



Early Childhood Personnel Center

# Systematic Review of Models of State Agency and Institutions of Higher Education Practices Leading to Alignment of Preservice and Inservice Training for Early Childhood Interventionists



## Literature Synthesis 2



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**Table of Contents**

INTRODUCTION ..... 1

PURPOSE ..... 5

METHOD ..... 7

SEARCH CRITERIA ..... 7

SEARCH METHODS ..... 7

DATA CODING AND ANALYSIS PLAN ..... 8

RESULTS ..... 9

DISCUSSION ..... 9

LIMITATIONS ..... 13

CONCLUSION ..... 13

REFERENCES ..... 15

**List of Figures**

1. STUDY INCLUSION DECISION TREE ..... 30

**List of Appendices**

APPENDIX A: PRISMA CHECKLIST ..... 31

APPENDIX B: ANNOTATED BIBLIOGRAPHY OF ARTICLES FOR WHICH FULL TEXT WAS  
EXAMINED ..... 33



## INTRODUCTION

Early childhood services have been provided by state and local agencies for over 100 years, and services for young children with disabilities for more than 50 years (Smith & Rous, 2011). Despite this long history, attention to the needs of young children has been rapidly increasing in recent years (Kagan & Kauerz, 2012; National Governor’s Association, 2010; World Health Organization, 2012); resulting in unprecedented growth in the field of early childhood intervention (Brown & Guralnick, 2012; Bruder & Guralnick, 2013; Kagan, 2013; Kagan & Britto, 2010). This growth in services has called attention to the need for an increasing number of interdisciplinary professionals to work with infants, toddlers, and young children with disabilities; however, states are struggling to build and maintain capacity.

Personnel shortages in early childhood are not new (e.g. Ludlow, Connor, & Schecter, 2005; Norris, 2010; Smith, Robb, West, & Tyler, 2010); however, in the past two decades, concerns have focused not only on the quantity of personnel available to provide early childhood intervention, but also, on the quality of the services provided (Bruder, 2010; Bruder, Mogro-Wilson, Stayton, & Dietrich, 2009; National Research Council, 2001). As a result, the topic of workforce development for those who staff programs for infants and young children with disabilities has received increased scrutiny (Bruder, Dunst, & Mogro-Wilson, 2011; Fowler, Yates, & Ostrosky, 2011; National Governor’s Association, 2010; Snyder, Hemmeter, & McLaughlin, 2011; Snyder et al., 2012; Winton & McCollum, 2008; Zaslow, 2009), with discourse noting the wide variability in the education, training, and credentialing for professionals in the early childhood workforce (Barnett, Carolan, Squires, & Clarke Brown, 2013; Bruder, Mogro-Wilson, Stayton, & Dietrich, 2009; National Research Council, 2001). As suggested by Bruder et al. (2009), some of this variability can be attributed to the wide array of disciplines involved in early childhood intervention, which includes teachers, special educators, nurses, speech language pathologists,

psychologists, occupational therapists, and physical therapists. Each discipline has its own preservice educational requirements, licensure or certification standards, and service delivery models (Bruder et al., 2009). Discrepancies in educational and training requirements for this diverse workforce, however, transcend interdisciplinary differences, extending to wide variation in standards for practice and credentialing across state lines and between the state organizations, professional practice organizations, and institutions of higher education (IHEs) responsible for ensuring the competence of those working with infants, toddlers and young children.

One of the most significant areas of discrepancy in the training of early childhood professionals is the degree to which training focuses specifically on standards of care for infants and young children. In many disciplines, licensure allows service providers to practice across the age span (e.g. nurse, occupational therapist, physical therapist, speech and language pathologist), with no specific requirements for knowledge of best practice specific to infants and toddlers. These broad licensure standards, however, mesh uneasily with Parts C and B 619 of the Individuals with Disabilities Education Act (IDEA) amendments of 1997, which detail specific requirements and standards for early childhood intervention services, such as family centered practices, teaming across disciplines, and service coordination (Bruder et al., 2009). A confound to this problem are the research that suggest IHEs may not adequately address these child-specific practices in their preservice programs of study (Ackerman, 2004; Bruder, 2005), resulting in a workforce unprepared to meet the requirements of services delivered under IDEA. For example, recent data published by the Department of Education's Institute for Education Science (Fiore, Nimkoff, Munk, & Carlson, 2013) indicated that in 2006-2007, only 11% of personnel preparation programs funded by the US Department of Education, Office of Special Education Programs (OSEP) included a focus on interdisciplinary practice, and more recently another examination of 177 funded early childhood personnel preparation programs( identified through the OSEP Discretionary Grants Public Database (DGPD; <http://publicddb.tadnet.org/Default.aspx>) documented only 6% of grants were

identified as providing an interdisciplinary course of study. Additional national examinations of IHE programs of study in early childhood intervention (Bruder & Dunst, 2005; Chang, Early, & Winton, 2005) and state agencies involved in training the early childhood workforce (Bruder et al., 2009) likewise suggest a lack of attention and congruence to national standards.

In addition, it has been determined that that state licensure or certification to practice as a professional in a discipline does not always align with the national standards for that discipline (e.g., Li & Fiorello, 2011; Stayton, Smith, Dietrich, & Bruder, 2012). For example, the Council for the Accreditation of Educator Preparation (CAEP; formerly the National Council for Accreditation of Teacher Education) accreditation for early childhood special education programs in higher education institutes requires the alignment with the professional preparation standards for special educations of the Council for Exceptional Children (CEC). This set of CEC standards is informed by the early childhood specialty set of knowledge and skills developed by the Division for Early Childhood (DEC; Miller & Stayton, 2005). These standards include skills and competencies across areas of evidence-based practice such as foundations, collaborations, language, assessment, instructional planning and strategies, learning environments, social interactions, development and characteristics of learners, individual learning characteristics, and professionalism and ethics. These have been field validated (see Cochran et al., 2012) and aligned with personnel standards developed by the National Association for the Education of Young Children (Chandler et al., 2012). As these personnel standards guide the curriculum of early childhood teachers graduating from CAEP accredited institutions of higher education, it is important that state certification and licensing systems reflect these standards in their requirements to practice as an early childhood special education teacher. Other disciplines have additional challenges in regard to meeting competencies specific to working with young children with disabilities identified by the discipline's national organization.

Confounding this lack of alignment between national and state personnel standards is the fact that states and higher education programs do not all use a national accreditation system and standards to guide their curricula. National surveys suggest this lack of congruence has had a negative effect on services delivered to infants and young children with disabilities and their families. This has been reported by practitioners (Bruder & Dunst, 2005, 2008; Bruder et al., 2011; Bruder, Dunst, Mogro-Wilson & Stayton 2013; Dunst & Bruder, 2013) as well as families of children in early childhood intervention (Bruder & Dunst, 2014). Additional national examinations of higher education curricula (Bruder & Dunst, 2005; Chang, Early, & Winton 2005) and state professional development systems (Bruder et al., 2009) also suggest a lack of attention and congruence to national standards. As an example, recent data published by the Department of Education's Institute for Education Science (Fiore, Nimkoff, Munk, & Carlson, 2013) suggests that that only 11% of personnel preparation programs across disciplines funded by the US Department of Education, Office of Special Education Programs (OSEP) in 2006-2007 had a focus on interdisciplinary competencies. A recent examination of 177 currently funded early childhood personnel preparation programs identified through the OSEP Discretionary Grants Public Database (DGPD; <http://publicddb.tadnet.org/Default.aspx>) suggested this situation is declining with only 6% of grants clearly identified as having interdisciplinary course of study.

In examining reasons for the lack of evidence-based practice in professional development for early childhood intervention, Bruder (2010) suggested there is a lack of a systemic process to enhance the skills of practitioners to implement evidence-based practices and collect outcome data documenting the effectiveness of services for children and families. Snyder and colleagues (2011) recent review of the early childhood and early childhood intervention professional development landscape reinforces the need for a comprehensive system of professional development through their findings that there is limited empirical research to guide policy makers and practitioners about the ingredients of professional development that demonstrate the most promise for supporting early childhood practitioners to impact



child and family outcomes. They recommended the need to identify structural and process features of professional development, specify theories of action or change, conduct experimental studies, analyze active ingredients of the professional development intervention, and examine costs.

To assist the field to identify the ingredients of high quality professional development, the National Professional Development Center on Inclusion (Buysse, Winton, & Rous, 2009) proposed a definition of professional development as follows: “Professional development is facilitated teaching and learning experiences that are transactional and designed to support the acquisition of professional knowledge, skills, and dispositions as well as the application of this knowledge in practice” (p. 3). However, this definition must be further operationalized when trying to ascertain intervention effects on child and family outcomes, and how this intervention practice is taught to service providers effectively and efficiently. While none would dispute the critical importance of professional development to the field of early childhood intervention, it is unclear if the implementation of high quality professional development to assure positive outcomes for children and families has been adequately addressed (Snyder et al., 2011). Moreover, while theoretical models and best practices for personnel preparation for individuals working with young children with disabilities have been proposed (e.g., McCollum & Catlett, 1997; Snyder, Denny, Pasia, Rakap, & Crowe, 2011), it is unclear if experimental work has been conducted to verify which practices are effective. In order to inform policy surrounding best methods for personnel preparation in early childhood education, experimental demonstrations of innovative practices and techniques leading to a more prepared workforce are needed.

