants' judgments of the in-service training. The findings are discussed in terms of the characteristics of in-service training most likely to change or improve preschool classroom practices.

**Keywords:** *in-service training; professional development; adult learning; practitioner evaluation*

Early childhood practitioners acknowledge the fact that passive types of in-service training are not likely to change or improve their practices (Sexton et al., 1996), yet one-time didactic workshops continue to be one of the primary methods for continuing professional development (Bruder, Mogro-Wilson, Stayton, Smith, & Dietrich, 2009; Bruder & Stayton, 2006; Wolfe, 1994). In a national study of nearly 2,000 early intervention and preschool special education practitioners, participants reported (a) conference presentations, workshops, and lectures as the most frequently attended types of in-service training and (b) coaching, mentoring, and clinical supervision as the least frequently used types of in-service training (Bruder, Dunst, & Mogro-Wilson, 2010).

Studies of the effectiveness of workshops have found them generally ineffective in changing either early childhood practitioners' interactions with young children or their classroom practices (Kontos, Howes, & Galinsky, 1996). In contrast, opportunities to observe and then implement early childhood practices, together with feedback from coaches or supervisors, have been shown to influence practitioners' adoption and use of evidence-based early

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childhood classroom practices (Leach & Conto, 1999). Venn and Wolery (1992), for example, provided child care personnel on-site training in their classrooms that included demonstrations of targeted practices by the investigators and opportunities for child care personnel to practice and receive feedback and ongoing coaching. The investigators found that the training improved practitioners' interactive behavior with young children during classroom routines. Similar types of findings have been found in other studies of early childhood intervention practices (e.g., Horm-Wingerd, Caruso, Gomes-Atwood, & Golas, 1997; Register, 2004; Tate, Thompson, & McKerchar, 2005), as well as for practices used by other disciplines (e.g., Davis et al., 1999; McDermott et al., 2001).

The purpose of our study was to assess the effects of contrasting types of professional development on early childhood practitioners' judgments of the usefulness of training content and changes in their classroom practices. The study was conducted as part of a line of research investigating the characteristics of evidence-based professional development where the presence or use of different characteristics was related to variations in trainee outcomes (Dunst, Trivette, & Hamby, in press).

## Classroom Practices

Table 1 shows the classroom practices that were the focus of in-service training. The practices are based on research originally conducted in child care and preschool classrooms where different features of program foundations, classroom organization, and instructional practices were evaluated in terms of their effects on practitioner and/or child outcomes (e.g., Frederiksen & Frederiksen, 1977; Hart & Risley, 1975; LeLaurin & Risley, 1972; Odom & Bailey, 2001; Porterfield, Herbert-Jackson, & Risley, 1976; Quilitch, 1975; Twardosz, Cataldo, & Risley, 1974). We employed these results, as well as findings from more recently completed studies, to develop and evaluate an evidence-based classroom model (Dunst, 1986; Dunst, McWilliam, & Holbert, 1986; Raab & Dunst, 1997) that included the practices that constituted the focus of in-service training. The more contemporary evidence for the practices is included next.

Classroom foundations include (a) a clearly stated program philosophy and associated program goals and objectives that guide classroom practices and practitioner relationships with families (Wishard, Shivers, Howes, & Ritchie, 2003), (b) the use of supervisory and professional development practices that include ongoing feedback on practitioner performance (Norman-Murch & Wollenburg, 2000; Strain & Joseph, 2004; Venn & Wolery, 1992), and (c) on-the-job training that includes specific practitioner expectations regarding classroom practices (Kunz et al., 1982). The foundations of the classroom model provide an infrastructure for practitioners to understand the expected practices and their implementation.

Classroom organization includes (a) the arrangement of the classroom environment in open spaces and the availability of appropriate toys and materials (DeLong et al., 1994; McCabe, Jenkins, Mills, Dale, & Cole, 1999; Nordquist, Twardosz, & McEvoy, 1991; Twardosz et al., 1974), (b) the assignment of practitioners to classroom areas (zones) rather than to individual children (Cotnoir-Bichelman, Thompson, McKerchar, & Haremza, 2006; T. P. Hall, 2006; Hart, 1982; LeLaurin & Risley, 1972), (c) developmentally appropriate and multiple child learning opportunities in the context of classroom activities and routines (Cote, 2001; Odom & Diamond, 1998; Wolery, Anthony, & Heckathorn, 1998), and (d) child transitions between

