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The Effects of Teacher Training on Teachers' Family-Engagement Practices, Attitudes, and Knowledge: A Meta-analysis

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ABSTRACT
When families are engaged in their education, children's academic, behavioral, and social-emotional development is indirectly supported. Many teacher-training programs (TTPs) focused on preparing teachers to communicate and work with families have been developed, although inconsistencies regarding their effectiveness exist. The current meta-analysis of 39 studies systematically analyzed the effects of TTPs on teachers' family-engagement practices, attitudes, and knowledge. TTPs included preservice university courses, teacher in-service, and professional development programs. Studies were coded for key sample, setting, and quality characteristics. Analyses revealed TTPs had a significant positive effect on all teacher family-engagement outcomes. Key intervention components were also determined (e.g., communication strategies, collaborative planning, and problem solving) and can be used to inform the development of future TTPs. Although results are promising, future TTPs should aim to improve methodological rigor and study quality.

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Background and significance

Family engagement defined

The term *family engagement* is often used in conjunction or interchangeably with parent involvement and family–school partnership (Sheridan, Holmes, Smith, & Moen, 2016). *Family engagement* is defined as the "beliefs, attitudes, and activities of families to support their children's learning, whether at home, at school, or in the community" (Weiss, Kreider, Lopez, & Chatman-Nelson, 2014; p. xviii). Though broad, this definition highlights the critical roles families play in their children's education. These roles include confirming their children's learning, campaigning on their children's behalf, directing their children through complex school systems, and advocating effective schools (Weiss et al., 2014). Within the context of teacher training, family engagement includes how teachers can support approaches used by parents in isolation (i.e., parent involvement) and embrace

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approaches used collaboratively to promote partnerships between families and schools (i.e., family–school partnerships). For purposes of the current study, the term *family engagement* is used in reference to both family–school partnership and parent-involvement interventions.

Ecological systems theory posits that children are influenced by the multiple proximal and distal environments in which they develop (Bronfenbrenner, 1977). Children's cognitive, behavioral, and social-emotional development is affected directly and indirectly via interactions that occur in their immediate environments (e.g., home and school). Within an ecological framework, family engagement is a shared responsibility, wherein both teachers and parents play a vital role. When parents and teachers work collaboratively, consult, and problem solve with one another, students experience increased social-emotional competencies and academic achievement, have positive gains in reading acquisition, complete homework at higher rates, and have fewer homework problems (Sheridan, Holmes, Coutts, & Smith, 2012; Hill & Tyson, 2009; Jeynes, 2012; Patall, Cooper, & Wynn, 2010; Sénéchal & Young, 2008). A large body of research, spanning across decades, has continually documented these benefits.

Teacher family-engagement attitudes and practices

Despite decades of research supporting family engagement's benefits on children's social, emotional, behavioral, and academic development (Sheridan, Holmes, Coutts, & Smith, 2012; Hill & Tyson, 2009; Jeynes, 2012; Patall et al., 2010), teachers are not always adequately prepared to consult and work with families (Chavkin & Williams, 1988; Epstein & Sanders, 2006; Weiss et al., 2014). Researchers and teacher educators are increasingly recognizing that an integral part of family engagement is helping teachers develop positive attitudes, relevant knowledge, and skills needed to work with families (Raitliff & Hunt, 2009). Unfortunately, some teachers have negative views regarding families' roles in children's education and feel unprepared to effectively communicate with families (Amatea, Mixon, & McCarthy, 2013; Bingham & Abernathy, 2007). Teachers can sometimes misjudge or misinterpret the practices of families without recognizing the ways in which parents can positively support children's academic skills (Brink, 2002; Carlisle, Stanley, & Kemple, 2005). Further, teachers are often obligated to relay difficult information regarding a child's lack of academic progress or behavioral concerns and do so despite minimal training in effective communication strategies with families (Minke & Vickers, 2014).

The field of consultation continues to be instrumental to family engagement as it has identified key components and collaborative practices that can be initiated and supported by teachers. These include effective communication, collaborative planning and problem solving, and continuity between home and school (Christenson, 2004; Coutts, Sheridan, Sjuts, & Smith, 2014). In an ideal

situation, teachers can establish structured communication in their classroom, create home–school notes to account for student behavior across settings, and invite parents to meet and develop strategies to support students who may be struggling. When teachers provide more opportunities for family engagement, it can help to improve parent–teacher relationships.

Teachers can also play a vital role in consulting with parents and promoting parent-involvement activities in the home (Smith, Myers, Moen, Kim, & Sheridan, 2013). Home-based parental involvement refers to various kinds of nonformal learning and teaching practices in relation to school that occur in the home (e.g., supporting literacy at home, monitoring homework completion). In addition, parents can supplement classroom instruction by providing cognitively stimulating activities at home (Chao, 2000). Teachers can support home-based parental involvement by providing educational materials (e.g., information on classroom activities, homework policies, and community programs) or conducting home visits to learn more about practices and supports available in the home.

In addition, as schools and communities continue to become increasingly diverse, teachers must consider and value diverse cultural backgrounds and perspectives of parents. When teachers and parents come together, each person's unique cultural experiences influence their frame of reference (Soo-Hoo, 1998). When parents and teachers communicate, they can create an open dialogue, learn about differing cultural contexts, and begin to understand each other's frame of reference. For example, a teacher may view parents as disengaged from their child's education if they are not physically present for school events. However, a parent could be absent for a host of reasons, including limited transportation, feeling intimidated by the teacher/school, or the need to work multiple jobs to provide the family with basic necessities (King & Goodwin, 2002). To expand cultural understanding and dispel assumptions and biases among teachers and parents, teachers must take an active role in creating a dialogue with parents. Teachers must have specific skills, knowledge, and dispositions to engage in collaborative practices, support home-based involvement, and engage in culturally responsive practices.

Teacher training in family engagement

Preparing teachers and offering continuing professional development focused on effective family engagement can positively impact teachers' attitudes about families, improve knowledge regarding families' roles in their children's education, and increase family engagement practices (Amatea, Cholewa, & Mixon, 2012; Raitliff & Hunt, 2009). This may indirectly improve children's academic, social-emotional, and behavioral development as cooperative efforts between families and schools are cultivated. In

addition, many teachers, researchers, and governmental mandates (e.g., National Council for Accreditation of Teacher Education [NCATE], 2008; No Child Left Behind [NCLB], 2002) have called for increased training in this area. The number of preservice and teacher-training programs (TTPs), including college courses, teacher in-service, and professional development programs, has continuously increased in conjunction with this recognized need.

