Systematic Review of Models of State Agency and Institutions of Higher Education Practices Leading to Alignment of State Personnel Standards and Competencies with Curricula at Institutions of Higher Education*

Literature Synthesis 1

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INTRODUCTION

Early childhood services have been provided by state and local agencies for over 100 years, and services for infants and young children with disabilities have been provided for over 50 years (Smith & Rous, 2011). Although there is a long history of providing these services, attention to the needs of young children has been on the rise 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, 2013; 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 in early childhood intervention; however, states are struggling to build and maintain this capacity.

Personnel shortages in early childhood are not new (e.g., Ludlow, Connor, & Schecter, 2005; Norris, 2010; Smith, Robb, West, & Tyler, 2010), however concerns are now focused on the quality of services performed by personnel \(Bruder, 2010; Bruder et al, 2009). As a result, systems of personnel development for those who staff programs for infants and young children with disabilities has come under scrutiny (Bruder, Dunst, & Morgo-Wilson, 2011; Fowler, Yates, & Ostrosky, 2011; National Governor's Association, 2010; Snyder, Hemmeter, & McLaughlin, 2011; Snyder et al., 2012; Winton & McCollum, 2008; Zaslow, 2009).

Many professional organizations have developed practice standards to ensure the competence of discipline specific professionals in the field of early childhood intervention (e.g. American Speech Language Hearing Association for speech pathologists providing speech therapy). Most of these standards are not age specific and allow professionals to practice

interventions to persons across the life span. In addition, recent studies have identified a lack of congruence between state workforce credentialing systems for a professional discipline and nationally validated personnel standards designed to ensure the competence of those in the early childhood workforce, Stayton, Smith, Dietrich, & Bruder, 2012).

National professional organizations, however, also oversee the accreditation of many discipline-specific programs within institutions of higher education (IHE), allowing opportunities to shape curricula and learning expectations to national standards of practice. The Council for the Accreditation of Educator Preparation (CAEP), for example, requires that personnel preparation programs in special education abide by the Professional Preparation Standards for Special Educators created by the Council for Exceptional Children (CEC). These standards address competencies identified by the CEC as necessary to the effective and safe practice of special education, such as knowledge and skills related to collaboration, assessment, and instructional planning, among others. Personnel training programs focused on early childhood special education, as well as blended programs in special education and early childhood teacher training, use the CEC professional preparation standards informed by the early childhood special education Specialty Set of Knowledge and Skills, which were developed by the CEC's Division for Early Childhood (DEC). The DEC field validated the specialty set (see Cochrane et al., 2012), and aligned its content with personnel standards developed by the National Association for the Education of Young Children (Chandler et al., 2012) to guide the practice of all early childhood professionals. In this way, multiple organizations have partnered to create a vehicle that aligns professional practice standards with the curricula of educational programs responsible for training early childhood professionals.

As these personnel standards guide the curriculum of early childhood teachers graduating from CAEP accredited institutions of higher education (IHE), there is a need to facilitate their adoption by state certification and licensing systems. This has not happened, nor has there been any movement across other disciplines that have broad age group standards to specify areas of competency specific to early childhood to guide IHE's preparing the early childhood workforce.

Confounding this lack of alignment between national accreditation systems guiding IHE's programs of study for a discipline and state personnel standards is the fact that not all IHE programs 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; Bruder & Dunst, 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 surveys of higher education programs of study (Bruder & Dunst, 2005; Chang, Early, and Winton 2005also suggest a lack of attention and congruence to national accreditation standards. 2005; Bruder & Dunst 2006; Bruder &Dunst, 2008; Dunst & Bruder 2006), such practices are not being carried out in current preparation programs. In order to assure that professionals have the skills and competencies needed to work with infants and young children with disabilities and their families, it is necessary for curricula at IHE to align guide state early childhood personnel standards and competencies.

PURPOSE

The Early Childhood Personnel Center at the University of Connecticut has objectives to meet as detailed in a cooperative agreement with the US Department of Education, Office of Special Education Programs. 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 IHE partnerships that have led to the alignment of State personnel standards and competencies and the curricula at IHEs; 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 early childhood personnel standards and competencies with curricula at institutions of higher education 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 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Liberati, Altman, Tetzalff et al., 2009; Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009), What Works Clearinghouse (What Works Clearinghouse, 2013), and the Cochrane and Campbell Collaborations (e.g., Higgins & Green, 2008). 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 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). Second, the study described IHE curricula. Third, the study described state agency standards or competencies. Fourth, the study was conducted in the United States of America (including territories). Finally, the study met What Works Clearinghouse Version 3.0 (What Works Clearinghouse, 2014) without reservation design standards (i.e., randomized controlled trial,

select single-case designs, and regression discontinuity designs). For this review, an article would have had to describe an experimental manipulation of state agency standards or competencies designed to align with IHE curricula.