## **PURPOSE**

The Early Childhood Personnel Center at the University of Connecticut has objectives to meet as detailed in a cooperative agreement with OSEP of the US Department of Education. Objective 4 under

“generate new knowledge and useful resources for early childhood personnel serving children with disabilities and their families” states:

(4) In the first year of the project period, conduct a review of the literature on components of successful:

- a) Models of State agency and institutes of higher education partnerships that have led to the alignment of State personnel standards and competencies and the curricula at institutes of higher education; and the alignment of preservice and inservice training.
- b) Models of coordination at a systems level to promote a more integrated early childhood professional development system for personnel working with infants, toddlers, and preschool children with disabilities and their families. The standards for the literature review must be consistent with those used by the What Works Clearinghouse and the definitions of “strong evidence” and “moderate evidence” contained in the notice of final supplemental priorities and definitions for discretionary grants programs, published in the Federal Register on December 15, 2010 (75 FR 78486), and corrected on May 12, 2011 (76 FR 27637).

Therefore, the purpose of this report was to systematically review the experimental evidence of methods or practices that align state agency and institutes of higher education preservice and inservice training to meet objective 4(a).

## METHOD

The methods used in this review are consistent with the highest level of rigor for systematic reviews as outlined by multiple organizations including the Cochrane and Campbell Collaborations (e.g., Higgins & Green, 2008), What Works Clearinghouse (What Works Clearinghouse, 2014), and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Liberati et al. 2009; Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009). A detailed review protocol, which per these standards was created prior to conducting this review, is available from the Early Childhood Personnel Center upon request, and a completed PRISMA Checklist is provided in Appendix A.

## SELECTION CRITERIA

For this review, we included studies meeting the following inclusion criteria. First, the study met What Works Clearinghouse Version 3.0 (What Works Clearinghouse, 2014) design standards (i.e., randomized controlled trial, single-case designs, and regression discontinuity designs). Second, the study described an experimental manipulation of state agency or institutes of higher education practices designed to align preservice and inservice professional development. Third, the study involved a population of personnel consistent with the target population of the personnel preparation center for which this review was conducted (i.e., early childhood personnel). Finally, the study was conducted in the United States of America (including territories).

## SEARCH METHODS

We searched five electronic databases (Academic Search premier, CINAHL Plus, Education Research Complete, Education Resources Information Center, and PsycINFO) using the EBSCO Plus

interface. We searched the databases during the second week of January 2014 using a combined search of all databases simultaneously using the following strategy:

1. “higher education” OR college\* OR universit\* OR “community college\*”
2. “early childhood education” OR preschool OR “head start” OR “early intervention”
3. teacher\* OR professional\* OR educator\* OR personnel
4. model OR models OR “cooperative planning” OR “interprofessional collaboration”
5. "state agency" OR "state departments of education" OR "state department\*" OR "state board of education" OR "state government" OR (state AND early intervention)
6. 1 and 2 and 3 and 4 and 5
7. preservice OR pre-service OR inservice OR in-service OR training\* OR “professional development” OR “teacher preparation”
8. 6 and 7

We imported complete records into EndNote for deduplication and title/abstract screening. One coder initially screened all titles to exclude clearly irrelevant articles. After screening, two coders independently reviewed the remaining 809 titles and abstracts for possible inclusion. After this second screen, 55 articles remained, which were then examined through full paper examination.

## **DATA CODING AND ANALYSIS PLAN**

We planned to conduct both narrative and descriptive reviews of studies meeting inclusion criteria by having two independent coders extract data on multiple descriptive variables (e.g., population, location, type of study, experimental characteristics) and outcome measures (e.g., accomplishment of alignment of state agency and institution of higher education preservice and inservice training, changes in preservice programs, changes in personnel competence, changes in personnel qualifications) for each

study. We also planned to assess study level risk of bias using an adaptation of the Cochrane Collaboration's risk of bias tool (Higgins & Altman, 2008) for group research design studies incorporating concerns for inclusion of non randomized studies (e.g., Reeves et al., 2013) and an adaptation of the tool for single case design studies (Reichow, Barton, and Maggin, 2013). We also planned to evaluate methodological quality using the standards contained in Version 3.0 of the *What Works Clearinghouse Procedures and Standards Handbook* (What Works Clearinghouse, 2014). Had enough studies be located with similar practices and outcomes, we planned to synthesize the results using meta-analysis. Where possible, graphical analyses (e.g., harvest plots, forest plots) of outcome data would have also been created and analyzed, and if possible, sub-group analyses would have been conducted (either through meta-analytic techniques or visual analyses of graphic displays).

## RESULTS

We located 23,810 records through the database search; 15,107 records remained after deduplication and 809 articles remained after the initial screening of titles and abstracts. After the second title and abstract screening, 55 articles remained. After examination of the full papers of these 55 articles zero articles met inclusion criteria. A PRISMA flow diagram (Moher et al., 2009) is shown in Figure 1. Because no articles met inclusion criteria, we prepared a table describing the 55 studies that were given a full-text examination, which is shown in Appendix B.

## DISCUSSION

This review sought to locate and synthesize the evidence on the effectiveness of state agency and institutions of higher education practices leading to alignment of preservice and inservice training. Unfortunately, we did not locate any studies meeting our inclusion criteria. This suggests that while many

have advocated for the alignment of state agency and institutions of higher education practices with respect to preservice and inservice personnel preparation (McCullum & Yates, 1994), evidence that such practices lead to improved personnel competencies and capacities have not been documented empirically. Given the increasing number of early childhood programs and the need for more early childhood providers, establishing the most effective methods for achieving a competent workforce are greatly needed. In order to establish the most effective methods, rigorous experimental studies in this area are clearly needed. These studies can be accomplished using multiple research methods to help provide a broad sense of best practices and the effects that might be achieved if state agencies and institutes of higher education align preservice and inservice training offerings and initiatives. Regional partners (states within close proximity) might also consider partnerships in which implementation of alignment practices are staggered to provide a natural control group for comparative purposes.

While we did not find experimental studies meeting our inclusion criteria, we did examine studies in our full paper evaluation of different methods of professional development (see Appendix B). One of the most frequent methods involved the use of distance learning and hybrid distance and face-to-face preparation programs. Research involving these techniques has shown that distance education, especially in instances where travel to a university campus is prohibitive, can be a cost-effective means for increasing the number of trained professionals (Deardorff, Glasenapp, Schalock, & Udell, 2007; Huebner & Prickett, 1996; Ryan & Dennis, 2000). We also located a number of articles with a strong emphasis on improving distance learning through the use of technology, which has been used increasingly to allow instructors to view video of the students performing competencies in classrooms so that they are able to provide constructive feedback (e.g., Downer, Kraft-Sayre, & Pianta, 2009; Driscoll, Wang, Mashburn, & Pianta, 2011; Mashburn, Downer, Hamre, Justice, & Pianta, 2010). Another means of providing instructors the ability to assess student's performance of intervention competencies has also been accomplished using hybrid programs, in which much of the didactic coursework is delivered using

distance technology, but the critical aspects of the learning process such as practica and internships retain the integrity of face-to-face contact (e.g., Cegelka & Alvarado, 2000; Hardin et al., 2010; McLaren & Rutland, 2013; Powell & Diamond, 2013). While distance learning and online courses seem to be increasing, little is known about the effectiveness of distance education specific to preparing interdisciplinary professionals to work with young children who have disabilities and their families. Moreover, Powell and Diamond (2013) recently found differences in the content and quality of feedback delivered online and on-site coaching. Thus, this is an area clearly in need of more research.

Another trend we noticed in the papers we reviewed was an increase in the number of two-year degrees and paraprofessional credentialing programs. Just as distance education is being used more frequently in rural areas, two-year degree programs also have the potential to alleviate some of the shortage of professionals in such areas. For example, Chopra and colleagues used a variation of the train-the-trainers model to increase the number of trained special education paraprofessionals in rural areas of Colorado, although they noted the program was not cost effective and did not adequately increase the number of trained personnel that were needed (Chopra, Banerjee, DiPalma, Merrill, & Ferguson, 2013). Another potential advantage of increasing two-year degree programs is the increased accessibility to the programs, especially for aspiring professionals from diverse backgrounds (e.g., Hinitz, 1998; Ignash & Slotnick, 2007; Kellegrew, Pacifico-Banta, & Stewart, 2008). Additionally, it has been suggested that two-year degrees and credentials might serve as a gateway to programs at four-year institutions (e.g., Ignash & Slotnick, 2007; McDonough, 2003), thus potentially having the effect of increasing the number of certified professionals who have the competencies to work with young children with disabilities. Ignash and Slotnick (2007) noted that in a survey of the 50 states, only 15 states had articulation agreements easing the transfer of credits between colleges for teacher education programs. Although some studies have shown positive effects for the creation of two-year associate degree and paraprofessional credentialing programs, Brotman, Kkngston, Bat-Chava, Caldwell, and Calzada (2008)

showed that while their 36-hour training program was able to increase knowledge and was met with high satisfaction ratings, participants reported no increase in their level of comfort in delivering a positive parenting program for preschool-aged children at risk for developing behavioral disorders. Given the increasing number of paraprofessionals working with young children receiving special education services, assessment of two-year programs to increase the knowledge, skills, and competencies of these service providers should be a high priority for future research.