Although historically sparse, preservice and in-service family engagement TTPs have increased substantially since the late 1980s and early 1990s (Epstein & Sander, 2006; Evans, 2013; Hiatt-Michael, 2001; Morris & Taylor, 1998). Prevalence estimates of family-engagement course offerings for preservice teachers has risen from 4%(Chavkin & Williams, 1988) to 59% (Epstein & Sander, 2006). Furthermore, 92% of preservice teachers surveyed reported that the topic was covered briefly in at least a few class sessions (Epstein & Sander, 2006). As the number of TTPs increases, more researchers are documenting training effects on teacher outcomes. When trained effectively in family-engagement practices, teacher benefits include improved attitudes toward working with families (Bartels & Eskow, 2010), greater sense of general teaching efficacy (Hoover-Dempsey, Walker, Jones, & Reed, 2002), and increased understanding of families' roles in children's education (Blasi, 2002). In addition, a recent systematic review Evans (2013) found that preservice training in family engagement was successful at improving preservice teachers' levels of confidence, self-awareness, knowledge of diverse families and their role in education, and ability to utilize knowledge about families to inform and improve instruction.

Although typically positive, variability in the effects of TTPs on family engagement is noted in the literature. Some research has indicated that new teachers, despite receiving training focused on working with families, still struggle with family engagement and are skeptical of families' roles in their children's education (Markow & Martin, 2005). Historically, teachers were found to overestimate their ability to effectively consult with families and thus report feelings of shock when later faced with the real-life complexities of family engagement (Veenman, 1984; Weinsten, 1988). However, more recent findings indicate that levels of confidence and self-efficacy remain high (and sometimes even increase) despite initially high levels prior to training (Evans, 2013). Further, it is expected that levels of teacher competence, practices, and attitudes toward engaging families would improve with the rising number of teacher-training programs. However, many recent surveys do not support this claim (e.g., De Bruïne et al., 2014; Epstein & Sander, 2006). Despite training, teachers still report feeling unprepared to work with families (Evans, 2013) and overwhelmed when they do interact with families (Epstein & Sander, 2006).

Inconsistencies and variability of training components and methodology also exist across TTPs. For example, some training packages include traditional lectures and are primarily information based (e.g., Bartels & Eskow, 2010); other interventions involve role plays and simulated experiences (e.g., Hoover-Dempsey et al., 2002; Walker & Dotger, 2012). Furthermore, some interventions include direct field experience for preservice teachers (e.g., Morris & Taylor, 1998) or train active teachers in effective communication strategies while in practice (e.g., Minke & Anderson, 2003). To date, there has not been systematic research evaluating training effects based on the methods by which training is delivered or the specific components utilized within family engagement TTPs. Components assessed in the current study were based on the literature review process and a previously conducted meta-analysis focused on family–school interventions.

Study purpose

The current study was designed to examine the efficacy of family-engagement TTPs on teacher family-engagement outcomes. Outcomes include teacher practices, attitudes, and knowledge related to family engagement; these have been noted as critical to family engagement, and previous findings indicate improvements after teachers participate in training. This study is the first of its kind to conduct a comprehensive synthesis of TTPs focused on family engagement for both preservice and active teachers. In addition, no studies have previously examined specific intervention components, participant characteristics, or study quality in the area of teacher training in family engagement.

This study involved a collection, synthesis, and analysis of the current state of literature on teacher training in family engagement, and theoretical and empirical understandings of the effects of TTPs in family engagement. Results of the current study provide an estimate of the effects of training for teachers and may provide guidance in the design of future TTPs related to engaging and working with families. The following research questions were addressed:

(1) What are the effects of family-engagement TTPs on teacher practices, attitudes, and knowledge related to family engagement?
(2) Which components within family-engagement TTPs contribute significantly to effects of teacher practices, attitudes, and knowledge related to family engagement?
(3) What are the moderating effects of study quality, teacher gender, teacher ethnicity, and teacher specialization/position (i.e., early childhood, elementary, middle, high school, or special education) on teachers' family-engagement practices, attitudes, and knowledge?

Research questions were based on evident gaps in the literature base and designed to clarify interventions to ultimately influence future TTPs. Research Question 1 targeted a previously described need for a quantitative analysis of effects for these interventions as previous studies have found conflicting results. As efforts to improve teacher training are becoming decidedly more prevalent, Research Question 2 explored the components within TTPs that may be contributing to teacher effects. Last, Research Question 3 assessed moderating effects according to study quality, teacher specialization/position gender, and ethnicity. Studies investigating the effects of family-engagement training vary significantly in the rigor and quality with which methodological elements were considered. Understanding the effect of study quality on research findings may provide recommendations for future work in the area. Further, studies include a range of teacher specializations/positions, from early childhood to high school teachers, in addition to teachers seeking special-education certification. The teacher specialization/position (i.e., early childhood, elementary, middle, high school, or special education) included within studies may moderate teacher-training effects, as TTPs may have been formed specifically for a target specialization or position. The moderating effects of gender and ethnicity are also considered standard practice for meta-analyses (Hedges & Olkin, 1985) and may provide nuanced information regarding the relationship between family-engagement TTPs and teacher family-engagement outcomes.

Methods

The current meta-analysis was conducted to examine the effects of family-engagement TTPs on teacher's family-engagement attitudes, knowledge, and practices. The following inclusion criteria were adapted and developed from a previous meta-analysis focused on family–school partnership and parent involvement interventions (i.e., Sheridan, Holmes, Coutts, & Smith, 2012):

(1) Studies must include a teacher- (or preservice-) training intervention focused on parent involvement (i.e., the participation of significant caregivers including parents, grandparents, stepparents, foster parents, etc.) in the educational process of their children to promote their academic and social well-being (Fishel & Ramirez, 2005) or family–school partnerships (i.e., child-focused approaches wherein families and professionals cooperate, coordinate, and collaborate to enhance opportunities and success for children and adolescents across social, emotional, behavioral, and academic domains; Christenson & Sheridan, 2001).
(2) Studies must involve active or preservice teachers.

(3) Studies must present outcomes (i.e., measured effects of family-engagement TTPs on teacher practices, attitudes/beliefs, and/or knowledge related to family engagement).
(4) Studies must include one of the following group research designs:
    (1) An experimental or quasi-experimental design in which groups are receiving one or more TTPs with one or more control groups with both pretest and posttest measures on at least one qualifying outcome.
    (2) A pre-, posttest design with measures on at least one relevant outcome using the same participants, including one- and multiple-group designs involving teacher-training interventions focused on family engagement.