SEARCH METHODS

We searched five electronic databases (Academic Search premier, Cumulative Index to Nursing and Allied Health Literature [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 October 2013 using a combined search of all databases simultaneously using the following strategy:

1. "higher education" OR college* OR university* 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. "educational standard*" OR "academic standard*" OR "state standard*" OR "curricul* standard*" OR "national standard*" OR "teaching standard*" OR "professional standard*" OR certification* OR licensing OR licensure* OR qualifications OR competencies
8. 6 and 7

We imported complete records into EndNote for deduplication and title/abstract screening. One coder initially screened all titles and abstracts to exclude clearly irrelevant articles. After screening, two coders independently reviewed the remaining titles for possible inclusion, with the remaining titles to have inclusion confirmed through full paper examination. All though we initially planned to do an archival search of the reference lists of included studies, we did not locate any studies, and thus omitted this step.

DATA CODING AND ANALYSIS PLAN

If studies meeting inclusion criteria were located, we planned to conduct both narrative and descriptive reviews of the included studies. If studies meeting inclusion criteria were located, two independent coders would have extracted data on multiple descriptive variables (e.g., population, location, type of study, experimental characteristics) and outcome measures (e.g., accomplishment of alignment of personnel standards and IHE curricula, changes in certification standards, 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, 208) for group research design studies incorporating concerns for inclusion of non randomized studies (e.g., Reeves, Higgins, Ramsay, Shea, Tugwell, & Wells, 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, 2013). 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 8,292 records through the database search; 6,550 records remained after deduplication and 449 articles remained after the initial screening of titles and abstracts. After the second title and abstract screening, 34 articles remained. After examination of the full papers of these 34 articles zero articles met all inclusion criteria. A PRISMA flow diagram (Moher et al., 2009) including reasons for exclusion of the 34 articles, for which we examined full papers is shown in Figure 1. Because no articles met inclusion criteria, we prepared a table describing the 34 studies that were given a full-text examination, which is shown in Appendix B.

DISCUSSION

This review sought to locate and synthesize the evidence of effectiveness of models aligning state-level early childhood personnel standards with IHE curricula. Unfortunately, we did not locate any studies meeting our inclusion criteria. This suggests that while coordination of early childhood state agency standards and IHE curricula have been advocated, to date, 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 effect 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 when systematically aligning state early childhood personnel competencies and standards with the curricula at IHE within their states. We acknowledge that such studies are likely to be lengthy and costly, however, in order for the field of personnel preparation to move forward. One method of addressing time and cost concerns might be to form regional partnerships of states within close proximity in which the experimental design uses a staggered implementation of the independent variable to provide a control group for comparative purposes.

Within our excluded articles (see Appendix B), we did locate articles describing IHE curricula in early childhood reporting varying degrees of alignment to recommended practices. Berzin and O'Conner (2010) found that for social work curricula, clinical preparation and the roles of the field were more heavily emphasized than coverage of new practices. Given the strong positive relations that have been shown between higher levels of teacher education in early childhood settings and improved performance of children on behavioral, cognitive, and social measures (e.g., Norris, 2010), establishing effective models of state collaborations with IHE in early childhood curricula must become a priority.

We also found examples of coordination of state agencies and IHE, particularly with respect to using and advancing distance education in rural settings where more severe personnel shortages have been noted (e.g., Cegelka & Alvarado, 2000; Chopra, Banerjee, DiPalma, Merrill, & Ferguson, 2013; Grisham-Brown & Collins, 2002; McLaren & Rutland, 2013; Ryan, 1999). Positive outcomes of distance education programs have included increased

number of personnel able to attend the programs (Cegelka & Alvarado, 2000; McLaren & Rutland, 2013; Ryan, 1999) and greater implementation of recommended practices (Grisham-Brown & Collins, 2002). Nevertheless, Chopra and colleagues noted the program adopted in Colorado was not cost effective and failed to educate an adequate number of professionals in the rural areas for which the program was designed. Collectively, although the articles describing distance education programs did not provide an experimental comparison of manipulating state standards, they do provide additional examples of how states can coordinate with IHE to create new programs or encourage expansion of programs in areas of need. Moreover, the technologies employed in distance education may also prove to be useful in reaching larger numbers of pre-service students at a time, which could be used to alleviate an upcoming shortage of early childhood IHE professors and course instructors. Researchers might also consider using technology to address cost concerns of large scale comparisons.