A final theme we found in our analysis of the full articles were the establishment of collaborative networks between teaching professionals, state agencies, and institutes of higher education. Although we did not find evidence of efforts at aligning preservice and inservice training, we did locate descriptions of other efforts of collaborations between state agencies and institutes of higher education. Collaborative networks have been proposed as a way to reduce redundancies, establish common competencies and terminology, and improve efficiency (Bryan, DeBord, & Schrader, 2006; Fowler, Donegan, Lueke, Hadden, & Phillips, 2000; McCollum & Yates, 1994; Wesley & Buysse, 1996). Two early examples of statewide collaborations in early childhood intervention included the Partnerships Project in Illinois (e.g., McCollum & Yates, 1994) and North Carolina's Partnerships for Inclusion (e.g., Wesley & Buysse, 1996), which both showed coordinated efforts between institutes of higher education and state agencies can be designed, implemented, and have success. A more recent example (e.g., Carlson et al., 2012) described a statewide early childhood mental health collaboration in Michigan (i.e., Childcare Expulsion Prevision Program) that sought to promote health socioemotional functioning in infants and young children and to prevent future mental health challenges. This collaboration involved the Department of Human Services, Department of Community Health, Head Start, faculty from institutes of higher education, and a statewide partnership for early childhood, and described fidelity of implementation across 31 counties in Michigan. However, although we located examples of successful collaborations, Bledsoe-Mansori et al. (2013) suggest that such partnerships might not be occurring across all disciplines



involved for those working with young children who have disabilities. This finding highlights the need for further efforts in that area.

## LIMITATIONS

The primary limitation of this review was the failure to locate studies meeting our inclusion criteria. Although we conducted a broad database search in order to locate studies, we feel the lack of studies meeting inclusion criteria was largely due to our desire to locate experimental evidence of the effects of aligning state and institutes of higher education standards for preservice and inservice training. Our failure to locate studies might also be contributed to the narrow inclusion criteria of this review, which were stipulated in the performance agreement of the project for which this synthesis was conducted. Because we did not locate any studies meeting our inclusion criteria, we were not able to analyze methods of aligning preservice and inservice training across state agencies and institutes of higher education; thus, we are unable to provide an evaluation of best practice in this area.

## CONCLUSION

A workforce of early childhood interventionists who receive training at the institutes of higher education/preservice level to meet nationally recognized professional standards must be available to deliver effective early childhood intervention services. Unfortunately, this review did not identify any empirical literature to support alignments between state and institutes of higher education preservice and inservice training. This review demonstrated that there is no research in this area in early childhood intervention that would meet the What Works Clearinghouse Standards without reservation (What Works Clearinghouse, 2014). Yet, recommended practice would suggest that linkages to align state preservice and inservice standards should be made to improve the quality of professionals working with young children who have disabilities. Although we acknowledge that conducting research in this area might be

costly with significant logistical considerations that will need to be addressed, the results of this review suggest it is clear that research is needed in this important area.

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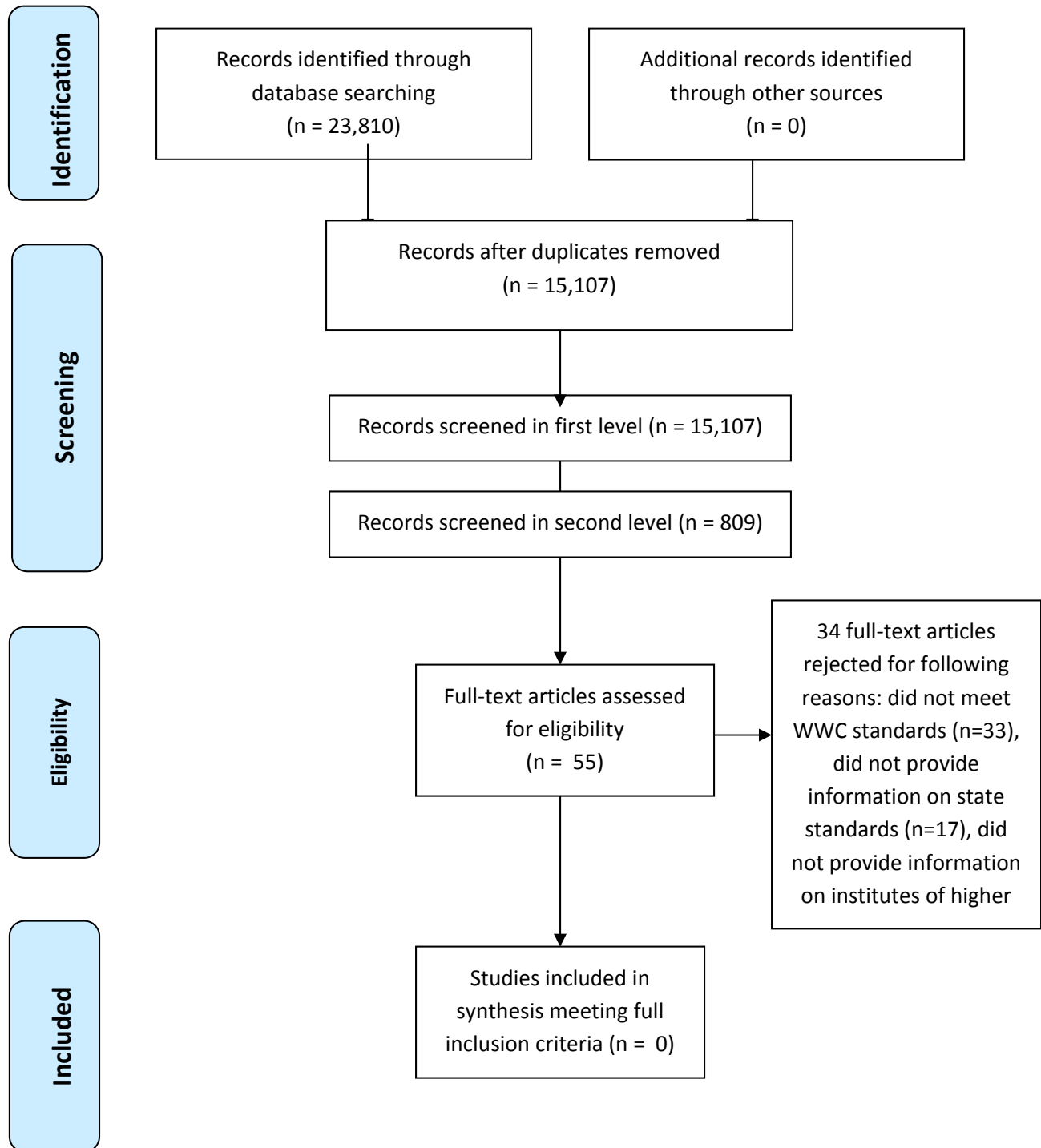
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Figure 1. Study inclusion decision tree (using PRISMA flow diagram, Moher et al., 2009)





## APPENDIX A. PRISMA CHECKLIST

Section/topic	#	Checklist item	Reported on page #
<b>TITLE</b>			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	n/a
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known.	2-6
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	6
<b>METHODS</b>			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	n/a
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	7
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	7
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	7-8
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	8
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	8-9

Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	8
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	8
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	8
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., $I^2$ for each meta-analysis).	8-9
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	9
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	9
<b>RESULTS</b>			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	9
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	n/a
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	n/a
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	n/a
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	n/a
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	n/a
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	n/a
<b>DISCUSSION</b>			

Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., schools, users, and policy makers).	9-13
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	13
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	13-14
<b>FUNDING</b>			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	1
<b>DISCUSSION</b>			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., schools, users, and policy makers).	9-12
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	12
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	12
<b>FUNDING</b>			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	1

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: [www.prisma-statement.org](http://www.prisma-statement.org).



## APPENDIX B. ANNOTATED BIBLIOGRAPHY OF ARTICLES FOR WHICH FULL TEXT WAS EXAMINED

Adams & Wolf (2008)	Strengthening the preparation of early childhood teacher candidates through performance-based assessments	This article described the development and implementation of performance-based assessments in the early childhood special education program at the University of Colorado Denver. Performance-based assessments consisted primarily of observation and rating of students in the early childhood special education program by practicum site supervisors and reviews of student portfolios that contained lesson plans, logs of contact hours, assessment instruments, and other evidence of meeting state and national standards. In total, nine performance-based assessments were implemented to assess student proficiency: assessment, challenging behavior, curriculum, intervention, literacy, mathematics, primary literacy, primary mathematics, and professional practice. Students were required to achieve a rating of proficient or advanced on a four-point scale for each performance-based assessment. The implementation of performance-based assessments in the early childhood special education program led to more detailed information about the skills and abilities of students in the program.
Autry, Lee, & Fox (2009)	Developing a Data-Driven Assessment for Early Childhood Candidates	The authors described the efforts of faculty in an early childhood education program at the University of Texas at Arlington to develop quantitative assessments and a portal system for teacher candidates based on national standards. The system contains a collection of documents intended to illustrate the progress of teacher candidates in the program. Course content was evaluated and altered using a rubric developed from NAEYC standards. Teacher candidates were evaluated in four domains: designing instruction and assessment to promote student learning; creating a positive, productive classroom environment; implementing effective, responsive instruction; assessment and fulfilling professional roles and responsibilities. These evaluations were conducted to determine how their pedagogical knowledge changed from program entry to program exit. Analyses indicated statistically significant improvement overall, with the greatest gains in designing instruction and assessment and implementing effective instruction.
Bagnato, McLean, Macy, &	Identifying Instructional Targets for Early Childhood	The authors reviewed the progress made in early childhood intervention over the last 25 years, stressed the importance of practice-based evidence, and argued for authentic assessment, curriculum-based measurement, and functional curriculum objectives. Incorporating these