Literature search

Studies were identified by the first author from (a) a comprehensive electronic search of online databases, (b) hand searches of specific teacher-training and educational psychology empirical journals, and (c) a gray literature search of unpublished dissertation studies. Searches were limited to only studies published in English between the years of 1988 and 2015. The year 1988 was chosen as the starting point due to Chavkin and Williams's (1988) study frequently being referenced by many researchers as the seminal piece of work in the area of teacher training on family engagement (e.g., Epstein & Sander, 2006; Evans, 2013; Hoover-Dempsey et al., 2002; Morris & Taylor, 1998). Major social science and educational research databases (i.e., *EBSCO: Academic Search Premiere, ERIC [Education] from FirstSearch, PsycINFO, ProQuest: ProQuest: Dissertation & Theses* [*including Dissertation Abstracts International*], and *Sociological Abstracts*) were searched using combinations of relevant terms (e.g., "teacher training" or "educator training" with "family" and "engagement"). Supplementary to the search of online databases, key journals in teacher education (e.g., *Teacher Education and Special Education, Journal of Teacher Education*) and educational psychology (e.g., *Journal of Educational Psychology, Journal of School Psychology)* were also searched. Previous meta-analyses have also noted a possible overestimation of intervention treatment effects due to publication bias as these meta-analyses only reported and analyzed published studies (Begg & Berlin, 1988). To account for publication bias, this study also included unpublished dissertations/theses.

Identification of studies

Following the literature search procedures, 3,687 abstracts were retained for potential inclusion in the EndNote database (See Figure 1). Following the four inclusion criteria previously described, the first author reviewed each abstract to determine potential fit. When abstracts did not provide sufficient

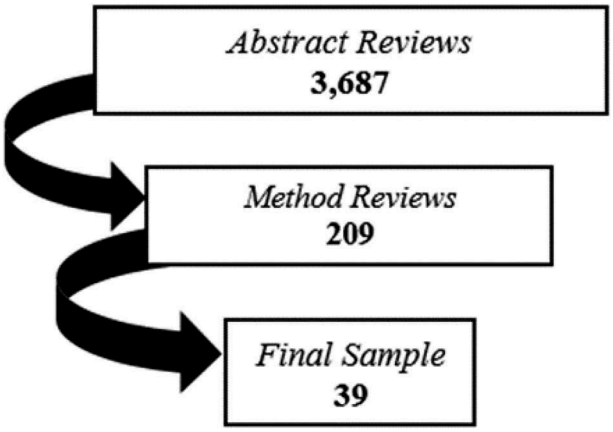

Figure 1. Number of studies included at each stage of meta-analysis. This figure demonstrates the number of potential studies during the abstract reviews and method reviews, in addition to the final sample included for analyses.

information to make a determination regarding inclusion, the article was retrieved so that determination could be based on a review of the method sections. The final number of studies included at this point was 209.

Next, to determine inclusion for the final sample, the first author, along with three trained research assistants, retrieved and reviewed the method sections of each study. At this time, inclusion determination was again based on the four inclusion criteria previously described. Each method section was reviewed by one researcher, with 25% read by the first author and all three research assistants. Thirty-nine total journal articles and dissertations/theses were included as the final study sample.

Study coding

Research assistants were trained on a coding system used to acquire study information pertinent to research questions. The coding system included study descriptors (e.g., publication year, author[s]), sample participants (e.g., ethnicity, gender, years teaching [if applicable], area of specialization, level of education), and setting information (e.g., location, community type). Coders also extracted study information regarding family engagement TTP components (see Table 1), method of intervention delivery (e.g., hypothetical/simulated experiences, field experiences), teacher outcomes (e.g., perceived efficacy for engaging families, inviting parents to participate in school events), effect sizes (e.g., treatment/control sample sizes, means, and standard deviations), and study quality.[1] Twenty-five percent of the final sample was coded by all coders. Each week, coders met to discuss disagreements, and final consensus was determined. Kappa was used to determine interrater

Table 1. Description of Family Engagement TTP Components.

Component	Description
Communication strategies	Efforts aimed at improving the exchange of information between teachers and parents and/or school and families. This includes both one-way contact (e.g., sending home newsletters or notes, calls from the school/teacher to parents, invitations to involvement) and bidirectional communication (i.e., two-way sharing of information between parents and teachers/schools/school personnel)
Collaborative planning and problem solving	Practices wherein parents and teachers come together on behalf of children such as joint decision making, goal setting, troubleshooting
Cultural awareness/working with diverse populations	Efforts oriented toward preparing teachers to work with diverse populations (e.g., minority groups) and/or specialized populations (e.g., students with disabilities, autism, etc.)
Home-based involvement	Teacher support of parents' involvement in literacy environment and practices (e.g., reading together, taking children to the library); discussion (e.g., talking with children about school or learning); enrichment (e.g., providing enriching activities to children, such as visits to a museum); tutoring (e.g., parents' use of specific skills or behaviors to provide direct instruction on tasks outside of homework); mathematics environment and practices (e.g., doing math exercises together, discussing math at home); or a combination of these forms of involvement or other forms of home-based involvement not outlined
Family engagement attitudes/ beliefs	Efforts aimed at improving teachers' beliefs about families (e.g., role of families in their child's education; perspectives of family efficacy for engagement) and/or beliefs about engagement practices (e.g., efficacy for engaging families, attitudes toward parent involvement practices)
Parent–teacher relationship	Aimed at enhancing the relationship between teachers/school personnel and parents on behalf of children through such practices as trust building, creating joint perspectives, providing encouragement (e.g., providing affective encouragement, praise, social reinforcers, affective prompts, or reinforcement), showing respect, and effectively resolving conflict
School-based involvement	Teacher support of parents' provision of resources toward children's education at the school (e.g., volunteering in the school or classroom; attending parent–teacher conferences; involvement in PTA or governance)
School environment	Efforts oriented toward making parents feel welcome at children's school through such practices as creating a welcoming environment or making conditions conducive to parents coming to school (e.g., providing child care during meetings, providing meals, etc.)

reliability for categorical variables, and intraclass correlations were calculated for continuous variables (Orwin & Vevea, 2009). Intraclass correlation coefficients ranged from .82 to .94, and all kappas were above .90 for categorical variables.

Data analysis

Effect size estimates were drawn from studies that assessed an intervention's effect on teachers' outcomes using both independent groups' (IG) designs and repeated measures (RM) designs. Standardized mean difference effect size

estimates (Hedges & Olkin, 1985) were calculated (using Hedges' *g*) for each study and its outcomes. Hedges's (1981) bias-correction formula was applied to each *g* value to provide the unbiased estimate and its variance. When treatment and/or control group means and standard deviations were not reported in a study, effect estimates were calculated using relevant test statistic transformation formulas (Borenstein, Hedges, Higgins, & Rothstein, 2009) where possible.