While we did not locate alignment of early childhood standards with IHE curricula, we are aware of efforts in principal preparation programs (e.g., Hackmann & Wanat, 2007; Hunt, 2010). In Iowa (Hackman & Wanat, 2007) and Illinois (Hunt, 2010), the State's Departments of Educations both initiated processes to reform licensure standards using a model developed by the Interstate School Leaders Licensure Consortium. In this new system, each state developed new curricular criteria at the state level and IHE from that state were then required to reapply to become an approved program. While there are significant differences in personnel preparation for early childhood service providers and school administrators (principals), there is no reason the processes of aligning state standards with IHE curricula cannot be achieved in early

childhood as it was for principal licensure. We therefore suggest the processes undertaken by Iowa and Illinois be used as a model for early childhood personnel, with an added component of rigorous evaluation of the effects of such policy changes.

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 standards with IHE. Additionally, we cannot rule out that we missed studies that would have met inclusion criteria. Because we did not locate any studies meeting our inclusion criteria, we were not able to analyze methods of aligning state standards and competencies with IHE curricula; thus, we are unable to provide an evaluation of best practice in this area. To amend for this we did provide an appraisal of studies that provide descriptions, but not experimental evidence of such practices as a guide for future work in this area.

CONCLUSION

A workforce of appropriately trained personnel who meet the professional standards of their profession must be available to support the growth of quality early childhood services. Unfortunately, states are struggling to build this capacity, with one barrier being a lack of congruence between state workforce credentialing systems and validated early childhood personnel standards designed to assure competence (e.g., Li & Firorello, 2011; Stayton, Smith,

Dietrich, & Bruder, 2012). This review demonstrated that there is little to no research that has been conducted on this congruence. Future research must be supported in this area of quality assurance.

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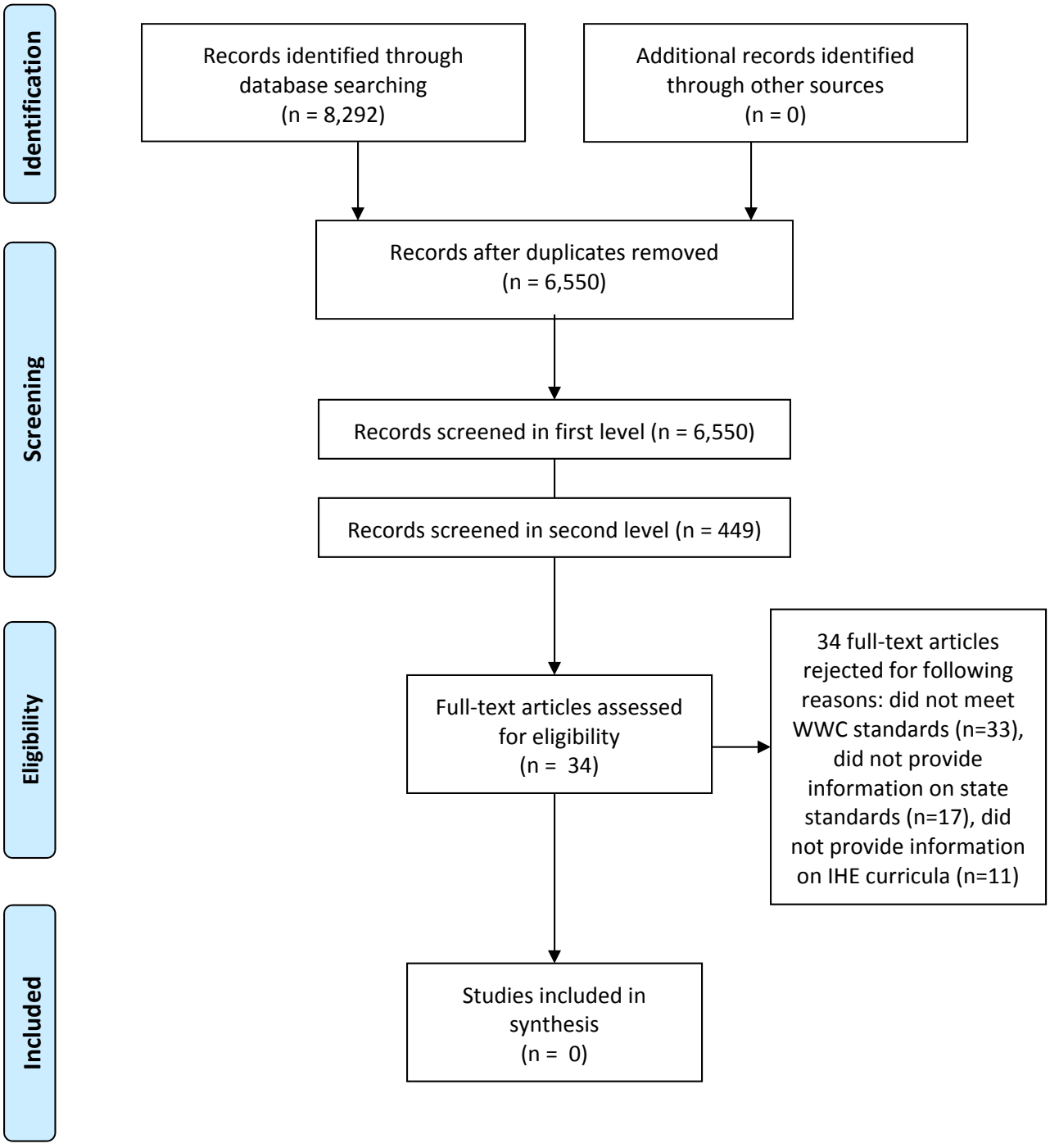
Figure 1. Study inclusion decision tree (using PRISMA flow diagram, Moher et al., 2009)