Neisworth (2011)	via Authentic Assessment: Alignment of Professional Standards and Practice-Based Evidence	concepts into research, assessment and curricula should lend a higher degree of ecological validity to services provided to children and ultimately aid efforts at inclusion and increasing child competency. The authors also highlight critical issues in early childhood intervention moving forward, such as the increasing role of technology, advocacy for the elimination of high-stakes testing, and increasing professional development opportunities to address the shortage of qualified early childhood professionals.
Berzin & O'Connor (2010)	Educating today's school social workers: Are school social work courses responding to the changing context?	This article consisted of an analysis of school social work course syllabi in master's degree programs to determine how well trends in education have been incorporated in the preparation of school social workers. Syllabi were found to heavily emphasize clinical preparation and definition of the roles of social workers, while coverage of new practices such as evidence-based practice, response-to-intervention, positive behavioral support and No Child Left Behind was inconsistent. Authors proposed that course content be modified to include multilevel practice in the form of collaboration and community engagement, improvement of school culture, and strengthening of home-school partnerships.
Bartels & Eskow (2010)	Training school professionals to engage families: A pilot university/state department partnership	This article described the effects of a three-course graduate program designed to improve collaboration between early childhood professionals and families in high-need school systems. Participants completing the program indicated they had increased interest in working with families, a greater base of knowledge about how best to communicate with families, an intention to implement this knowledge in practice. A survey conducted with participants 6 months after completion of the program found that a majority had successfully increased their levels of interaction and communication with families. Effective programs such as this have the potential to serve as a model for other graduate courses designed to close the gap between policy and practice in emphasizing close teacher-parent relationships.
Bledsoe-Mansori et al. (2013)	Agency-university partnerships for evidence-based practice: A national survey of schools of social work	Partnerships between schools of social work and community agencies to promote evidence-based practice and empirically supported interventions offer a promising solution to the persistent gap between research and practice in the field of social work. A web-based survey was sent to all programs accredited by the Council on Social Work Education to determine the efforts of programs to incorporate evidence-based practices and empirically supported interventions. Efforts to promote these practices most commonly consisted of individual

		faculty members conducting evidence-based practice-related research and partnerships with field placement agencies to provide student training in evidence-based practices. Nearly all programs indicated some type of attempt to incorporate evidence-based practices, though lack of time, money and agency resources impeded these efforts. While the current attempts at forming partnerships between universities and community agencies are admirable, further efforts are necessary to ensure that partnerships are school-wide, rather than a result of individual faculty member's collaborations.
Breffni (2011)	Impact of curriculum training on state-funded prekindergarten teachers' knowledge, beliefs, and practices	This article described the effects of an 8-week course entitled "Best Practices in Prekindergarten Curriculum" for teachers in Florida's voluntary prekindergarten program. The course covered child development, developmentally appropriate instructional practice, alignment of curriculum with educational performance standards legislation and strategies for meaningful child assessment. From pre-test to post-test, teachers completing the course improved significantly on assessments in the areas of developmental milestones, curriculum instruction and assessment as compared to a control group. Measures assessing knowledge in child development theory fell short of significance. As treatment and control groups both contained teachers with and without bachelor's and associate's degrees, these results highlight the importance of curriculum training for all teachers of state-funded prekindergarten programs.
Brotman, Kingston, Bat-Chava, Caldwell, & Calzada (2008)	Training school personnel to facilitate a family intervention to prevent conduct problems	This article described the effects of a 36-hour training program designed to prepare professionals and paraprofessionals to administer a positive parenting intervention in a high-risk New York City school district to prevent conduct problems in preschool children. Participant knowledge of the ParentsCorps training program and its cognitive-behavioral strategies increased significantly following the training, and participants reported high levels of satisfaction with the program. Their ratings of comfort level in administering the program to parents in their community, however, did not increase. Despite the lack of increased comfort, this study describes a potentially efficacious training program that could ultimately reduce conduct problems in preschoolers in high-risk areas.
Bryan, DeBord, & Schrader	Building a professional development	This article outlined parent educators' attempts to coordinate the efforts of a number of statewide parent education initiatives and ultimately form the North Carolina Parenting Education Network. Through the network, common terminology, competency-based

(2006)	system: A case study of North Carolina's parenting education experiences	frameworks, and a professional credentialing system were established. While the network has succeeded in providing parent educators with a recognized credentialing system and other resources, full implementation of evidence-based practices into parent education curricula remains a need.
Carlson et al. (2012)	Implementing a statewide early childhood mental health consultation approach to preventing childcare expulsion	Authors described the implementation of the Childcare Expulsion Prevention Program, a statewide early childhood mental health consultation approach to preventing expulsion of preschool children from childcare programs in Michigan. The expulsion prevention project aims to identify and treat mental health problems in children from birth to 5 using a six-step socioemotional approach. Services are provided by masters-level professionals with at least 2 years of experience and Infant Mental Health Endorsements. Technical assistance is provided to these individuals in the form of email groups and monthly conference calls. The Childcare Expulsion Prevention Program provides an effective model of early childhood mental health consultation, with evidence supporting its ability to substantially reduce externalizing behaviors in preschool children.
Cegelka. & Alvarado (2000)	A best practices model for preparation of rural special education teachers	An alternative special education credential program was implemented in a rural 17-district region of California to address problems with attrition, retention, and employment of special education teachers without appropriate credentials. The program used a collaborative “coach-of-coaches” model to provide supervision and support to its interns, was locally available during the school year and offered summer sessions at a larger urban campus, and utilized external grant funding to offset costs for interns in the program. These features allowed interns to work towards becoming fully credentialed special education teachers while remaining primarily in their own districts. Of those completing the program, 85% remain special education teachers in the area, constituting a substantial improvement over previous retention rates and lending considerable support to the coach-of-coaches model for special education teacher preparation.
Compton, Niemeyer, & Michael (2004)	Auditory/oral birth-kindergarten teacher preparation: A research based model	Despite a shift toward auditory and oral communication in teaching children with hearing impairments, personnel preparation has tended to focus on manual communication. To address the deficit in personnel trained in auditory/oral communication, the University of North Carolina at Greensboro developed a research-based, interdisciplinary, family-focused program to train early childhood professionals to work with children with hearing

		<p>impairments through auditory and oral communication. Coursework was designed to include both theoretical and applied knowledge, train teacher candidates to facilitate a high degree of parent involvement and use assistive technology effectively. The program also included a practicum component. Challenges faced by the program included scheduling conflicts with interdisciplinary courses and insufficient numbers of student-teaching placements. Despite these issues, the Auditory/Oral Birth-Kindergarten Teacher Preparation Program at UNC Greensboro is addressing a growing need for auditory/oral communication personnel preparation programs.</p>
Chopra, Banerjee, DiPalma, Merrill, & Ferguson (2013)	Colorado's model for preparing paraprofessionals for rural early intervention programs	<p>Improved identification and screening methods for children with disabilities has increased demand for and qualified paraprofessionals providing early intervention services. In order to comply with the IDEA requirement that paraprofessionals undergo adequate training, Early Intervention Colorado implemented a "Training of Trainers" model to prepare licensed professionals to educate and supervise paraprofessionals. Community-centered boards provided two training programs: one to supervise developmental intervention assistant paraprofessionals, and another in which certain individuals received further training necessary for teaching paraprofessionals. While 39 participants had completed all requirements for a developmental intervention assistant certificate by the end of 2012, the training programs strained the resources of community centered boards, were not cost effective, and failed to educate many paraprofessionals in the rural areas they were most needed. Authors proposed utilizing community college networks to address these issues.</p>
Couse & Chorzempa (2005)	Service learning: Field experience for advanced early childhood degree candidates	<p>This article described the experiences of students as they completed a service learning component in an advanced degree teacher preparation program. The service learning experience was required as a part of courses in literacy and reading development from birth to kindergarten or preschool and kindergarten curriculum. Students were all certified teachers, many of them practicing within a 90-mile radius of the campus where they were taking courses. A three-phase model consisting of planning, implementation, and reflection was used. Projects were designed to be mutually beneficial to students and the community; examples included after school support programs and home literacy activity packs. Students reported that they were satisfied with the opportunity to undertake a project that would not fall under their normal teaching duties, and authors proposed that this program might serve as a</p>

		model for other advanced teaching courses.
Deardorff, Glasenapp, Schalock, & Udell (2007)	TAPS: An innovative professional development program for paraeducators working in early childhood special education	A new program called the Team Approach to Paraeducator/Supervisor Professional Development Model was implemented to address the shortage of early intervention professionals in rural areas. The model is a CD-based, self-directed program that each participant completes under the supervision of a professional. A needs assessment is conducted prior to the start of the program, after which the paraeducator and professional supervisor devise an individualized learning program according to role, knowledge, skills, and which models were most relevant to the individual's daily work. Examinations are conducted at the completion of each unit and upon completion of the course. Program satisfaction was high, and classroom observations indicated that paraeducators successfully transferred knowledge and skills taught in the course to the classroom. The Team Approach to Paraeducator/Supervisor Professional Development Model appears to constitute a cost-effective means of delivering quality, individualized instruction to paraeducators in early childhood special education in rural areas.
Diamond & Powell (2011)	An iterative approach to the development of a professional development intervention for head start teachers.	The authors described five separate studies implementing the coaching-based professional development program Classroom Links to Early Literacy. The first study involved a small group interview in which participating teachers offered their views on the best ways to teach phonological awareness and vocabulary. The second study paired coaching with the use of a laptop computer pre-loaded with text and video lessons describing evidence-based language and literacy instructional practices. The third study required participants to record videotapes of themselves teaching with specific instructional practices and submit them to coaches for feedback. Participants found this intervention to be particularly useful and made changes based on coaching feedback in subsequent lessons. Studies four and five consisted of a combination of site visits and coaching feedback based on submitted videotapes. The proportion of teachers completing all intervention activities was high, and participants were found to engage in more vocabulary instruction and were more active with students in large groups than control teachers. The iterative process for creating effective professional development programs was discussed, as was the increasing role of technology in the classroom.
Downer,	Ongoing, web-	This article described a two-year implementation of MyTeachingPartner, a web-based