Robust variance estimation (RVE; Hedges, Tipton, & Johnson, 2010) was employed to answer the current study's research questions and address potential concerns with effect size dependency. The RVE model is increasingly being utilized in psychology, education, and medicine intervention research as it addresses key limitations of previous meta-analytic approaches. With the RVE model, it is recommended that researchers choose a weighting scheme based on the most frequent source of dependence in their data (Tanner-Smith, Tipton, & Polanin, 2016). Therefore, as studies included in the current analyses frequently provided more than one effect size estimate (i.e., a correlated estimation error), the "correlated effects" weighting scheme was used to determine approximate inverse variance weights (Fisher & Tipton, 2015, p. 4). In addition, both I^2 and Q statistics were calculated to assess between-study variance.

Effect sizes were grouped accordingly, and estimates were calculated through RVE meta-regression. To assess the effects of teacher training in family engagement on teacher outcomes (i.e., Research Question 1), RVE meta-regression was conducted for (a) all teacher outcomes combined and (b) teacher outcomes separately (i.e., teacher family-engagement attitudes, knowledge, and practices). To conduct an intervention component analysis (i.e., Research Question 2), effects were organized according to intervention components used within a study. For example, effect sizes yielded from all studies that involved collaborative planning and problem solving were grouped together and a single robust variance estimate and robust standard error was calculated. This same procedure was used with each of the intervention components. To assess the differential effects of family-engagement teacher-training interventions on preservice teachers compared to active teachers (i.e., Research Question 3), effects were organized according to whether a study involved preservice or active teachers. Finally, to determine moderating effects (i.e., Research Question 4), effects were analyzed after being grouped by moderating variables of interest (i.e., study quality, specialization/position, gender, and ethnicity) through either categorical or dummy coding.

[1]Study-quality codes were based on the American Psychological Association (APA), 2008 Publications and Communications Board Working Group on Journal Article Reporting Standards (JARS; 2008).

Results

This meta-analysis was designed to assess the impact of family-engagement TTPs on teachers' attitudes, practices, and knowledge related to family engagement. Results of the current study analyses follow. First, the final sample is described to provide participant and sample characteristics of included studies. The Appendix provides characteristics for each study included in the meta-analysis. Second, this section presents results of RVE used to estimate effect sizes for (a) all teacher outcomes, (b) teacher outcomes by group (i.e., attitudes, knowledge, and practices analyzed separately), (c) family-engagement TTP component analyses, and (d) differential effects of training for preservice compared to active teachers. Third, moderating effects of study quality (i.e., low, moderate, high), gender, ethnicity, and specialization/position are reported. Last, this section concludes with results of I^2 and Q statistics to assess for heterogeneity.

Final sample characteristics

The final sample includes 39 total studies with 393 effects (i.e., an average of 10.07 effects per study). Of these studies, 32 (82.05%) are from peer-reviewed journals (e.g., *Teaching Education, Action in Teacher Education, The Teacher Educator*, and *Urban Education*), and seven (17.95%) are dissertations or theses from universities. The majority of studies (n = 26, 66.67%) involved preservice teachers, and active teachers composed the sample in the remaining studies (n = 13, 33.33%). Within studies, participant sample size ranged from 13 to 545 (mean = 74.13). The majority of studies involved elementary or early childhood teachers. Of studies that included gender information (n = 29), approximately 88% of participants were female and 12% of participants were male. This is comparable to recent trends reported by the National Center for Education Information, which estimates that 84% of K–12 public school teachers are female and 16% are male (NCEI, 2011). In addition, of studies that included information on ethnicity, 76% of participants were White, which is comparable to recent national trends suggesting 84% of teachers are White (NCEI, 2011). Training interventions occurred in various contexts, with the majority taking place in university settings (i.e., 32 total studies, 82.05% of the sample). Training for the remaining sample occurred in educational/school professional development settings (n = 5, 12.82%) or online (n = 2, 5.13%). Regarding study quality, the majority of studies were categorized as moderate quality (n = 22, 56.41%), with twelve (30.76%) being low quality, and the remaining five (12.83%) being high quality.

Not surprisingly, all studies involved some sort of information presented or shared among participants (e.g., lectures on general parent involvement, class presentations, etc.). Training areas covered topics such as

understanding families/family systems, developing skills for working with families, and recognizing families' roles in education and child/adolescent development. Beyond simply sharing information during intervention trainings, eighteen studies (46.15%) included subjects participating in hypothetical scenarios (e.g., role plays of IEP meetings) and/or simulated experiences (e.g., online, simulated parent-teacher conferences), and nineteen (48.72%) involved direct field experience in some way (e.g., meeting with parents at parent–teacher conferences). Further, three studies (7.7%) utilized coaching or supervision of intervention components by trained professionals (e.g., consultants directing problem-solving meetings between parents and teachers).

Family-engagement TTPs included numerous components such as school environment, school-based involvement, parent-teacher relationship, family-engagement attitudes/beliefs, home-based involvement, cultural awareness/working with diverse populations, communication strategies, and collaborative planning and problem solving. Depending on the method of intervention delivery (e.g., hypothetical/simulated experiences, direct field experiences, presented information/information sharing), components could have been the focus of the teacher-training intervention and/or activities participants engaged in directly. Among teacher-training interventions, components most frequently utilized include content related to communication strategies, parent–teacher relationship, and collaborative planning and problem solving. Teacher interventions were least likely to incorporate components involving school environment, parent–child involvement quality, or home-based involvement.

Research question 1: Effects of family-engagement TTP on teacher outcomes

Across family-engagement TTPs included in the meta-analysis, there was a significant main effect across all outcomes (i.e., teacher family-engagement attitudes, knowledge, and practices; see Table 2) at $\alpha = 0.01$. This indicates that teacher-training interventions are associated with positive effects for teacher family-engagement outcomes.

Similarly, when each group of outcomes was analyzed separately (i.e., teacher family-engagement attitudes, knowledge, and practices), family-engagement TTPs were found to have a significant treatment effect on all three types of teacher outcomes at $\alpha = 0.05$ (see Table 3). This indicates that family-engagement TTPs are associated with positive effects for teachers' attitudes, knowledge, and practices related to family engagement.

Table 2. Family Engagement TTP Effects Across All Outcomes.

All outcomes						
k	*n*	*b*	*SE*	*t*	*df*	*p*
39	393	0.635	0.061	10.408	34.532	.000**

TTP = teacher-training program; *k* = number of studies; *n* = number of effects; *b* = coefficient; *SE* = standard error.
**$p < .05$

Table 3. Family Engagement TTP Effects per Outcome.