Appendix A. PRISMA Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
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.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4-6
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	5-6
METHODS			
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.	6-7
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.	8-9
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).	8-9
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).	8
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	8-9
RESULTS			
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, Fig. 1
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

DISCUSSION			
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
FUNDING			
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**.

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	Adams and Wolf (2008) described the development and implementation of Performance-based assessments (PBAs) in the early childhood special education program at the University of Colorado Denver. PBAs consisted primarily of observation and rating of students in the early childhood special education by practicum site supervisors and reviews of student portfolios containing lesson plans, logs of contact hours, assessment instruments, and other evidence of meeting state and national standards. In total, nine PBAs were implemented to assess student proficiency: assessment, challenging behavior, curriculum, intervention, literacy, mathematics, primary literacy, primary mathematics, and professional practice. Each PBA was rated on a four-point scale on which students were required to achieve a rating of proficient or advanced. The implementation of PBAs in the early childhood special education program ultimately proved to be an effective means of obtaining more detailed information about the skills and abilities of students in the program.
Berzin & O'Connor (2010)	Educating today's school social workers: Are school social work courses responding to the changing context?	Berzin and O'Connor analyzed contents of syllabi of school social work courses in master's degree programs to determine how well trends in education such as evidence-based practice, response-to-intervention, positive behavioral support and No Child Left Behind 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 in the field of education 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.
Breffni (2011)	Impact of curriculum training on state-funded prekindergarten teachers' knowledge,	With teacher qualification requirements for state-funded prekindergarten programs varying from state to state, professional development programs can have a substantial impact on program quality and outcomes (Breffni, 2011). Breffni (2011) implemented an 8-week course entitled "Best Practices in Prekindergarten Curriculum" for teachers in Florida's voluntary prekindergarten (VPK) program. The course covered child

	beliefs, and practices	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.
Bryan, DeBord, & Schrader (2006)	Building a professional development system: A case study of North Carolina's parenting education experiences	Bryan Jr., DeBord, and Schrader outline the efforts of parent educators to network and coordinate the efforts of a number of statewide parent education initiatives and ultimately form the North Carolina Parenting Education Network (NCPEN). Through the network, common terminology, competency-based frameworks, and a professional credentialing system were established. While NCPEN has succeeded in providing parent educators with a recognized credentialing system and other resources, implementation of evidence-based practices into parent education curricula remains a goal in North Carolina.
Carr & Evans (2006)	Helping beginning teachers remain in the profession: A successful induction program	This article provided a brief overview of the Teacher Scholars Program (TSP) at Southeastern Louisiana University. As part of the program, enrollees completed a specialized master's degree program in either Special Education/Mild-Moderate Disabilities or Curriculum and Instruction in Elementary Education or Reading while receiving "systematic and sustained support to ensure that beginning teachers remain in the teaching profession" (Carr & Evans, 2006, p. 114). Beginning teachers who have completed the program rated the support they received as having been helpful. Those who completed the program were often actively recruited by principals, continued to teach in southeastern Louisiana, and were active in leadership positions.
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 interns in the program, was locally available during the school year and offered summer sessions at a larger urban campus, utilized external grant funding to offset costs for interns in the