Kraft-Sayre, & Pianta (2009)	mediated professional development focused on teacher-child interactions: Early childhood educators' usage rates and self-reported satisfaction	professional development model aimed at increasing the quality of teacher-child interactions in prekindergarten. Two groups were analyzed, one with web access to online instructional content and another with the same web access and biweekly contact with a consultant. Those in the consultancy group recorded themselves teaching and submitted recordings to the consultants for feedback, and also completed online journals throughout the course of the intervention. The consultancy group spent significantly more time utilizing online resources and found them more helpful than the web access only group, though both groups reported high rates of satisfaction with the resources. Web-based teaching resources and consultancy models offer many advantages over traditional professional development models and offer the types of instructional support that can improve the quality of teacher-child interaction and ultimately improve child outcomes.
Driscoll, Wang, Mashburn, & Pianta (2011)	Fostering supportive teacher-child relationships: An intervention implementation in a state-funded preschool program	Banking Time is an intervention designed to foster positive teacher-child relationships through the use of one-on-one meetings in which the teacher-child dyad participates in an activity of the child's choosing and the teacher observes, narrates actions, labels the child's emotions, and develops relational themes. The instructional content related to the Banking Time intervention was made available as a part of an implementation of a MyTeachingPartner professional development intervention. Teacher participants in this intervention were placed into one of three groups: consultancy, in which participants were contacted by a consultant twice weekly and kept an online journal, web access, in which participants had access to the same instructional web-based content as the consultancy group but without a consultant to provide feedback, and a control group. Results indicated that individuals in the consultancy group were significantly more likely to utilize the instructional materials and engage in Banking Time activities than participants in the other two groups. Overall, use of the Banking Time program was significantly associated with improved teacher-child interactions, which translated to improvements on achievement measures of the children they taught.
Epstein, & Dygdon (2006)	Using online psychological consultation in early childhood student teacher preparation	This article described a psychological consultation model implemented in an early childhood teacher education program at Roosevelt University in Chicago. Teacher candidates participating in student teaching practica had the opportunity to consult with a clinical psychologist with expertise in child behavior problems. These consultations were added to their typical meetings with professors about instructional methods and professional



		development issues. The psychologist made herself available in the form of an online message board where all teacher candidates were able to post questions and read answers the clinical psychologist had given to questions from other teachers. Qualitative analysis indicated that teacher candidates found the online consultation to be among the most helpful aspects of the student teaching experience, saved class time and preparation time, and allowed students to see similarities across educational settings. This type of online psychological consultation has the potential to serve as a model for similar tools in other early childhood education programs.
Farel, Bailey, & O'Donnell (1987)	A new approach for training infant intervention specialists	This article detailed a new two-year interdisciplinary master's program incorporating Maternal and Child Health and Public Health components to address the growing need for early intervention specialists trained in developmentally appropriate practices for high-risk infants and young children with disabilities. The program prepares individuals who are able to assess and plan interventions for children and their families and work as public policy advocates for families of children with disabilities. Programs such as this one help to meet the unique need for early intervention specialists with a diverse, interdisciplinary skill set that can be applied in a wide range of areas with the ultimate goal of providing appropriate services to infants and families quickly and efficiently in a rapidly evolving field.
Fisher, Frey & Nelson (2012)	Literacy achievement through sustained professional development	Authors described the effects of a professional development program that used a strategic instructional framework to improve literacy achievement. Instructional leadership teams were developed within each school in the district, consisting groups of six to eight teachers and the principal. These teams attended professional development sessions aimed at developing purpose and modeling to fit within the instructional framework. Leadership teams then returned to their individual schools and attempted to adapt this new knowledge to their unique settings. The process was repeated over the next three years with focuses on productive group work in classrooms, guided instruction, and increased teacher participation. Teachers reported being satisfied with the flexibility afforded by the new model, and successfully implemented many of the strategies they had learned in professional development sessions. As a result of the program, the majority of schools in the district met state standards for literacy achievement, with generalized improvement in math instruction.
Fowler, Donegan,	Evaluating community	Service delivery for young children with disabilities can become problematic when children turn three and are required to transition from the birth to three system to the three to five



Lueke, Hadden, & Phillips (2000)	collaboration in writing interagency agreements on the age 3 transition	system. Federal regulations require states to develop interagency collaboration agreements with the goal of preventing drop off in service delivery when children turn three. Local interagency councils are tasked with writing these agreements. The authors analyzed 29 interagency agreements and interviewed individuals contributing to their production. A majority of the documents included information on legal requirements associated with the transition such as obtaining parent consent to release child records, forwarding records from one agency to another, amending IFSP/IEPs, educating parents about the transition, and preparing children. A number of barriers to service delivery were described, including birthdays that occurred outside the school year, delayed payment for services, and poor adherence to state guidelines. However, the majority of agreement documents contained more information than was required by federal legislation, and it was often reported that collaboration in writing the agreement improved relationships between community agencies.
Galassi, Griffin, & Akos (2008)	Strengths-based school counseling and the ASCA national model	Strengths-based school counseling is described as it fits in with the national model of the American School Counselor Association. Specific components of strengths-based school counseling include an emphasis on context-based development, promoting students' strengths rather than aiming simply to prevent or reduce problem behaviors, holding school counselors accountable through outcome reports, and advocating for systemic change incorporating evidence-based practices. The authors propose that incorporating these elements into school counseling practice will better meet the needs of a student population that is increasingly diverse.
Gallagher, Vail, McCormick, & Malone (2001)	The Georgia higher education consortium: A model for linking early intervention faculty	This article describes efforts to develop a Higher Education Consortium in Georgia to help higher education faculty coordinate and support efforts in preservice and inservice training. The Georgia consortium aimed to make faculty in early intervention disciplines aware of the state's part C program, urged them to include early intervention competencies in courses, and sought input related to best practices in early intervention. Consortium meetings were held two to three times per year for five years. In impact surveys, a majority of faculty indicated that they were involved in early childhood personnel preparation activities and felt their university supported their membership in the consortium. In addition, the meetings increased their knowledge of state services and best practices in early intervention. They also facilitated networking among universities in the state with an emphasis on interdisciplinary

		collaboration. These relationships are especially important in rural states where a given faculty member may be the only person at his institution with knowledge or interest in early intervention. Faculty members are likely to incorporate knowledge gained at higher education consortium meetings in preservice and inservice professional development activities they conduct, with positive effects on statewide early intervention services.
Girolametto, Weitzman, & Greenberg (2012)	Facilitating emergent literacy: Efficacy of a model that partners speech-language pathologists and educators	The authors sought to determine the effects of a professional development program led by speech-language pathologists on teacher-child interactions through use of decontextualized language in shared reading and post-story writing activities. The program incorporated lectures, small group brainstorming sessions, feedback on videotaped literacy interactions between teachers and children, and individual coaching sessions. Educators and children in the experimental group receiving the professional development program used significantly more decontextualized language at post-test than the control group. These results constitute an extension on previous studies of the same professional development program without an individual coaching component in which decontextualized language did not improve from pre-test to post-test.
Han (2012)	Professional development that works: Shifting preschool teachers' beliefs and use of instructional strategies to promote children's peer social competence	The intervention described in this article was a teacher-driven, job-embedded, comprehensive approach to professional development aimed at giving teachers improved instructional strategies for the promotion of peer social competence in early childhood classrooms, which has been largely neglected in professional development to this point. Rather than a traditional lecture-based inservice format, the investigators developed collaborative workshops focused on topics in which teachers had expressed interest. Classroom observations were also conducted throughout the academic year to provide feedback and individualized support. Teachers expressed interest in quick problem-solving techniques rather than systematic approaches, indicated difficulty in interacting with parents, and said that they attempted to align lesson plans with state standards. Teacher-driven workshops were found to significantly improve teachers' belief in the feasibility of their instructional strategies. Teachers also became more willing to implement these strategies, and a significant correlation existed between feasibility and current use. These results provide support for the idea that professional development should be teacher-driven and job-embedded in order to ensure that teachers believe strategies are feasible and are willing to implement them in practice.