**Table 1**  
**Major Components of the Classroom Practices Constituting  
 the Focus of In-Service Training**

Classroom Component: Practices	Description
Classroom foundations	
Program philosophy	Written goals and objectives, clearly defined classroom activities to achieve the goals and objectives, school-home relationships
Staff management	Clear performance expectations, ongoing assessment of staff performance, performance feedback
Staff training	On-the-job training, coaching, joint planning
Classroom organization	
Environmental organization	Open classroom environment, clearly designated learning areas, safe and suitable equipment and materials, material availability
Staffing patterns	Staff assignments and responsibilities to classroom zones rather than to individual children
Instructional context	Routine-based learning, developmentally appropriate activities, smooth transitions between activities
Instructional practices	
Responsive teaching	In vivo instruction, interest-based child learning, caregiver responsiveness
Interactional style	Sensitivity to child behavior, supportive and encouraging teacher behavior
Behavior management	Positive behavioral supports, sit-and-watch disciplinary approach
Outcome evaluation	
Child engagement	Engagement with adults, peers, and materials
Child behavior	Positive social-affective behavior, prosocial interactions, goal directedness, self-initiated learning
Child development	Cognitive, language, literacy, social, adaptive, motor

classroom activities on an individual rather than group basis (LeLaurin & Risley, 1972; Sainato, 1990). The ways in which a classroom is organized and managed provide a basis for high levels of child engagement, which in turn provides practitioners opportunities to use responsive teaching practices.

Instructional practices include (a) responsive and incidental teaching methods and strategies (McGee, Almeida, Sulzer-Azaroff, & Feldman, 1992; Raab & Dunst, 2009; Yoder et al., 1995), (b) use of sensitive and supportive practitioner interactional behavior with young children (Mahoney & Wheeden, 1999; Norris & Hoffman, 1990), and (c) positive behavioral supports and disciplinary methods (Duda, Dunlap, Fox, Lentini, & Clarke, 2004; Porterfield et al., 1976; Tyroler & Lahey, 1980). These types of instructional practices ensure that classroom personnel take advantage of as many opportunities as possible to promote child learning.

Outcome evaluation includes (a) increases in child engagement with adults, peers, and classroom material (McGee, Daly, Izeman, Mann, & Risley, 1991; McWilliam, Trivette, & Dunst, 1985); (b) child-initiated learning and the development of prosocial child behavior (Sainato & Carta, 1992; Simeonsson, Huntington, Short, & Ware, 1982); and (c) changes in child development (McLean, Wolery, & Bailey, 2004). The assessment of child engagement, behavior, and development ensures that the information necessary to assess classroom impact is explicitly part of program evaluation.

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The complexity of the classroom model and the fact that each component has multiple sets of practices suggested that more intense (Dickinson & Brady, 2006) and job-embedded (Croft, Coggshall, Dolan, Powers, & Killion, 2010) professional development might be necessary to have optimal positive benefits. Research by Dickinson and Brady (2006), for example, showed that the types of practices constituting the focus of their work were complex and required 5- to 6-month interventions to be “effective in changing classroom practice” (p. 161). We expected to find similar results.

## Types of Professional Development

Professional development was conducted by early childhood professionals who were knowledgeable about and proficient in using the classroom practices. Three major types of professional development were conducted: conference presentations, workshops, and intensive training. Conference presentations, which included sessions lasting between 1 and 3 hours, were made at either state or national conferences. Conference presentations included descriptions of the classroom practices and their intended outcomes, the manner in which the different practices were related, and examples of practices in each of the four major components of the preschool classroom model. Two types of workshops were provided: 1-day workshops lasting between 4 and 6 hours and 2- to 3-day workshops lasting between 10 and 14 hours. Workshops included the same elements as conference presentations as well as participant opportunities to engage in a variety of exercises and activities to acquire knowledge about each classroom practice. Two types of intensive training were provided: weeklong training institutes and on-site training conducted in the participants’ preschool classrooms. The training institutes were conducted on 5 consecutive days in an interactive workshop format where participants were engaged in role-playing and other activities to promote their understanding of the classroom practices. On-site training was provided during three to four visits to a participant’s classroom over a 6- to 7-month period, with each visit lasting between 2 and 3 days. Each on-site training visit involved observations of practitioners’ teaching, trainer demonstrations and feedback to practitioners, and practitioners’ active participation in all aspects of using the classroom practices.