Outcome	*k*	*n*	*b*	*SE*	*t*	*df*	*p*	95% *CI*
Attitudes	33	255	0.433	0.048	8.945	10.295	.000**	[0.177, 0.834]
Knowledge	14	65	0.706	0.161	4.382	6.971	.003**	[0.059, 1.152]
Practices	9	73	0.564	0.047	12.092	5.132	.001**	[0.151, 0.438]

TTP = teacher-training program; *k* = number of studies; *n* = number of effects; *b* = coefficient; *SE* = standard error; *CI* = confidence interval.
**$p < .05$

Table 4. Family Engagement TTP Effects by Component.

Component	*k*	*n*	*b*	*SE*	*t*	*df*	*p*	95% *CI*
Collaborative planning and problem solving	17	197	0.798	0.137	5.809	7.953	.000***	[0.090, 1.139]
Communication strategies	25	275	0.631	0.131	4.804	10.057	.001***	[0.401, 0.948]
Cultural awareness/ working with diverse populations	16	202	0.658	0.150	4.392	9.107	.002***	[0.071, 1.121]
Family engagement attitudes/beliefs	22	13	.554	.201	5.213	7.098	.003***	[0.101, 0.333]
Home-based involvement	6	49	0.614	0.157	3.923	2.715	.035**	[0.115, 0.434]
Parent-teacher relationship	21	284	0.561	0.089	6.337	9.637	.000***	[0.146, 0.555]
School-based involvement	12	107	0.502	0.072	6.958	3.168	.005***	[0.161, 0.125]
School environment	5	45	0.853	0.162	5.276	3.166	.012**	[0.139, 0.417]

Note: If df < 4, results should not be trusted (as recommended by Tanner-Smith et al., 2016). TTP = teacher-training program; *k* = number of studies; *n* = number of effects; *b* = coefficient; *SE* = standard error; *CI* = confidence interval.
**$p < .05$; ***$p < .01$.

Research question 2: Family-engagement TTP component analysis

The effect of each TTP component (e.g., parent–teacher relationships, school environment) on teachers' family engagement outcomes was also analyzed. Results revealed a significant effect when family-engagement TTPs utilized or focused on collaborative planning and problem solving, communication strategies, cultural awareness/practices, family-engagement attitudes/beliefs, and parent–teacher relationships at $\alpha = 0.01$ (see Table 4). Although significant effects were also indicated for TTPs that included school-based involvement ($\alpha = 0.01$) and school-environment and home-based involvement ($\alpha = 0.05$), degrees of freedom with these analyses were less than 4, making it difficult to rule out potential Type 1 error inflation due to too few studies and/or effects (Tanner-Smith et al., 2016).

Table 5. Moderating Effects of Study Quality, Ethnicity, Gender, and Teacher Specialization/Position.

Parameter	*b*	*SE*	*t*	*df*	*p*	95% *CI*
Study quality						
Intercept	0.084	0.203	0.412	8.348	.691	[0.179, 0.830]
Study quality	−0.135	0.072	1.860	9.547	.094	[−5.95, 0.93]
Ethnicity						
Intercept	0.645	0.398	1.780	8.433	.021	[−0.125, 1.411]
%W/C	−0.003	0.004	−0.599	9.320	.665	[−0.010, 0.005]
%H/L	0.004	0.004	0.893	2.253	.383	[−0.005, 0.12]
%A/A	0.046	0.144	0.217	1.895	.779	[−0.248, 0.340]
%Bl	0.609	0.409	1.256	5.122	.151	[−0.227, 1.444]
Gender						
Intercept	0.453	0.370	.891	5.560	.014	[−0.015, .1.121]
% Male	0.012	0.087	0.091	8.070	.675	[−0.010, 0.007]
% Female	0.005	0.123	0.865	2.220	.309	[−0.025, 0.013]
Teacher specialization/position						
Intercept	0.349	0.478	1.700	12.800	.015*	[−0.125, 1.470]
%EC	0.789	0.151	4.230	10.200	.311	[−0.101, 0.005]
%EL	0.577	0.127	4.708	9.730	.801	[−0.005, 0.012]
%MS	0.046	0.144	0.317	2.050	.755	[−0.208, 0.149]
%HS	−0.448	0.006	−2.237	7.400	.032*	[−0.027, −0.001]
%SPED	0.009	0.119	1.486	3.458	.165	[−0.137, 1.041]

k = number of studies; *n* = number of effects; *b* = coefficient; *SE* = standard error; *CI* = confidence intrval; EC = early childhood; EL = elementary; MS = middle school; HS = high school; SPED = special education; A/A = Asian American; Bl = Black/African-American; H/L = Hispanic/Latino; W/C = White (Caucasian).
*$p < .01$.

Table 6. Results of Heterogeneity Tests.

k	*Q*	*df*	*p*	I^2 (%)	95% uncertainty interval
39	68.44	38	0.09	44	0–75

Note. 95% uncertainty intervals are calculated as proposed by Higgins and Thompson (2002).

Research question 3: Moderating effects

Moderation analyses were conducted to assess the effects of study quality, gender, ethnicity, and teacher specialization/position (see Table 5) on outcomes of family-engagement TTPs. Results revealed that teacher outcomes were not significantly moderated by level of study quality. Additional moderation analyses did not indicate significant interaction effects for ethnicity or gender. Therefore, teacher outcomes are unlikely to be influenced by teacher participant gender or ethnicity. Moderation analyses of teacher specialization/position did reveal a significant negative interaction effect for high school teachers ($b = -1.48$, $t = -2.237$, $p = .032$) at $\alpha = 0.01$, suggesting that the effects of TTPs are less robust for high school teachers in comparison to early-childhood, elementary, and special-education teachers.

Tests of heterogeneity

The results of heterogeneity testing indicate a moderate percentage of variability between study effects (see Table 6). Results were assessed according to previously determined thresholds (i.e., 0%–40% = might not be important; 30%–60% = may represent modest heterogeneity; 50%–90% = may represent substantial heterogeneity; 75% to 100% = considerable heterogeneity; Higgins & Thompson, 2002). This I^2 statistic shows that a modest amount of variability across studies be may due to heterogeneity rather than chance alone.

Discussion

Main findings

This study quantitatively assessed the impact of family-engagement TTPs on teachers' attitudes, knowledge, and practices related to family engagement. Significant main effects were revealed when family-engagement TTPs were examined across all teacher outcomes, indicating that TTPs had a positive impact on key teacher family-engagement outcomes. When the impact of TTPs on each outcome type was examined separately (i.e., family engagement attitudes, knowledge, and practices), significant effects were also found. This indicates that, when trained in family engagement, teachers often feel more confident and knowledgeable about working with families and improve the ways in which they interact and consult with families. This is consistent with a previous systematic review which found that teacher training increased teacher self-efficacy for working with families (i.e., Evans, 2013).