		program, and 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.
Chopra, Banerjee, DiPalma, Merrill, & Ferguson (2013)	Colorado's model for preparing paraprofessionals for rural early intervention programs	The increased need for early intervention services that has come about as a result of improved identification and screening methods for children with disabilities along with a shortage of licensed professionals and the difficulties associated with providing services in rural areas have increased the demand for qualified paraprofessionals in Colorado. 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 (DI) assistant paraprofessionals, and another in which certain individuals completing the supervision course received further training in which they learned strategies necessary for training paraprofessionals. While 39 participants had completed all requirements for a DI assistant certificate by the end of 2012, the training programs strained the resources of community centered boards, was not cost effective, and failed to educate many paraprofessionals in the rural areas they were most needed. Authors proposed utilizing community college networks to remedy these issues.
Couse & Chorzempa (2005)	Service learning: Field experience for advanced early childhood degree candidates	Authors 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 either 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 of service learning was used, consisting of planning, implementation, and reflection. 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 model for other advanced

		teaching courses.
Dennis, Edelman, & Cloninger (2001)	The Vermont state I-Team then and now: Twenty-five years of technical assistance and training	The authors provide a retrospective of Vermont's I-Team, which has focused on technical assistance, training, and support for the families of children with disabilities since 1977. At its inception, the I-Team took an interdisciplinary approach to education of students with disabilities, utilizing a Regional Educational Consultants as a link between local teams in rural areas and the statewide components of the program. As the program expanded, it covered individuals with less severe disabilities and training activities reached greater numbers of people across the state of Vermont. More recently, services in the state have become less regionalized, emphasis on local educational teams has grown, and strategies for handling increased caseloads have been discussed. The I-Team has helped to achieve high rates of inclusion in general education classrooms for students with disabilities, but a continued focus on technical assistance and training is necessary to ensure that professionals in general education environments have the proper skills and knowledge to teach students with disabilities.
Dennison (2000)	The VIISA project: A model national in-service training program for infants and young children with visual impairments	In an attempt to address the shortage of special education teachers qualified to work with children with visual impairments, Utah State University pioneered the VIISA project, an in-service training program for early childhood personnel. State agencies worked closely with a national VIISA instructor to establish a state training team and provide the team with the necessary resources. The national instructor and state training team then worked collaboratively to teach courses focused on infant/toddler or preschool children with visual impairments. Courses consist of an initial two and a half day training at a central location, seven at-home study units, and a final two and a half day training at a central location. After completion of the course, the national instructor provides ongoing technical assistance. Participant ratings of course quality have been extremely high, indicating that the VIISA project constitutes an effective means of providing specialized training to teachers of children with visual impairments.
Grisham-Brown & Collins (2000)	Training rural educators in Kentucky through distance learning: Impact with follow-	Grisham-Brown and Collins (2002) sent a survey to teachers in rural Kentucky who had completed graduate-level courses as a part of the Training Rural Educators in Kentucky through Distance Learning (TREK-DL) project. The courses were taught as a part of graduate programs in either moderate and severe disabilities or early childhood special education and included content related to ABA, instructional methods for students with