The three types of training differed in a number of ways. First, they differed in terms of the number of hours of training, varying between 1 and 60 hours. Second, they differed in terms of the depth of content covered, ranging from cursory coverage (conference presentations) to extensive coverage (intensive training). Third, they differed in terms of the number of examples used to illustrate the practices, varying from only a few during conference presentations to multiple examples during the 2- to 3-day workshops and both types of intensive training. Fourth, they differed in terms of the number of participant opportunities to engage in some type of exercises to learn the practices, varying from none during conference presentations to many during the institutes and on-site training. Fifth, they differed in terms of whether performance checklists were used as benchmarks for assessing mastery of the classroom practices, where only the intensive training included participants’ use of checklists to make explicit the behavior that was consistent with the classroom model. Sixth, they differed in terms of the “real life” use of the practices, where participants who received on-site training were the only practitioners who had the opportunity to use the procedures in the context of their own classrooms or center-based programs.

The ways in which the three types of in-service training differed from one another were the basis for testing several hypotheses. First, we expected to find a linear increase in participant-reported benefits of the in-service training based on the fact that the contrasting types of training differed in terms of the number of characteristics described above where conference presentations had the fewest, and on-site training the most, characteristics. Second, workshops and intensive training were expected to be judged as being more effective than conference presentations based on the fact that presentations included no opportunities to engage in exercises to learn about the classroom practices. Third, intensive training was expected to be judged as being more effective than workshops based on the fact that both types of intensive in-service training included more opportunities to engage in activities to learn and use the classroom practices. Fourth, on-site training was expected to be judged as being more effective than either multiple-day workshops or weeklong institutes based on the fact that on-site training included real-life opportunities to be actively involved in learning and using the classroom practices.

## Method

### Participants

The respondents were a sample of convenience that included 255 early childhood practitioners from 26 states who attended one of the three types of training on preschool classroom practices. The number of participants receiving the different trainings were 85 (conference presentations), 82 (workshops), and 88 (intensive training). All participants were directly involved in preschool classroom or center-based programs as teachers, related services personnel, or supervisors of classroom personnel.

The respondents volunteered to evaluate the trainings by providing their names and addresses, which were subsequently used for their receipt of a letter explaining the study, an evaluation scale, and a postage-paid envelope for returning the completed scale. Unfortunately, the nature of the recruitment process did not permit us to determine a return rate. Participants who volunteered were randomly assigned to receive the evaluation package either 1 month or 6 months after the trainings were completed. This data collection scheme was used to assess for a halo effect (Biernat, 2005) of the in-service training on respondents' judgments; that is, we purposely varied the timing of the outcome evaluation to control for a possible immediacy effect from the in-service training.

Table 2 shows the background characteristics of the study respondents. The majority of participants (96%) had either bachelor's or master's degrees, mostly in education or preschool special education (77%). The majority of the participants were either preschool teachers or supervisors who worked with teachers in their classrooms (77%). Finally, the majority of the participants (68%) had 6 or more years of experience working with preschool children.

The extent to which the background characteristics of the respondents differed according to the three major types of training (presentations, workshops, intensive training) was assessed by chi-square tests. The participants differed only in terms of their preschool classroom positions,  $\chi^2 = 17.49$ ,  $df = 4$ ,  $p < .01$ . A larger percentage of teachers and other classroom personnel (40%) received intensive training compared to that of supervisors (20%), and a smaller percentage of nonteacher classroom personnel (25%) attended conference presentations compared

**Table 2**  
**Background Characteristics of the Study Participants**

Characteristics	<i>n</i>	%
Education		
High school / associate's degree	10	4
Bachelor's degree	130	51
Master's or doctoral degree	115	45
Professional discipline		
Education / special education	196	77
Speech / occupational / physical therapy	46	18
Other	13	5
Position		
Supervisor	76	30
Teacher	119	47
Other	60	23
Years of experience		
0–5	82	32
6–10	71	28
11–15	56	22
>15	46	18

to that of teachers or supervisors (36%). There were no statistically significant differences on any other background variables as a function of type of in-service training,  $\chi^2 = 7.23$  to  $7.99$ ,  $df = 4$  to  $6$ ,  $p > .10$ . Although not randomly assigned to the three types of in-service training conditions, the respondents in the three groups were more alike than different, which reduces (but does not eliminate) selection as a possible problem in the study design.