Next, analyses attempted to identify and distinguish components within family-engagement TTPs that have had the greatest impact on teacher outcomes. A number of TTP components were found to have a significant impact on teacher family-engagement outcomes when analyzed separately (i.e., collaborative planning and problem solving, communication strategies, cultural awareness/working with diverse populations, family-engagement attitudes/beliefs, and parent–teacher relationships). This is consistent with much of the family-engagement intervention literature (e.g., Grolnick & Raftery-Helmer, 2014) that has identified these components as key ingredients within parent involvement and family–school partnership programs.

Further, study results were not significantly moderated by study quality. As previously reported, studies were coded for study-quality indicators (e.g., randomization, control procedures, multimethod assessment). The majority of studies fell into the moderate quality range, and only a small number of studies involved procedures consistent with a low- or high-quality study. This makes interpretation of the moderating effects of study quality difficult due to the high degree of homogeneity in the sample.

Last, a moderate degree of heterogeneity was observed in the study sample. Potential sources of heterogeneity were explored through both moderation analyses and informal review of the study sample. Overall, moderation analyses cannot explain heterogeneity, with the exception of teacher specialization/position, which found that high school teachers are less impacted by teacher training in comparison to early-childhood, elementary, and special-education teachers. This is consistent with much of the family-engagement intervention literature that has found school-based family engagement to decline as children grow older and enter secondary school (Hill & Chao, 2009). Further, teachers are often not expected to promote family engagement at the high school level (Patrikakou, 2004), even though children continue to benefit when parents maintain involvement throughout high school (Jeynes, 2007). It should be noted that high school student success is driven by developmentally appropriate family-engagement strategies that are often more subtle and nuanced in comparison to what is done at the elementary level (e.g., increased parental expectations; Patrikakou, 2004). According to an informal review of the included sample, teacher-training interventions occur in various contexts and have a range of durations. Study contexts and intervention duration were not central to the author's research questions and were rarely reported; however, they may provide further explanation regarding heterogeneity. Future studies should examine moderating effects of teacher-training contexts and study duration.

Contributions of this study

Results of the present study support the hypothesis that family-engagement TTPs can significantly influence teacher's attitudes, knowledge, and practices related to family engagement. This extends previous research on teacher training in family engagement by serving as the first meta-analysis to systematically combine and quantitatively examine results across studies. Results indicate that family-engagement TTPs should continue to be utilized both in the contexts of preservice college coursework and with professional development and in-service programs for active teachers.

Further, this study provides insight into key program components that are likely to drive family-engagement TTP results. Many of the key program components identified (i.e., communication strategies, collaborative planning, and problem solving) are consistent with previous findings of parent involvement and family–school partnership interventions (e.g., Conjoint Behavioral Consultation; Sheridan et al., 2012). Communication is consistently found to be a key aspect of family-engagement approaches and parent–teacher relationships (Garbacz et al., 2008; Sheridan, Holmes, Coutts, & Smith, 2012), and results further highlight the importance of including

communication strategies as a focal point within TTPs. In addition, the results provide further evidence for the influence of indirect conjoint practices between families and teachers to ultimately create ideal settings for children's academic, behavioral, and social/emotional development to prosper.

Results of the current study also impact the field of consultation, both in terms of supporting practices utilized within consultation models and in consideration of teachers as consultants. For example, one consultation model that directly engages families in their children's education by bringing parents and teachers together is Conjoint Behavioral Consultation (CBC; Sheridan & Kratochwill, 2008). CBC is an indirect method of service delivery that facilitates collaborative problem solving between parents and teachers and has demonstrated improvements in children's adaptive skills, functional communication, and on-task behavior (Sheridan, Ryoo, Garbacz, Kuhn, & Chumney, 2013). Key components integral to consultation models such as CBC (e.g., parent–teacher relationship, collaborative planning, and problem solving) have additionally been found as important ingredients in TTPs. Moving forward, it is imperative that teachers receive opportunities to interact with families during their training experiences. Results are also promising for home-based involvement as an active ingredient. At this point, results are limited to only a few studies in which teachers supported home-based parental involvement. However, results of those studies are positive and indicate that teachers may play an important indirect role in supporting parental activities occurring at home.

Engaging and effectively communicating with families is one of the most difficult tasks for teachers. Many teachers are eager to work with families, although they often lack the time necessary to learn how to effectively engage families. The current study revealed that when time is taken to prepare teachers for the complexities of working with families, teachers' family-engagement attitudes, knowledge, and practices can improve. It is imperative that future family-engagement TTPs provide teachers with opportunities to learn and practice key family-engagement skills (e.g., effective communication strategies). As teachers become more confident, capable, and well versed in collaborative strategies that lead to high-quality, positive relationships with families, children will continue to benefit and reap the rewards of these connections.

Limitations and future research

There are four limitations to note when considering the current meta-analysis overall. First, the majority of studies involved multiple intervention components, which makes it difficult to identify the degree to which each component is driving intervention results. It may be a certain combination of components that is having the greatest impact on training results. For

example, even though collaborative planning and problem solving was found to have a significant impact on teacher outcomes, it is uncertain that training-intervention effects should primarily be attributed to collaborative planning and problem solving or only when the component is in conjunction with communication strategies.

Second, both intervention-training components and teacher outcomes were collapsed and organized into broader groups. For example, communication strategies included one-way contact (e.g., teachers inviting parents to participate in school activities), bidirectional communication (e.g., home–school notes to support a child's academic work completion), and specific communication techniques and practices (e.g., using empathetic statements, open-ended questioning, etc.). As for outcomes, the category of attitudes included a broad range of dimensions including attitudes/beliefs about general parental involvement (e.g., attitudes about families' role in their children's education), specific groups of people (e.g., beliefs about working with Latino families), and personal competencies (e.g., self-efficacy for engaging families).

Third, both studies involving preservice and those involving active teachers were included in the current meta-analysis. Tailored and specific training approaches for each group separately may have been overlooked when these groups were combined. Uncovering the approaches that may be effective for one group relative to another is difficult given the parameters of the current study. Future explorations should distinguish the two and determine ideal training contexts that support teacher and preservice teacher outcomes separately.

Fourth, restricted inclusion criteria and search procedures make it difficult to conclude that a truly exhaustive search of the literature was conducted. For example, the current study did not include single-case studies or non-English studies. Single-case design studies can provide key insight to specific behavior changes (e.g., effects of training teachers on observed collaborative statements during parent–teacher conferences). Recent advancements in statistical techniques have made it possible to combine effect sizes yielded from single-case design studies with group-design research. Single-case design studies may also provide key insight into specific, nuanced training procedures that may be lost when researched at a larger group level. In addition, by not including studies conducted in languages other than English, the current study may be inadvertently excluding an entire country or region simply because of language. This may systematically bias meta-analysis results and reduce the accuracy of combined effects (Jüni, Holenstein, Sterne, Bartlett, & Egger, 2002). To more comprehensively search the literature based, future studies should expand search procedures to explore non-English studies in addition to including single-case design studies.