	up data	disabilities, and nonverbal communication. Students reported high levels of satisfaction with course content, with no course receiving lower than a 4.4 on a five-point Likert scale. Problems associated with the satellite, video communication or conference call technology negatively impacted students' ratings of delivery of course content. Students also reported difficulty communicating with instructors to have questions about course content answered in a timely manner. Despite these issues, the courses improved the rate of implementation of best practices for children with disabilities, lending support to distance learning as a means of personnel preparation in rural areas.
Hite & Boulos (2011)	Lowering barriers to progress at the state level	Hite and Boulos describe the efforts of school psychologists in Maine to lobby for and ultimately achieve passage of a bill in the state legislature designed to clarify terminology, expand services from K-12 to birth-12, expand practice to provide additional services including counseling, and add requirements for professional supervision of recent graduates. The article details the efforts of the Maine Association of School Psychology to establish a common set of goals in changing practice in the state, educate legislators about the field of school psychology, have a bill introduced, and advocate for its passage. With the passage of the bill and its being signed into law, the authors report the potential for improved outcomes for children and families.
Landry, Swank, Smith, Assel, & Gunnewig (2006)	Enhancing early literacy skills for preschool children: Bringing a professional development model to scale	The authors describe 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.
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.
Li & Fiorello (2011)	Evolving practicum issues in school psychology preparation	Vague language in the guidelines of the APA and National Association for School Psychology has led to a great deal of confusion and variability regarding the role of practicum experiences in the training of school psychologists. While general requirements are provided, questions of criteria for qualification as a practicum site, minimum number of hours required, rules regarding qualifications of supervisors and their roles, and assessment criteria are left largely up to the institution housing the doctoral program. Li and Fiorello (2011) discuss many such issues as what activities should count towards practicum hours, the nature of the relationship between supervisors and students, and ways to improve communication between practicum sites and doctoral programs. The authors ultimately provide recommendations for the regulation of practicum experiences at the national, state and local, and program levels.
Little & Houston (2003)	Research into practice through	Little and Houston (2003) describe the implementation of a Florida program developed to bridge the gap between research and practice in early childhood education. Graduate

	professional development	students first conducted literature reviews to identify evidence-based practices, methods, strategies, or products that could be implemented in classrooms throughout the state. Experts were then consulted and professional development programs were developed for early childhood educators to be trained in such areas as algebraic thinking, reading, written expression, or phonological awareness. Application for professional development programs was competitive, and selected participants were primarily kindergarten, early elementary, or special education teachers. The program emphasized that professional development was a process, rather than a two to five day single event. Regional mentors and follow-up peer coaching were used to achieve high rates of implementation. Teachers then conducted assessments with their students to determine the effects of the new practices, and moderate effect sizes were found for fall-to-spring growth in phoneme awareness. Teacher satisfaction with the program was extremely high (90%). The success of this program emphasizes the need for a comprehensive approach to professional development programs with evidence-based content.
Lobman. & Ryan (2007)	Differing discourses on early childhood teacher development	New standards for personnel in early childhood education have been rolled out by researchers and national policy advisers with little in the way of input from early childhood teachers or teacher educators themselves. The authors of this article attempted to gain insight on perspectives of these individuals by facilitating focus groups in which teachers and teacher educators could voice opinions about evolving personnel standards. Participants in the focus groups were preschool teachers, teacher educators at two and four-year institutions, and professional development providers. The majority of participants indicated that knowledge of child development was the most important area in which to have expertise, partially because preschool teachers must often resist pressure to emphasize academic development, instead focusing on the more developmentally appropriate practice of stressing maturation and social development in the preschool years. Teachers and teacher educators generally indicated that they placed less emphasis on the areas stressed heavily by state standards such as diversity training, domain-specific knowledge (e.g. literacy or math instructional techniques), and the need to professionalize the field of early childhood education. As a result, the authors recommend establishing a more direct link between individuals developing educational policies and those implementing them.