### Types of Classrooms

Respondents worked in preschool special education, preschool, Head Start, child care classrooms, or another type of center-based program. The classrooms included children from birth to 3 years of age (8%), 3 to 5 years of age (40%), birth to 5 years of age (40%), or some other combination of child ages (12%). The classrooms served only children with disabilities (47%), children without disabilities (15%), and children with and without disabilities in inclusive settings (38%). The classrooms that included only children with disabilities were primarily programs operated by departments of mental retardation or developmental disabilities and public school preschool special education programs. The classrooms serving children without disabilities included child care programs and center-based classrooms operated by Family Resource Centers. The inclusive classrooms included Head Start programs and preschool classrooms operated by public schools or early childhood programs for children with disabilities.

### Trainers

The trainers included six early childhood professionals with either master's ( $n = 4$ ) or doctoral ( $n = 2$ ) degrees in early childhood special education, child development, psychology, or speech and language pathology. The two doctoral-level professionals and their colleagues developed, implemented, and evaluated the preschool classroom model and practices over

the course of 10 years (Dunst, 1986; Dunst et al., 1986; Dunst & Raab, 1999; McWilliam et al., 1985; Raab & Dunst, 1997; Wilson & Raab, 1997). The master's-level personnel were trained to use the different sets of practices in model-demonstration classrooms and the in-service implementation methods described above to train others to use the classroom model and practices. Five of the six trainers conducted all the types of in-service training, whereas one trainer conducted all but one type of in-service training.

## Evaluation Scale

A 24-item investigator-developed measure was used to have the participants evaluate the training they received. The measure included 12 practices for assessing the self-reported usefulness of the training and 12 practices for assessing self-reported changes in practitioner abilities. The scale items are indicators of the core practices of the preschool classroom model (Table 1). The practices included (1) classroom goals and objectives, (2) parent-practitioner partnerships, (3) practitioner supervision, (4) classroom organization, (5) developmentally appropriate activities, (6) personnel assignments to classroom activities and routines, (7) transitions between activities, (8) functional assessment and intervention, (9) instruction within classroom activities and routines, (10) responsive teaching, (11) positive behavioral supports, and (12) process and outcome evaluation.

Usefulness was assessed by asking participants to indicate the extent to which they found the training useful in their work with young children. Ability was assessed by asking participants to indicate the extent to which the training changed or improved their preschool classroom practices. Each of the usefulness and ability items was assessed on a 5-point Likert-type scale ranging from 1 (*not at all*) to 5 (*very much*) in terms of the respondents' self-evaluations. Similar types of measures have been used for evaluating the effects of in-service training on early intervention practitioners' knowledge and skills (e.g., Bailey, Buysse, & Palsha, 1990; Dunst, Trivette, & Deal, in press). We used a self-report measure because respondents resided in 26 different states.

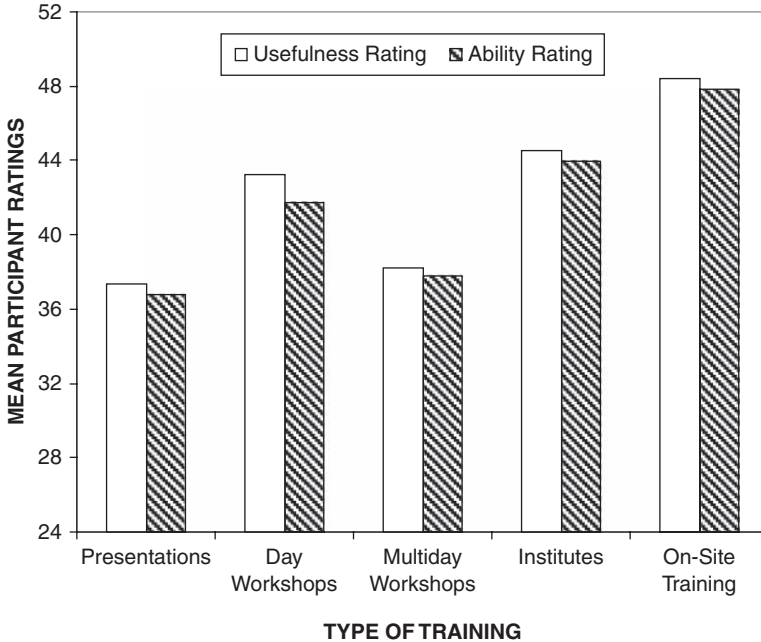
A principal component factor analysis of the 12 usefulness item responses produced a second-order single-factor solution ( $\alpha = .95$ ) accounting for 74% of the variance. A factor analysis of the ability item responses also produced a second-order single-factor solution ( $\alpha = .95$ ) accounting for 71% of the variance. A single second-order factor solution indicates that the factor structure is such that a total scale score is justified (Spector, 1992). Summated scores were therefore used as the dependent measures in the analysis described next.