Conclusion

The purpose of this study was to systematically analyze the influence of family-engagement TTPs on teachers' family-engagement attitudes, knowledge, and practices. Coding revealed that studies primarily involved Caucasian (white), female, and preservice teachers and occurred in the context of university coursework. Studies involving active teachers and specific populations (e.g., teachers of students with autism) and occurring in the context of professional development/in-service training were also included, but were less frequent in comparison. Results revealed that family-engagement TTPs had a significant positive impact on all teacher outcomes when both grouped together and analyzed separately. Key teacher-training intervention components were identified, and it was revealed that when the components of parent–teacher relationships, collaborative planning and problem-solving, communication strategies, and cultural awareness/working with diverse populations were utilized, larger intervention impacts were present. Tests of heterogeneity indicated that the study sample consisted of moderate heterogeneity, which may only partially be explained by moderating variables (i.e., specialization/position [high school teachers in comparison to early-childhood, elementary, middle school, and special-education teachers]). Teacher outcomes were not found to be moderated by gender, ethnicity, or study quality. Although study quality was not found to moderate treatment effects, studies were primarily found to be of low to moderate quality. Several study limitations were reported and thus should be considered when interpreting study results. Study results can be utilized to inform future teacher-training interventions as their utility and positive impact for both preservice and active teachers is supported. Future teacher-training interventions should aim to improve methodological rigor and overall study quality by including control groups, using randomization procedures, and assessing outcomes using multiple approaches.

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Appendix

Characteristics of included studies

Author (year)	Sample size	Specialization/ position (%)[a]	Gender	Ethnicity[b]	Method delivery	TTP components[c]	Outcomes	Type of study	Country
Amatea, Cholewa, and Mixon (2012)	138	EL (100)	Female (91.0), Male (9.0)	W/C (75.0), Bl (7.0), A/A (6.0), H/L (12.0)	Pres. Info., Hyp./ Sim.	C-S, P-T, CPPS, SE, CAW, FEA	Attitudes, Knowledge, Practices	Journal article	USA
Bennett-Conroy (2012)	192	MS (100)	Female (64.0), Male (36.0)	W/C (70.0), Bl (6.0), H/L (21.0), Oth (3.0)	Pres. Info., Field Exp., Coach./Sup.	CS, P-T, HBI	Practices	Journal article	USA
Bergman (2013)	100	MS/HS (100)	Female (91.0), Male (9.0)	W/C (95.0), Oth (5.0)	Pres. Info., Field Exp.	CS, SE	Attitudes, Practices	Journal article	USA
Bingham and Abernathy (2007)	49	SPED (100)	Female (90.0), Male (10.0)	NR	Pres. Info.	CAW, P-T, FEA	Attitudes	Journal article	USA
Brown, Harris, Jacobson, and Trotti (2014)	455	EC/EL (60.7), MS (20.7), HS (12.5), Oth. (6.1)	Female (91.0), Male (9.0)	W/C (95.0), Oth (5.0)	Pres. Info., Field Exp.	CS, SE, FEA	Attitudes, Practices	Journal article	USA
Curran and Murray (2008)	57	SPED (72.1), EC (15.9), Oth. (12.0)	Female (86.0), Male (14.0)	W/C (75.0), Bl (7.0), A/A (6.0), H/L (12.0)	Pres. Info.	CS, CPPS, P-T, FEA	Attitudes	Journal article	USA
Denessen, Kloppenburg, Bakker, and Kerkhof (2009)	545	EL (100)	Female (85.0), Male (15.0)	NR	Pres. Info., Field Exp., Coach./Sup.	CS, HBI, FEA	Attitudes	Journal article	Netherlands

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Author (year)	Sample size	Specialization/ position (%)[a]	Gender	Ethnicity[b]	Method delivery	TTP components[c]	Outcomes	Type of study	Country
Dotger (2010)	13	MS/HS (92.3), EL (7.7)	Female (84.6), Male (15.4)	W/C (75.0), BI (7.0), A/A (6.0), H/L (12.0)	Pres. Info.	CPPS, CAW, FEA	Attitudes	Journal article	USA
Fantuzzo et al. (1996)	48	EC (100)	Female (91.0), Male (9.0)	NR	Pres. Info., Field Exp.	HBI, CS, FEA	Attitudes	Journal Article	USA
Gartmeier et al. (2015)	96	NR	Female (68.0), Male (32.0)	NR	Pres. Info., Hyp./ Sim.	CPPS, CS, HBI, FEA	Attitudes	Journal article	USA
Hardin et al. (2010)	48	EC (100)	NR	NR	Pres. Info., Field Exp., Coach./Sup.	CPPS, CS, SBI, FEA	Attitudes	Journal article	USA
Hays (2005)	30	EL (56.7), HS/MS (33.3), Music (10.0	Female (90.0), Male (10.0)	W/C (86.6), BI (3.3), H/L (3.3), Oth (6.6)	Pres. Info., Hyp./Sim.	CAW, P-T, SBI, FEA	Attitudes, Knowledge	Dissertation/ thesis	USA
Hoover-Dempsey et al. (2002)	52	EC (21.5), EL (52.0), SPED (26.5)	Female (80.8), Male (19.2)	W/C (65.4), BI (34.6)	Pres. Info., Hyp./Sim.	CPPS, P-T, FEA	Attitudes	Journal article	USA
Hornby (1990)	46	SPED (100)	Female (95.0), Male (5.0)	NR	Pres. Info., Hyp./Sim.	CS, P-T, SE, FEA	Attitudes	Journal article	Britain
Jacobbe, Ross, and Hensberry (2012)	67	EL (100)	Female (95.6), Male (4.4)	W/C (83.8), BI (2.9), A/A (2.9), H/L (10.4)	Pres. Info., Field Exp.	CPPS, CS, HBI, SBI	Attitudes	Journal article	USA
Kim (2006)	53	SPED (100)	NR	W/C (77.5), BI (9.4), AI (5.1), H/L (7.5)	Pres. Info.	CPPS, SE, FEA	Attitudes, Knowledge	Dissertation/ thesis	USA
Kim and Vail (2011)	83	SPED (100)	Female (58.5), Male (41.5)	NR	Pres. Info., Hyp./ Sim.	CAW, P-T, SBI	Attitudes	Journal article	USA