Hansen et al. (2004)	Developing a statewide faculty learning community program	The Ohio Learning Network is an agency funded by the Ohio Board of Regents with the goal of incorporating new technology into existing courses and programs at institutions of higher education in the state. The learning network began a learning communities initiative in 2002 with faculty learning communities at its center. Thirty-one faculty learning communities with a total of 250 members representing both public and private institutions met for a kickoff networking conference designed to inform members about the goals of the initiative and the basic concept of faculty learning communities. Projects designed by the communities were eligible for implementation funding from the Ohio Learning Network for projects designed to increase faculty knowledge and produce electronic resources for Ohio institutions. Specific emphasis was placed on creating interdisciplinary communities with the ability to effect structural change in educational settings. The faculty learning communities also conducted action research and case studies with the goal of continuously improving the practice of integrating technology in the classroom. Challenges encountered by the initiative included a lack of previous experience in learning communities and finding the time necessary to make funded projects a priority at each institution. Moving forward, approximately one-third of the funded projects had received continuation grants to attempt to implement more direct policy changes.
Hardin et al. (2010)	Teachers, families, and communities supporting English-language learners in inclusive pre-kindergartens: An evaluation of a professional development model	The unprecedented growth of English-language learners (ELLs) in schools in the United States has resulted in a shortage of personnel qualified to meet the needs of these children and their families. Early childhood educators must operate with a sound knowledge of dealing with each child's diverse social, cultural, and linguistic background, each of which plays a crucial role in development. The professional development model used in this study paired inservice trainings with interactive on-site coaching visits with the formation of action plans to implement culturally and linguistically relevant practices in their classrooms. Teachers reported high satisfaction with the content of sessions, expressed interest in what they had learned, and felt their questions were adequately answered. On-site coaching visits received similarly high ratings. At the conclusion of the program, teachers had more tools at their disposal and felt better prepared to work with ELL children and their families. Much of the success of the program was attributed to the on-site coaching aspect and action plan development aspects; the authors propose that more long-lasting interactive professional

		development programs increase the likelihood that teachers will implement changes intended to increase social, cultural, and linguistic sensitivity.
Harris, Steensen, Klotz, Skalski, & Bieber (2012)	Communities of practice: Creating the bilingual school mental health network in Colorado	This article outlines the development of the Bilingual School Mental Health Network, a community of practice recently created in Colorado to encourage collaboration among school psychologists addressing the needs of an increasingly diverse student population. Topic areas relevant to ELL addressed by the network include higher dropout rates, special education, gifted education, and poor academic achievement. The first meeting of the Bilingual School Mental Health Network was attended by 33 people from around the state; the group’s size has since increased to 85, with a 10-person leadership team helping to determine the direction of the group. Funded by the Colorado Department of Education, this community of practice provides an example of using innovative techniques to address problems in a student body with changing demographics.
Harvey & Voorhees (1997)	The role of the state department of education in promoting integrated placement options for preschoolers: Views from the field	Although inclusion of children with disabilities into classrooms with their peers without disabilities has been made a priority, the number of successful inclusion programs remains low. The authors conducted focus groups and phone interviews with stakeholders in programs that successfully integrated children with disabilities into classrooms with their peers without disabilities. Focus groups were conducted with individuals in a number of different roles across in districts of varying geographic settings and socioeconomic backgrounds. Qualitative analysis included recommendations by the focus group, including promoting integration in more school districts. Specifically, the focus groups emphasized the necessity of documentation of services, legal and policy information, funding options, and motivational information. Joint training of early childhood and early childhood special education programs, observation of up-and-running inclusive programs, and basic inservice training programs were also mentioned. Overall, there was a focus on blurring the line between early childhood education and early childhood special education, with all early childhood professionals ideally receiving training in both areas.
Hinitz (1998)	Credentialing early childhood paraprofessionals: The child	The author details the history of the Child Development Associate credential, initially developed in the early 1970s to meet increasing demand for qualified professionals to work in Head Start and other early childhood settings. Topics covered include key individuals participating in the task force responsible for the credential, determination of core

	development associate and other frameworks	competencies, stages of the credentialing process, the role of local assessment teams, specific goals and functional areas, and the shift to a council model for the Child Development Associate credential, with separate divisions for training and assessment. Critics of the credential cite an emphasis on performance over knowledge, disagreement about levels of competency, and questions about whether Child Development Associate-credentialed personnel would take the place of more qualified professionals who had completed 4-year programs. Other critics point to the fact that the credential only allows for entry into schools as a “paraprofessional”, with limited transfer of credits should the individual wish to complete a 4-year program. While some alternative credentialing programs such as the Head Start Supplementary Training and Certified Childcare Professional programs, the Child Development Associate credential remains the dominant certificate in early childhood education, and the program has succeeded in producing an ever-growing, skilled group of individuals with a coherent set of core competencies allowing them to care for and educate young children effectively.
Huebner & Prickett (1996)	A self-study and inservice training program for individuals who work with people who are deaf-blind	Fewer than twelve university-based preservice programs exist to train professionals to teach children who are deaf-blind, and the number of teachers graduating from these programs cannot keep pace with the increasing numbers of children in this population. The Deaf-Blind Project was developed to offer materials for teacher self-study and inservice trainers. These materials focused on communication and orientation and mobility and were developed for use by practicing teachers in the area of deafness or blindness/vision impairment. The primary resource was a 2-volume self-study course entitled “Hand in Hand: Essentials of Communication and Orientation and Mobility for Your Students Who Are Deaf-Blind.” Basic knowledge about deaf-blindness, effective ways to interact with and instruct deaf-blind children, ways to work with families, and access to resources for further learning opportunities were all included in the training material, and provided an effective means of training for the majority of teachers who work with children who are deaf-blind but do not have knowledge or skills in this area.
Ignash & Slotnick (2007)	The specialized associate’s degree in teacher education:	This article sought to determine the effectiveness of the Associate of Arts in Teaching as a stepping stone to 4-year degree programs. In a survey of all 50 states, 15 were found to have articulation agreements in teacher education programs designed to facilitate transfers to 4-year

	<p>Effective pathway or degree proliferation?</p>	<p>degree programs. However, the content covered in those programs as well as the title of the degree varied from state to state, creating a potentially confusing situation for teacher candidates. Although the Associate of Arts in Teaching is designed to eliminate this confusion by offering one degree and a streamlined transfer process, different concentrations (e.g. secondary math, science, etc.) call for different courses, resulting in the development of multiple degrees and perpetuating the confusion. One proposed solution is to offer one Associate of Arts in Teaching degree with multiple concentrations. Further clouding the picture are the necessity of meeting state and national standards, student teaching requirements, and the possibility that streamlined teacher education programs will not adequately address the teacher shortage due to retention issues. Despite its issues, the Associate of Arts in Teaching reduces time to degree and loss of credits upon transfer and thus remains an effective means of preparing new teachers.</p>
<p>Jimenez, Gerber, Hough, &amp; English (2005)</p>	<p>Training teachers to educate students with disabilities</p>	<p>The least-restrictive environment provisions of IDEA have resulted in a growing number of children with disabilities to be placed in general education classrooms. While this is a positive step, many general education teachers have not been adequately trained in special education. In this study, an interactive multimedia approach to problem-based learning was compared to traditional teaching methods in a course covering special education content in a graduate education program. Problem-based learning is a teaching approach in which students are presented with an issue or complex situation and encouraged to actively seek a solution by working closely with classmates and conducting research on the problem. The interactive multimedia approach presents the problem in an online module using video, audio, and links to websites and articles that may be helpful. In this study, students were randomly assigned to the interactive multimedia problem-based learning group or a traditional learning group based on lecture and small group discussion. At post-test, both groups had improved significantly in content knowledge, and differences between groups were nonsignificant. Although the results did not support interactive multimedia problem-based learning as an instructional strategy superior to traditional methods, students did report feeling a greater opportunity to take responsibility for their own learning. The focus of interactive multimedia problem-based learning on collaborative discussions and interactive learning may also be particularly effective in preservice/in-service training environments for general education teachers</p>

		acquiring skills and knowledge in special education to better facilitate inclusive practices.
Kellegrew, Pacifico-Banta, & Stewart (2008)	Training early intervention assistants in California's community colleges	The authors described California's Community College Personnel Preparation Project, developed to train early intervention assistants able to work under the supervision of a bachelor's or master's-level professional to help carry out interventions. Forty community colleges enrolled in the project. Enrollees were required to train faculty, design curricula, and organize field experiences to effectively train early intervention assistants to work in natural environments with children with disabilities. Of these 40, 22 were ultimately able to offer certificates at one of two levels (college certificate or Chancellor's certificate, required by Part C), 11 dropped out, and 7 were working towards completion at the time of this report. When faculty liaisons, professional development programs, and field placements were focused on early intervention rather than special education or child development, the program was more likely to have reached the higher-level Chancellor's certificate. The majority of colleges adapted current courses to new standards, rather than designing new courses. Challenges faced by colleges enrolling in the program included a lack of institutional support, insufficient professional development/faculty training, and difficulty finding placements for field work. Initiatives to create certificate programs such as this one offer a promising means of training early intervention assistants, but in order to be successful, schools need access to technical assistance specifically focused on early intervention to effectively train faculty and locate field placements for students.
Lake, Al Otaiba, & Guidry (2010)	Developing social skills training and literacy instruction pedagogy through service learning: An integrated model of teacher preparation	The authors used a service learning paradigm in which preservice teachers implemented either Tutor-Assisted Intensive Learning Strategies (TAILS) or Book Partners (BP) in an attempt to improve social competence and reading ability in struggling students. The TAILS program uses direct instruction to teach phonological awareness, fluency, and phonics in a sequential progression with review and practice components. The BP program trained preservice teachers to use strategies from coursework to teach similar principles in the context of the book in a less formal manner. At post-test, preservice teachers in the TAILS condition were found to provide more detailed biweekly reports of sessions with children, particularly when it came to reporting social behaviors. Children receiving TAILS instruction demonstrated more on-task and perseverant behavior, helped others and demonstrated learned social skills more often, and were more confident overall than children in the BP group. These results stressed to