## Analyses

Both multivariate and univariate analyses of variance were used to determine if the study participants' usefulness and ability scores were related to the contrasting types of training (e.g., presentations vs. workshops, workshops vs. intensive training) and when the participants completed the outcome measures (1 month or 6 months after the training was completed). The multivariate and univariate analyses of variance included preplanned comparisons to test the study hypotheses.

Because the contrasting types of training constituted a continuum based on the differences in the number of exemplars of and opportunities to use the classroom practices, we assessed whether there were incremental (linear) increases on the two outcome measures associated

**Figure 1**  
**Mean usefulness and ability ratings by the study participants receiving contrasting types of in-service training.**



with the different types of training. We also conducted a series of a priori pairwise orthogonal comparisons (e.g., presentations vs. on-site, institutes vs. on-site) to identify the relative effectiveness of the different types of training. Cohen’s *d* effect sizes were used to determine the magnitude of the differences on the outcome measures, given that it is now a generally accepted practice to use effect sizes rather than statistical significance for substantive interpretation of study results (Thompson, 2001).

### Results

Figure 1 shows the average participant usefulness and ability ratings for the contrasting types of in-service training. The multivariate analysis of variance with the usefulness and ability scores as the dependent measures produced a *between type of training group* difference,  $F(4, 233) = 6.34, p = .0001$ , but neither a *between time of completion of the dependent measures* difference or an interaction between type of training and time of completion of the outcome measures. Both analyses of variance produced *between type of training group* differences for the usefulness scores,  $F(4, 233) = 5.80, p = .0002$ , and the ability scores,  $F(4, 233) = 6.11, p = .0001$ . All three analyses showed that the participants’ judgments of the training differed as a function of type of professional development.



**Table 3**  
**Linear and Orthogonal Contrasts for the Effects**  
**of the Different Types of Inservice Training**

Contrasts	<i>F</i> Tests		Cohen's <i>d</i> Effect Sizes
	<i>df</i> = 1, 233	<i>p</i>	
Multivariate analysis			
Linear trend	16.87	.0001	.54
Presentations vs. workshops	3.14	.0778	.24
Presentations vs. intensive training <sup>a</sup>	23.62	.0000	.68
Workshops vs. intensive training	9.48	.0023	.49
Workshops vs. on-site training	8.79	.0033	.86
Usefulness ratings			
Linear trend	13.19	.0003	.48
Presentations vs. workshops	3.80	.0524	.28
Presentations vs. intensive training	20.96	.0000	.66
Workshops vs. intensive training	5.81	.0167	.44
Workshops vs. on-site training	5.45	.0204	.78
Ability ratings			
Linear trend	15.46	.0001	.52
Presentations vs. workshops	2.58	.1096	.20
Presentations vs. intensive training	22.27	.0000	.69
Workshops vs. intensive training	8.24	.0045	.54
Workshops vs. on-site training	7.25	.0076	.93

Note: A protected Bonferroni *p* value for each of the four orthogonal contrasts is  $.05/4 = .0125$ .

<sup>a</sup>For the purposes of preplanned comparisons of intensive training, weeklong institutes and on-site training were combined.

## Linear Trends

Table 3 shows the findings for the linear trends. In all three sets of analyses, there were, as hypothesized, linear trends on the dependent measures as evidenced by statistically significant *F*-test results and Cohen's *d* effect size estimates between .48 and .54. Results show a pattern of progressive increases in the participants' usefulness and ability ratings from conference presentations to workshops to institutes to on-site training.