Ludlow, Conner, & Schecter (2005)	Low incidence disabilities and personnel preparation for rural areas: Current status and future trends	The authors described the severe, chronic shortage of qualified special education teachers for low incidence disabilities (visual impairments, hearing impairments, severe disabilities, and early intervention) in rural schools in the United States. State certifications and university-based programs were examined. Not all states offered certification in low incidence disabilities, and certification was more often available for sensory disabilities (visual and hearing impairments) than severe disabilities or early intervention. Personnel preparation programs for low incidence disabilities were based primarily in large universities, and were frequently offered via distance education delivery systems that use TV, satellite or the internet to reach the rural areas where the personnel shortage is most acute. While such programs offer promise as potential solutions, only one university (University of Nebraska-Lincoln) offered programs in all four low incidence disabilities. Technology for distance learning can still be prohibitively expensive, and shortages may persist even with increased enrollment in existing programs. More research is necessary to determine the best way to address this shortage.
Magyary & Brandt (2005)	A leadership training model to enhance private and public service partnerships for children with special healthcare needs	A nursing training grant model of leadership was implemented with a cultural competency conceptual framework to help train nursing leaders to create closer ties between public and private sectors at all levels of healthcare. Using culturally sensitive, family-centered strategies in the delivery of services to families who have children with special healthcare needs has the potential to improve outcomes for individuals from a wide variety of cultural and socioeconomic backgrounds.
McCollum & Yates (1994)	Technical assistance for meeting early intervention personnel standards: Statewide processes	This article describes the Partnerships project in the state of Illinois. Partnerships is a 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 is 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 is to provide specialized training that is 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.
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 (TEAC) 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. TEAC 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	Wichita State University's early childhood unified (ECU) residency program 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 (2013)	Preparing early childhood special educators in Appalachian Kentucky	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. 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 are 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.
Norris (2010)	Raising the educational requirements for teachers in infant toddler classrooms: Implications for institutions of higher education	A strong positive relationship exists between higher levels of teacher education in early childhood settings and improved performance of children on behavioral, cognitive, and social measures, as well as improved teacher-child interactions. This relationship has led to calls for higher standards in educational requirements for early childhood personnel, which pose some problems for institutions of higher education offering programs in early childhood education. Shortages of teachers qualified to train early childhood educators, the high proportion of nontraditional students already in the workplace, and prohibitive costs associated with working towards a degree in early childhood education. The author recommends potential solutions to these problems, including developing effective online courses, expanding scholarship support to help defray costs for students, and increase recruiting of faculty qualified to teach in this area.
Pizur-Barnekow, Rhyner, & Lund (2010)	The pipeline training program in maternal and child health: Interdisciplinary preparation of undergraduate students from	This article describes the Preparing Academically Successful Students in Maternal and Child Health (MCH PASS) program at the University of Wisconsin-Milwaukee. The PASS program is designed to provide support to occupational therapy and speech language pathology undergraduate students from underrepresented groups (e.g. African-Americans, first-generation college students, financially disadvantaged students). Support was provided in three areas: financial, mentorship, and networking. Application was competitive, and 16 trainees were ultimately accepted. Trainees participated in weekly

	underrepresented groups	interdisciplinary seminar courses throughout summer, fall, and spring semesters. All trainees successfully completed the program, and 15 of the 16 applied to graduate programs in their respective fields. Program satisfaction among trainees was high. The MCH PASS program appears to have been effective in its attempts to increase the numbers of underrepresented groups in maternal and child health, and specifically in occupational therapy and speech and language pathology.
Reinke, Herman, Stormont, Brooks, & Darney (2010)	Training the next generation of school professionals to be prevention scientists: The Missouri Prevention Center model	The Missouri Prevention Center (MPC) was developed to improve the rate at which evidence-based practices are implemented to address emotional disturbances in schools. To attempt to address this disconnect, The MPC is an initiative designed to train school psychology faculty leaders who are well-versed in evidence-based practices, capable of teaching those practices to others, and able to conduct research to develop new practices. The coursework of the MPC program for school psychologist students is described, including training on specific evidence-based practices such as the Incredible Years program and PBIS models. The MPC appears to be an effective model for training school psychology professionals who are well-versed in evidence-based practices and who will conduct research with the ultimate goal of improving outcome for children with emotional disturbances.
Ryan (1999)	Alaska's rural early intervention preservice training program	The shortage of qualified early intervention professionals in rural areas is particularly problematic in Alaska. University of Alaska-Anchorage developed a master's-level early intervention personnel preparation program to address this shortage. Efforts were made to recruit undergraduates in teacher education, current educators and practitioners of early childhood intervention, and recruit native Alaskans. Issues associated with the rural setting of the program were addressed by using an in-person/distance learning hybrid and allowing internships and practica to be located at the participant's current job. This program achieved its goal of graduating 30 individuals in its first three years, and evaluations of course satisfaction were very positive. As a result, the program has received further funding from the state of Alaska and the US Department of Education. This program constitutes an important step forward in addressing the shortage of early intervention professionals in Alaska.
Schweinhart (2009)	Designing a curriculum for EC	Research on long-term outcomes for children completing early childhood programs has been mixed. Many states have little in the way of education and certification requirements