		preservice teachers the importance of explicit literacy instruction and the connection between literacy and social skills as well as providing support for the inclusion of service learning in preservice training programs.
Landry, Swank, Anthony, & Assel (2011)	An experimental study evaluating professional development activities within a state funded pre-kindergarten program	A two-year intervention was conducted in 11 different communities to determine the effects of a comprehensive professional development program for early childhood educators in public school, Head Start, and childcare settings. Components of the program included online professional development courses, on-site teacher mentoring, teacher assessment of student progress, and implementation of research-based language and literacy curricula. The first year of the intervention consisted of one group receiving the comprehensive training program and a control group receiving no training, and the second year consisted of the intervention group receiving a second year of training and the group that had previously been the control group receiving the first year. The professional development program was found to be effective in changing teacher behaviors, though the effect of amount of time spent in the program (one or two years) was not significant. Students whose teachers participated in the program showed significant improvements in language and literacy skills over controls. Such results provide support for the use of comprehensive professional development programs that include online instruction, on-site mentoring, and the use of research-based curricula in early childhood education.
Landry, Swank, Smith, Assel, & Gunnewig (2006)	Enhancing early literacy skills for preschool children: Bringing a professional development model to scale	The authors described the implementation of a quasi-experimental, two-year intervention aimed at improving language and literacy outcomes for preschool children throughout the state of Texas. Of the 750 teachers across 20 sites, 500 were in the target group and 250 served as controls. In the first year of the intervention, the target group received training on instructional strategies developed to build the vocabulary, language skills, and phonological awareness of the preschoolers they were teaching. Skills covered included increasing motivation to read, teaching alphabet knowledge, and conducting effective book readings. Training was delivered in a 4-day summer workshop and was supported throughout the year by mentors and coordinators. The control group received no training. In the second year, the control group received the first year of training and the target group received a second year of training. Children’s language abilities improved more in classrooms receiving the intervention than control classrooms, and more for classrooms with teachers who had received two years



		of training than one. The effectiveness of the intervention was moderated by research-based literacy curricula, level of teacher education, and full-day versus half-day programs. The positive outcomes seen in this intervention could lead to its being used as a model for statewide early literacy professional development programs.
Liese, Clevenger, & Hanley (1999)	Joining university affiliated programs and schools of social work: A collaborative model for disabilities curriculum development and training	Given the emphasis of schools of social work on vulnerable populations, the lack of social work programs that strongly emphasize curricula focused on developmental disabilities is problematic. UCEDDs have been proposed as a means to address this deficit. Their unique combination of university affiliation, training resources, and expertise makes UCEDDs an ideal target for a collaborative partnership with schools of social work to promote increased emphasis on developmental disabilities in social work curricula. A survey was conducted to determine existing relationships between UCEDDs and schools of social work as well as the potential for new and improved relationships. 58 of 66 UCEDDs responded to the survey. Of the 58 respondents, 43 (74%) indicated an affiliated social work program at their university. Affiliations most often took the form of social work students having field placements or internships at the UCEDD or in developmental disability programs affiliated with the university (33, 77%), faculty and staff teaching developmental disability content in the social work program (21, 49%), or specific training in developmental disabilities offered by the UCEDD for social work students (28, 65%). Though these numbers are promising, many programs had no affiliation with their school's social work program, and almost half of UCEDDs had no affiliation with other universities with social work programs in their geographic vicinity. To further promote collaboration between UCEDDs and social work programs, the authors proposed the formation of a working group of social work and UCEDD representatives to create a best practices manual containing strategies for effective partnerships. Pairing social work programs with individuals at the same university with relevant expertise provides a common-sense solution to a pressing need in social work education.
Ludlow & Duff (2009)	Evolution of distance education at West Virginia University: Past	The authors provided a comprehensive review of the distance learning program in special education at West Virginia University, from its roots in the 1980s as a broadcast television service with assignments turned in through the mail to its most recent iteration, which includes streaming class sessions, online portfolio software, live video conferencing with

	accomplishments, present activities, and future plans	students and site supervisors, and presentation of all course materials through an online course companion called eCampus. Recommendations are then offered for both learners and instructors. For learners, questions of access to technology, strategies for success in distance learning courses, and use of available technical supports were discussed. Instructor recommendations included consideration of target audience, use of available technologies, designing content conducive to the distance learning format, and collaboration with colleagues. WVU’s distance learning program has been highly successful in continuing to adapt to new technologies and effectively deliver course content in one of the most rural areas in the United States, and therefore offers the potential for similar programs to benefit from lessons learned throughout its 30 years of existence.
Malone (2008)	Inquiry-based early childhood teacher preparation: The personal learning plan method	Learner-centered, inquiry-based approaches to personnel preparation might be particularly helpful in early childhood special education, where certification or licensure may not be a reliable indicator of highly skilled teachers. This article described the implementation one such approach, a Personal Learning Plan for early childhood education courses. The personal learning plan required each student to identify educational goals based on state and national standards, select and carry out activities in pursuit of those goals, turn in a product demonstrating their knowledge, and reflect upon the process in an evaluation. Preliminary plans with identified goals were due early in the semester, with students setting their own deadlines for activities and products. While a list of acceptable activities including home/site visits, classroom observation, and teacher interviews was provided, students were permitted and encouraged to come up with their own ideas. Students then completed formal reports documenting their activities and finally, reflected upon the process, considering their initial educational goals and how well the activities they selected met those goals. Despite initial discomfort with the degree of freedom they were afforded, students ultimately preferred the personal learning plan and its learner-centered approach to traditional didactic teaching methods. The increased time and effort required of both students and instructors posed a challenge, as did the adaptation to an unfamiliar learning structure. The personal learning plan method ultimately appeared to have a positive impact on the learning process, but the author calls for further study prior to widespread implementation.
Malone, &	Interdisciplinary	The interdisciplinary preservice specialization project was developed to qualify early

Straka (2005)	preservice specialization project: a model for early intervention personnel preparation	childhood personnel to deliver interdisciplinary services mandated by IDEA. Adding placements with young children with disabilities and their families to single-discipline university programs in child development, social work, and speech/language pathology, the interdisciplinary preservice specialization project prepared students to work in administrative and clinical roles. Program content was delivered to 15 students through interdisciplinary seminars, three 5-credit hour courses, field placements, and monthly meetings with faculty to discuss experiences. Pre-test/post-test comparisons were made for aggregate knowledge and each of 7 content areas and 66 individual competencies. Improvement in these areas was statistically significant with large effect sizes. Following the completion of the program, two of the three included courses remained in the curriculum and were adopted by the university's Institute on Disability, while the third course was dropped. Placement sites adopted some evaluation tools from the program, and others offered students who had completed fieldwork there positions after graduation. The interdisciplinary preservice specialization program provides a model for an effective early childhood education program that is truly interdisciplinary in nature and has demonstrated its ability to produce highly competent early childhood professionals.
Mashburn, Downer, Hamre, Justice, & Pianta (2010)	Consultation for teachers and children's language and literacy development during pre-kindergarten	This study described the effects of a web-based professional development program called MyTeachingPartner on the literacy skills of Pre-K children. Three groups were analyzed, one given access to literacy resources focused on six instructional targets, one with web access to those materials as well as online instructional content and another with the both resources in addition to biweekly contact with a consultant providing feedback based on videotaped teaching sessions. Children whose teachers were in the consultancy group showed greater improvements in receptive language than their peers whose teachers had been in the literacy activities or web material only conditions. Their receptive language development was also positively associated with the number of hours their teachers spent consulting. Number of hours spent on language and literacy activities was positively associated with improved development in that area. These results support the use of programs such as MyTeachingPartner to foster language and literacy development and stress the importance of consistent utilization of available supports.
McCullum	Technical assistance	This article described the Partnerships project in the state of Illinois. Partnerships is a

<p>&amp; Yates (1994)</p>	<p>for meeting early intervention personnel standards: Statewide processes</p>	<p>collaborative effort between state agencies and universities to provide effective technical assistance for meeting early intervention personnel standards. The project consists of three components. The first was a portfolio-based credentialing system in which personnel are allocated points based on years of experience, coursework, staff mentoring, continuing education, and other activities. Credentials for the early intervention specialization can also be attained through university-based study programs. The second goal of the Partnerships program was to provide specialized training that was accessible to all early intervention personnel and is not prohibitive in terms of its financial cost or geographic location. Options for participation in this training are demonstration training sites, staff mentoring, field validation, and tuition reimbursement. These activities allowed educators to earn points for their portfolios. The third goal of the Partnerships project was to expand training for early intervention personnel beyond an inservice model and create or improve early intervention programs at state colleges and universities. The project has succeeded in improving relationships among providers of technical assistance in the state, yielded new university courses in early intervention, and improved the credentialing process for early intervention personnel.</p>
<p>McCormick &amp; Brennan (2001)</p>	<p>Mentoring the new professional in interdisciplinary early childhood education: The Kentucky teacher internship program</p>	<p>The Kentucky Teacher Internship Program was developed as a year-long supervised internship experience for new teachers designed to increase competency, lower attrition rates, and provide constructive feedback to first-year teachers. Observation and portfolio-based assessment were used to determine eligibility for certification as first-year teachers implement teaching practices based on national standards. As a supplement to the K-12 teacher internship program, a specific set of standards was developed for interdisciplinary early childhood education teachers. The program put a principal, a resource teacher (primary mentor) and a teacher educator at the disposal of the intern. These individuals form the internship committee, which met with the intern at the conclusion of each of four observation cycles. The intern developed a portfolio and a professional growth plan to refine throughout the year and present to the committee. While the Kentucky Teacher Internship Program takes an innovative approach to fostering the development of new teachers, little data is available on its effectiveness for interdisciplinary early childhood education teachers. Other challenges included insufficient time dedicated to mentorship, an unwillingness of the intern to ask for</p>