## Orthogonal Contrasts

Table 3 includes the results for the orthogonal contrasts. The four sets of analyses for the multivariate and univariate analyses yielded results that generally support our hypotheses. Neither presentations nor workshops differed much from each other in terms of respondents' ratings of the usefulness of the training content or self-reported changes in their abilities. This is discerned from the nonsignificant *F* tests and small effect size estimates (with Cohen's *d* ranging from .20 to .28) for the *between type of training* comparisons. In contrast, intensive training (institutes and on-site training) was judged as being more effective than either conference presentations (Cohen's *d* = .66 to .69) or workshops (Cohen's *d* = .44 to .54), as evidenced by the *F*-test results and the effect size estimates for the *between types of training* comparisons for the multivariate and abilities analyses. Similarly, intensive training was judged as being

more useful than either conference presentations or workshops, as evidenced by the median effect size estimates (Cohen's  $d = .44$  and  $.66$ ) for the *between types of training* comparisons.

The study results support the hypothesis that on-site training would be judged as being more effective than workshops in affecting participants' ratings of the usefulness of the training content and changes in their classroom practices. The *between types of training* contrasts yielded significant  $F$ -tests results and effect size estimates between  $.78$  and  $.93$ . Post hoc comparisons between the weeklong institutes and on-site training showed that the latter was more effective in terms of affecting participants' self-reported usefulness ratings (Cohen's  $d = .37$ ) and self-reported changes in their classroom practices (Cohen's  $d = .40$ ).

## Discussion

Findings from our study show that participants' self-ratings of the usefulness of training content and the changes in their classroom practices are associated with the contrasting types of in-service training, where on-site training in the participants' classrooms is judged as being more beneficial than all the other types of training. Our results are congruent with those reported by Dunst, Trivette, and Deal (in press), who evaluated the effectiveness of similar types of in-service training on practitioner adoption and use of family-systems intervention practices (Dunst, Trivette, & Deal, 1988), where participants' involvement in real-life application of the practices was associated with the most positive learner benefits. The results are also consistent with findings from meta-analyses of adult learning methods and strategies where active learner participation in acquiring new knowledge or learning new practices was associated with the most positive changes in learner outcomes (Dunst, Trivette, & Hamby, in press; Trivette, Dunst, Hamby, & O'Herin, 2009).

## Study Limitations

Notwithstanding the positive results found in this study, a number of limitations need to be acknowledged and addressed in future research. One limitation is the use of a self-report measure as the study outcome. As noted previously, we used a self-report measure because the study participants reside in about half the United States. A more direct measure of participants' adoption and use of the classroom practices could have provided a better indication of the effects of in-service training. This type of direct measure was used with participants who received on-site training where we found expected changes in practitioners' use of the classroom practices (Wilson & Raab, 1997).

A second limitation involves not assessing other factors that might influence the effectiveness of in-service training. Factors such as readiness to change (Backer, 1994) and learner attitudes (Sawyer & Campbell, 2009) have been found to affect practitioners' adoption of new or innovative practices. For example, as part of the on-site training on the classroom practices described in this article, practitioners often differed in terms of their attitudes about the classroom model and their willingness to adopt the practices. Analyses showed that the largest changes in participants' classroom practices were among those practitioners who had the most positive attitudes toward the training. (These results will be described in a subsequent article describing actual changes in practitioners' adoption of the classroom procedures and factors

associated with variations in the use of the practices.) Researchers have shown that a willingness or readiness to change affects practitioner receptiveness to different kinds of training opportunities (e.g., Hall & Hord, 2006; Hall, Loucks, Rutherford, & Newlove, 1975). Future research could be strengthened by including measures that might mediate or moderate the effectiveness of in-service training.

A third limitation involved possible confounds associated with differences in the trainees' backgrounds, experiences, and understanding of the classroom model and practices and how variations in these factors might influence the effectiveness of training they were provided. The manner in which these relationships exist and moderate trainees' adoption and use of the classroom practices will need to be evaluated in future research to ascertain the validity of our findings.

A final limitation is the use of a sample of convenience for evaluating the effectiveness of the contrasting types of in-service training. Although common in many investigations, it might have influenced the nature of the findings to the extent that selection bias is a threat to internal validity (Shadish, Cook, & Campbell, 2002). For example, selection bias might be present if trainees differentially selected the type of in-service training they received. Researchers will need to consider the possibility that their sampling procedures do not affect results.