	teachers and caregivers	for teachers in child care settings, and professional development is often not a priority in this group. This author advocates the acceptance of the HighScope curriculum, which was designed to meet the needs of public school teachers as well as individuals in private child care settings and to be accessible to parents and family caregivers.
Sheridan, Edwards, Marvin, & Knoche, (2009)	Professional development in early childhood programs: Process issues and research needs	Sheridan and colleagues provide an overview of research on professional development practices for early childhood programs. After providing a definition of professional development, the different types of professional development are outlined, including specialized training, coaching/consultation, and communities of practice. Current research on different forms of professional development is then described, with the authors noting that specialized training and multidimensional training have demonstrated positive effect on teacher knowledge and competencies. Investigations of process variables related to professional development, effective coaching and mentorship, personal characteristics (intrapersonal) and relationship dynamics (interpersonal) are identified as areas in need of further research.
Smith, , Robb, West, & Tyler (2010)	The changing education landscape: How special education leadership preparation can make a difference for teachers and their students with disabilities	Similar to much of the other literature focused on special education personnel preparation, the authors of this article note a chronic shortage of special education teachers and relatively few special education teacher training programs. Specifically, shortages in faculty are hypothesized to play a substantial role in the field of special education teacher training. Small numbers of qualified faculty in teacher education programs will lead to reduced numbers of special education teachers. As some proportion of special education teachers go on to return to graduate school and eventually become faculty, the shortage is proposed to be cyclical in nature, perpetuating itself and over time resulting in smaller programs and fewer faculty members with the proper expertise to train new special educators. Federal policies and funding also affect the supply of faculty. The necessity of further dialogue to address the shortage of faculty and, by extension, special education teachers, is emphasized.
Utley (2009)	An analysis of the outcomes of a unified teacher preparation program	The University of Colorado, Denver's program in unified teacher preparation is a collaborative effort between general and special education programs and requires a final internship at an approved Professional Development School (PDS). The outcomes for students taught by teacher candidates in these schools were examined through use of student academic performance samples, a performance-based assessment that required

		candidates to choose preassessment and postassessment measures of student learning for their classrooms. The inclusive3 nature of the unified teacher preparation plan allowed for comparison of students with and without disabilities. Children with disabilities were found to demonstrate learning on par with children without disabilities in 14 of 20 randomly selected academic performance samples. The inclusive nature of this teacher preparation program is somewhat unique in personnel preparation, but its promising results indicate that further investigation of such models is warranted.
Vu, Hyun-Joo, & Howes, (2008)	Formal education, credential, or both: Early childhood program classroom practices	Teachers in California are required to hold a called a California Child Development Permit (CCDP) in order to teach in that state. The CCDP is a multi-level certification and one can hold it with or without a BA. The current study attempted to determine the effects of postsecondary education on classroom quality throughout the state, as well as the differences in classroom quality based on level of CCDP certification. The program director, lead teacher, and assistant teacher (where present) were classified according to level of certification, and classroom observations were conducted. Results indicated that classroom quality in private, nonprofit, Head Start, and general child care settings was higher for individuals with BA degrees. These differences, however, did not hold for school-district-sponsored child care agencies, where effects of postsecondary degree fell short of significance, possibly because credentialing requirements are more stringent in this environment. Education level of program directors also significantly affected classroom quality. The authors recommend that further research be done in this area.
Williams, Landry, Anthony, Swank, & Crawford (2012)	An empirically-based statewide system for identifying quality pre-kindergarten programs	Williams and colleagues followed 8,000 children in 1,255 prekindergarten classrooms in Texas for a period of one year and tracked prekindergarten quality indicators to determine their effects on school readiness. High quality prekindergarten classrooms have been identified as a means to ensure school readiness for children from low-SES backgrounds. A valid classroom quality rating system can help inform parents and allow them to choose the best program for their child, increase accountability in government, and help educators implement more effective practices in their programs. The School Readiness Certification System (SRCS), a web-based application, was thus developed to supplement existing classroom quality rating systems. The SRCS includes both a self-report and an observational component, the latter based on the Teacher Behavior Rating Scale (TBRS). Analyses conducted using SRCS scores indicated that teacher professional development,

		teacher instructional approaches, and literacy oriented instructional activities were the three areas that most strongly predicted which classrooms would have higher numbers of school-ready children. Despite some limitations, the SRCS appears to be an effective means of informing parents, policymakers, and educators about best practices in prekindergarten classrooms.
Zlotnik (2002)	Preparing social workers for child welfare practice: Lessons from an historical review of the literature	Collaboration between social work and child welfare agencies has historically been quite strong, and a number of laws passed have provided federal funding to encourage child welfare workers to pursue MSW degrees, enhance curricula in MSW programs, and provide support to social work students. The 1970s and 80s saw a trend in which child welfare work was declassification where fewer states required child welfare staff to hold MSW degrees, leading to a weaker link between the two areas. Though a lack funding in recent years has been a problem, social work and child welfare have renewed their relationship and worked to encourage more new social workers to go into public service. Moving forward, the author emphasizes the necessity that these two closely related fields continue to work together to achieve optimal service delivery.