		help, and poor intern/mentor matches. Despite these drawbacks, providing new teachers with a knowledgeable and supportive mentor as a resource, encouraging them to reflect on their practices and experiences in the classroom, and holding them accountable through portfolio-based assessments likely has a substantial impact on the program's stated goals of improving retention and developing committed and highly competent early childhood professionals.
McDonough (2003)	A new degree for the community college: The associate of arts in teaching	McDonough describes the efforts of Maryland's Teacher Education Articulation Committee to provide a means for teacher education students to easily transfer credits between two and four-year institutions, thus simplifying the process of beginning one's education at a community college and expanding the base of prospective teacher educators in Maryland. Committee members came from both community colleges and universities and took an outcome-based approach to the problem, setting out to determine what skills and knowledge an individual should have after two years of education, irrespective of institution. The common competencies would come to be known as the Associate of Arts in Teaching, qualifying individuals holding that degree to finish a bachelor's degree at a four-year institution. Reception to the newly-established degree has been positive, as it has the potential to increase the number of individuals pursuing teacher education as a career.
McDowell, Carroll, Ewing, & Alfred (2012)	Educational administration of an early childhood unified residency program	This article described Wichita State University's early childhood unified residency program, which allows students to obtain a master's degree and work towards licensure in Kansas for early childhood and early childhood special education. In addition to child development and pedagogy training and a research component, a supervised internship in which students work in an early childhood classroom is required for successful completion of the program. The ultimate goal in the development and implementation of the residency program was to train teachers with a wide range of knowledge and skills, increasing the likelihood that they would work long-term in urban schools where turnover rates are traditionally very high. Results from the first cohort were promising, with 100% of participants demonstrating proficiency in all areas in which they were assessed. Authors proposed that this program might provide an effective means of addressing teacher shortages in urban school districts like Wichita Public Schools.
McLaren, & Rutland	Preparing early childhood special	The shortage of early intervention and early childhood special education teachers is well documented, particularly in rural areas where rates of attrition for teachers are already high.

(2013)	educators in Appalachian Kentucky	Morehead State University developed a Master of Arts in Teaching program to provide an alternate (and accelerated) track for individuals holding a bachelor’s degree who were seeking to earn certification. In addition to coursework, clinical practica were also required of students in the program. Because of the workload associated with teaching full-time and completing coursework, students were allowed to complete practicum hours at least partially in their own classrooms. A distance learning course delivery method was incorporated so that students could complete some requirements online, though they still traveled to campus for weekly or biweekly meetings and workshops that took place on weekends or during summer months. Evaluation of program success is ongoing, but the benefits of reduced travel time for students and increased numbers of certified teachers are already apparent.
Morrison, Graden, & Barnett (2009)	Steps to evaluating a statewide internship program: Model, trainee, and student outcomes	This article described an evaluation of the state of Ohio’s school psychology internship program. 266 school psychology interns participated in a study that aimed to assess improvements in their skills over time as well as their impact on students. Field supervisors completed questionnaires containing items addressing these constructs at the beginning, midpoint, and end of student internships. Assessments of intern skills in six competency areas (use of assessment in problem-solving context, consultative problem-solving skills, academic intervention strategies, behavioral intervention strategies, use of data to monitor progress, and conducting professional development activities) reflected substantial increases in all areas over the course of the school year. Data suggested that interventions conducted by interns were largely successful in helping students attain academic and behavioral goals. This evaluation was effective in illustrating the increased competency of school psychology interns throughout the course of the year and in meeting national standards for greater levels of accountability in school psychology programs. As such, the model used here merits further study and possible application to other similar training programs.
Perigoe & Teller (2010)	The University of Southern Mississippi: Developing a state-of-the-art graduate program in early	The authors described a partnership between the University of Southern Mississippi and a nearby school for deaf and hard of hearing children culminating in the creation of a graduate program with a focus on listening and spoken language. After extensive research in best practices for listening and spoken language instruction, a curriculum was developed and approved by the university’s Office of Graduate Studies and the Mississippi Department of Education, resulting in the Master of Science in Education of the Deaf with a Concentration in

	oral intervention	Early Oral Intervention for Children who are Deaf and Hard of Hearing. The one-year program initially enrolled six full-time students who split time between classes at the university campus and practica at the school. Scores on a comprehensive examination improved substantially from pre-test (taken prior to the start of the program) to post-test (taken upon completion of the program). The new graduate program is the only one of its kind in the southeastern United States, and anticipates attracting new students from throughout the region as it expands to meet the urgent need for qualified professionals to work with children who are deaf and hard of hearing.
Piasta et al. (2010)	Impact of professional development on preschool teachers' print references during shared read alouds: A latent growth curve analysis	This study compared a professional development program focused on verbal and nonverbal print referencing in read alouds to an alternative form of professional development designed to improve emergent literacy. Eighty-five Pre-K teachers were divided into three groups: one high-dose print referencing, one low-dose print referencing, and one high-dose regular reading. All groups read 30 commercially available books to children over 30 weeks. Latent growth curve analysis showed that teachers who had received the print referencing professional development program used significantly more print references in read alouds than the group receiving alternative professional development. This finding supports the use of print referencing professional development models as a means to increase emergent literacy skills in early childhood.
Powell & Diamond (2013)	Implementation fidelity of a coaching-based professional development program for improving head start teachers' literacy and language instruction	The field of early childhood professional education has increasingly turned its focus to coaching and other individualized models of professional development in recent years, at least in part due to how well these practices align with best practice recommendations. While these types of programs offer substantial improvement over traditional inservice models, the majority of research on these models largely ignores questions of implementation fidelity. In this study, the authors assessed the implementation fidelity of a hybrid online and in-person coaching model of professional development for Head Start teachers. The program aimed to improve instruction of vocabulary knowledge phonological awareness skills during whole-class read aloud time. Coaches in the onsite group observed for 90 minutes and met with the teacher for 30 minutes to deliver feedback, while the online group of teachers submitted 10-15 minute videos of their teaching practices to coaches, who analyzed and responded to it. Overall fidelity of implementation was very high, but differences existed between on-site and



		<p>online coaching groups. On-site coaches were found to deliver more feedback regarding extension and individualization, while online coaches tended to focus more heavily on core practices. More unique feedback was presented to teachers receiving online coaching, whereas teachers in the online coaching group were more likely to receive the same feedback multiple times. Existing research provides strong support for coaching-based professional development as a whole, but this study extends on previous research in its focus on fidelity and its analysis of the distinct benefits of different types of coaching practices.</p>
<p>Ryan &amp; Dennis (2000)</p>	<p>Experiences and perceptions of rural Alaskan general educators: Implications for preparation in inclusive practices</p>	<p>A qualitative research study was conducted to describe participant experiences in an inservice distance learning program designed to help general education teachers and their special education assistants promote inclusive practices in remote Alaskan villages (all pop &lt;1000, none with access to road). Over the course of the two-year program, data was collected in the form of questionnaires, permanent products, audio conference tapes, individual interviews, and researcher field notes. Personal stories of participants were described as critically important in interpreting their experiences, as all participants had strong ties in the communities in which they taught. Despite the rural setting, teachers indicated many challenges to implementation of inclusive practices common to programs in other areas, including lack of time and funds set aside for the project, lack of institutional support, and a reluctance to change on the part of other teachers and the community as a whole. Teachers also described how their efforts at inclusion were influenced by Alaskan native culture, which may not promote collaborative efforts and frequent communication between parents, children, and teachers to the same extent as urban or suburban communities. The authors recommend that professional development programs such as this always be conducted with sensitivity to cultural values and beliefs of the communities in which they are conducted. This practice is especially important in settings like the one described here, where cultural identity is foundational to the daily lives of community members.</p>
<p>Wesley &amp; Buysse (1996)</p>	<p>Supporting early childhood inclusion: Lessons learned through a statewide technical assistance</p>	<p>Partnerships for Inclusion is a statewide technical assistance program in North Carolina that aims to provide training, promote positive attitudes about, and otherwise advocate for inclusion in early childhood education. The program was designed to provide a wide range of services, from raising awareness of the importance of inclusion to implementing specific practices in order to effect change in a number of different settings. Funding came from a</p>



	project	variety of state agencies, and three technical assistants were hired. An advisory board was also established. Partnerships for Inclusion recognized that each situation calls for a unique technical assistance solution, and despite its systems-level approach, did not attempt to implement the same practices in all settings. Technical assistants for the program facilitated this by encouraging each community to use a planning tool and conduct a needs assessment in order to be better served by the program. Other tools included hosting community forums and consulting with state policymakers. Authors also described the development of a comprehensive set of measures for program evaluation and used the results to make recommendations for components of effective technical assistance promoting inclusive practices in early childhood education.
Wright (2013)	Two steps forward, one step back: The Kentucky education reform act a generation later	The author described the sweeping changes made to the public school system in Kentucky as a result of the Kentucky Education Reform act, a product of the Kentucky Supreme Court case <i>ROSE v. Council for Better Education</i> that found almost all aspects of Kentucky's public school system unconstitutional. Though significant progress had been made by 2013, the majority of the schools meeting their proficiency targets were in high-socioeconomic status areas, with predominantly African-American and low-socioeconomic status schools lagging well behind. To some extent, the failure of these schools to make sufficient progress can be attributed to funding problems. Immediately after passage of the Kentucky Education Reform Act, schools enjoyed a substantial increase in funding. However, spending cuts, increasing teacher benefit costs, and inflation have all played a role in reducing available funds for academic purposes. While Kentucky's schools are still improving, much work needs to be done to contend with fiscal and other obstacles to the progress that must be made in order to be capable of effectively educating its children.