### Implications for Future Research

In addition to addressing the limitations that we describe above, there are several implications for further investigation of the effectiveness of contrasting approaches to in-service training. These include but are not limited to (a) random assignment of trainees to at least two or three types of in-service training (e.g., workshops vs. institutes vs. on-site training) controlling for hours of training, (b) explicit measurement of the ways in which the trainings differ from one another and how variations in implementation fidelity influence trainees' outcomes, and (c) systematic evaluation of the conditions under which in-service training of known characteristics influence learners' outcomes (Dunst, Trivette, & Hamby, in press; Trivette et al., 2009). The latter strategy will likely identify which characteristics matter most in terms of understanding how and in what manner in-service training is most effective.

### Implications for Professional Development

Based on our experiences teaching others to use the preschool classroom practices, as well as research by others who evaluated the effectiveness of different types of in-service training (e.g., Broyles & Tillman, 1985; Davis et al., 1999; Joyce & Showers, 1980; Leach & Conto, 1999; Neuman & Kamil, 2010), the variables that matter most in terms of potential benefits to trainees' are becoming increasingly better known (see Dunst, Trivette, & Hamby, in press). The characteristics that stand out as being most important include (a) multiple opportunities to engage in exercises, role-plays, and real-life opportunities to learn and master the practices; (b) demonstrations of the explicit practices and learners' opportunities to use those practices while receiving feedback and coaching; and (c) repeated teacher–learner interactions that strengthen practitioners' existing abilities and promote acquisition of new competencies. These important features have emerged from our experiences teaching practitioners to use a variety of early intervention practices (e.g., Dunst et al., 2010; Dunst, Trivette, & Deal, in press;

Swanson, Raab, & Dunst, in press) as well as from the results of research syntheses and meta-analyses of preservice and in-service professional development (Dunst, Trivette, & Hamby, in press; Trivette et al., 2009). Our experiences and the extant professional development literature have allowed us to develop and refine an evidence-based approach to preservice and in-service training that includes those implementation practices that matter most in terms of having optimal learner outcomes and benefits (cf. Dunst & Trivette, 2009). Neuman and Kamil (2010) identified similar characteristics as being most effective in preparing preschool personnel to work in classroom settings.

The effectiveness of the various types of professional development for training practitioners to use evidence-based early intervention practices has been optimized when a priori standards such as performance checklists are used as benchmarks against which procedures are compared and evaluated. Trivette et al. (2009), for example, found that the use of performance standards to have learners self-assess their progress in mastering new practices was associated with the best effects in learner outcomes. Similarly, Dunst, Trivette, and Hamby (in press) reported in a meta-analysis of adult learning methods that the use of performance checklists to have learners self-evaluate their understanding and use of innovative practices had a large effect size estimate (Cohen's  $d = .86$ , 95% confidence interval = .72 to .99), one larger than that of simply asking learners to self-evaluate their learning in the absence of using a performance checklist (Cohen's  $d = .49$ , 95% confidence interval = .39 to .58).

The next step in this line of professional development research will be the identification of the adult learning characteristics under which well specified conditions are most strongly related to practitioners' adoption and use of different types of evidence-based early intervention practices (cf. Dunst, Trivette, & Deal, in press; Dunst, Trivette, & Hamby, in press). We anticipate that the results will promote a better understanding of those professional development practices that are associated with optimal learner outcomes when used in the context of practitioners "on the job" lifelong learning (cf. Croft et al., 2010).

## Conclusion

Our findings, with others' results concerning in-service training (e.g., Horm-Wingerd et al., 1997; Malone, Straka, & Logan, 2000; Winton, McCollum, & Catlett, 2008), should promote identification of the types of processes and activities that are most likely to support meaningful changes in preschool personnel's practices. The knowledge gained from professional development research has direct implications for improving how best to conduct in-service training by identifying those factors that matter most in terms of improving preschool classroom practices. Moreover, the factors determined to date are ones that other researchers have noted as contributing to effective professional development in early intervention and early childhood education (e.g., Early et al., 2007; Hyson & Biggar, 2006; Korkus-Ruiz, Dettore, Bagnato, & Ho, 2007; Winton, McCollum, & Catlett, 1997).

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