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Author (year)	Sample size	Specialization/ position (%)[a]	Gender	Ethnicity[b]	Method delivery	TTP components[c]	Outcomes	Type of study	Country
Lam (2005)	142	SPED (26.1), Deaf Ed. (7.0), School Counselors (32.5), School Social Workers (7.7)	Female (78.0), Male (22.0)	W/C (38.0), Bl (4.0), A/A (20.0), H/L (30.0), AI (1.0), Oth (7.0)	Pres. Info., Field Exp.	CAW, P-T, FEA	Attitudes, Knowledge	Journal article	USA
Longley (1998)	26	EC (11.4), EL (89.6)	Female (84.6), Male (15.4)	W/C (70.1), Bl (6.9), Oth (23.0)	Pres. Info.	CS, CAW	Attitudes, Practices	Dissertation/ thesis	USA
Maier (1995)	26	EL (100)	NR	NR	Pres. Info., Hyp./Sim.	CPPS, P-T	Practices	Dissertation/ thesis	USA
McCollough and Ramirez (2012)	72	EL/MS (100)	NR	NR	Pres. Info., Field Exp.	CAW, FEA	Attitudes	Journal article	USA
Mehlig and Shumow (2013)	19	EL (100)	Female (89.5), Male (10.5)	NR	Pres. Info., Hyp./Sim.	CS, CPPS	Knowledge	Journal article	USA
Morris and Taylor (1998)	105	EL (80.0), EC (20.0)	NR	NR	Pres. Info., Hyp./Sim., Field Exp.	CS, CAW, SBI, P-T	Attitudes, Knowledge	Journal article	USA
Morris, Taylor, Knight, and Wasson (1996)	31	EL (96.7), EC (3.3)	Female (100)	W/C (74.2), Bl (22.6), A/A (3.2)	Pres. Info., Hyp./Sim., Field Exp.	CS, P-T, CAW, SBI	Attitudes, Knowledge	Journal article	USA
Murray and Curran (2008)	26	SPED (100)	Female (80.8), Male (19.2)	W/C (81.5), Oth (18.5)	Pres. Info., Field Exp.	CS, P-T, SBI, CAW	Knowledge	Journal article	USA

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Author (year)	Sample size	Specialization/ position (%)[a]	Gender	Ethnicity[b]	Method delivery	TTP components[c]	Outcomes	Type of study	Country
Murray, Mereoiu, and Handyside (2013)	19	SPED (36.8) School Psych. (63.2)	Female (84.2), Male (15.8)	W/C (100.0)	Pres. Info., Hyp./Sim., Field Exp.	CAW, CPPS, P-T	Knowledge	Journal article	USA
Patterson, Webb, and Krudwig (2009)	89	SPED (100)	Female (83.1), Male (16.9)	W/C (79.7), Bl (14.6), Oth (6.7)	Pres. Info., Hyp./Sim.	SBI, CPPS, P-T, FEA	Attitudes, Knowledge	Journal article	USA
Pretti-Frontczak, Giallourakis, Janas, and Hayes (2002)	19	EC (100)	NR	NR	Pres. Info., Field Exp.	CS, P-T, CPPS, FEA	Attitudes	Journal article	USA
Ramirez, McCollough, and Diaz (2016)	95	Math/Science (100)	NR	H/L (95.0), Oth (5.0)	Pres. Info., Field Exp.	CAW, FEA	Attitudes	Journal article	USA
Rohr and He (2010)	25	EL (100)	NR	NR	Pres. Info., Field Exp.	SBI, P-T, FEA	Attitudes	Journal article	USA
Smith (2010)	100	EL (100)	Female (71.0), Male (29.0)	NR	Pres. Info., Field Exp.	CPPS, CAW, CS	Attitudes, Practices	Dissertation/ thesis	USA
Symeou, Roussounidou, and Michaelides (2012)	111	EL (81.1), EC (6.3), MS (12.6)	Female (85.6), Male (14.4)	NR	Pres. Info., Hyp./Sim. Field Exp.	CS, P-T, FEA	Attitudes, Practices	Journal article	Cyprus
Tichenor (1998)	257	EL (84.8), EC (15.2)	Female (89.1), Male (10.9)	NR	Pres. Info., Field Exp.	CAW, CS	Attitudes, Knowledge	Journal article	USA
Trotti (2008)	78	EC/EL (88.0), Family Studies (12.0)	Female (97.4), Male (2.6)	W/C (83.0), Bl (11.0), H/L (2.0), Oth. (4.0)	Pres. Info., Hyp./Sim.	P-T, CPPS	Attitudes, Knowledge	Dissertation/ thesis	USA

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Author (year)	Sample size	Specialization/ position (%)[a]	Gender	Ethnicity[b]	Method delivery	TTP components[c]	Outcomes	Type of study	Country
Vacco (2002)	19	SPED (45.5), EC (27.2), EL (18.2), Other (27.3)	Female (100.0)	NR	Pres. Info., Field Exp.	CS, CPPS, FEA	Attitudes	Dissertation/ thesis	USA
Walker and Dotger (2012)	111	EL (100)	Female (74.4), Male (25.6)	W/C (86.5), BI (6.4), H/L (2.8), Oth. (4.3)	Pres. Info., Hyp./Sim.	CS, CAW, CPPS	Attitudes	Journal article	USA
Warren, Noftle, Derin Ganley, and Quintanar (2011)	26	EL/MS (100)	NR	NR	Pres. Info., Hyp./Sim.	P-T, CS, SE, FEA	Attitudes	Journal article	USA
Zygmunt-Fillwalk (2006)	132	EC (19.2), EL (75.6), EC+EL (2.6), SPED (2.6)	Female (91.1), Male (8.9)	NR	Pres. Info., Hyp./Sim.	P-T, SBI, CS	Attitudes, Practices	Journal article	USA
Zygmunt-Fillwalk (2011).	60	EL (81.7), EC (18.3)	NR	NR	Pres. Info., Hyp./Sim.	P-T, SBI, CS	Attitudes, Practices	Journal article	USA

TTP = teacher-training program.
[a]EC = early childhood; EL = elementary; MS = middle school; HS = high school; SPED = special education.
[b]AI = American Indian/Native American; A/A = Asian American; BI = Black/African-American; H/L = Hispanic/Latino; Oth = Other; W/C = White (Caucasian).
[c]CS = communication strategies; CPPS = collaborative planning and problem solving; CAW = cultural awareness/working with diverse populations; HBI = home-based involvement; FEA = family engagement attitudes/beliefs; P-T = Parent–teacher relationship; SBI = school-based involvement; SE = school environment; Pres. Info. = Presented Information; Hyp./Sim. = Hypothetical/Simulated experiences; Field Exp. = Field Experience.