JAN ESTERAICH | FOR THE BUFFETT EARLY CHILDHOOD INSTITUTE

Technology-Supported Early Childhood Professional Development in Nebraska

Buffett
Early Childhood
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at the University of Nebraska

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Executive Summary

This report investigates the current uses of technology in early childhood professional development (ECPD) in the U.S., Nebraska's current ECPD requirements and delivery systems, how Nebraska programs are integrating technology into their professional development, and how technology can be leveraged to provide more access and more effective professional development for the workforce serving children from birth to age 5 in the state.

There is broad consensus that ongoing professional development of early childhood care providers and educators is key to raising child care quality. Many states, including Nebraska, require home- or center-based licensing, annual training, and requirements of teacher credentialing and certification. Forty-two states (including Nebraska) have also adopted a Quality Rating and Improvement System (QRIS), a framework for quality improvements in order to raise child care quality. As a result, many states face a growing need to provide training and formal education to large numbers of early care and education practitioners dispersed across wide geographic regions.

Budgetary resources for early childhood professional development and training, however, have not kept pace with the need. These budget constraints especially affect practitioners in geographically isolated regions who are more difficult to reach because of the travel costs involved in face-to-face training. The increasing need for providers to access training and college courses has motivated states to begin offering tech-supported ECPD to maximize the flexibility and accessibility of PD offerings, as well as improve program practices, while maintaining quality and managing costs.

IN THIS REPORT, THE FOLLOWING TOPICS ARE EXPLORED:

1. Current types of technology-supported early childhood professional development programs being used in the U.S.
2. Technology-supported ECPD that predicts quality outcomes for teachers and children
3. Nebraska's population distribution as it relates to ECPD
4. Nebraska's early childhood professional development structure and requirements (Birth – PreK), and how technology is supporting the delivery of PD
5. Nebraska's broadband infrastructure for education and home access

FINDINGS

1. Early childhood professional development programs in the U.S. use a variety of technologies to deliver training.

- Online modules, video, virtual meetings, and webinars are the most common delivery methods.
- Tech-supported early childhood professional development offers early childhood providers flexibility in time and place. However, some teachers prefer in-person training.
- Internet bandwidth and home access are still barriers to using the internet for ECPD, although school districts and public libraries are options for those who need to connect.
- Several states are now offering ECPD, delivered through a dedicated, comprehensive ECPD website, tailored to the states' needs.

2. Video has the strongest evidence base for positively affecting teachers' practices and child outcomes.

- Viewing videos of high-quality teaching to use as a model, discussing self-recorded video with a coach or peer, and using self-recorded video for self-reflection have been shown to change teachers' interactions and enhance children's outcomes.
- Conducting coaching meetings via virtual conferencing has also been shown to be effective in ECPD.
- Online modules that include video exemplars or assignments to reflect on self-recorded video have also had positive outcomes for teachers.

3. Overall, technology use for early childhood professional development in Nebraska is scattered and non-systematic in its application.

- The use of tech-supported ECPD in Nebraska is used primarily for administrative tasks (virtual conferencing and Google Docs).
- There is successful use of online courses created by state offices (Answers4Families, First Connections).
- Some programs use virtual conferencing, and innovative instructors are piloting projects involving video and social media.

4. Nebraska's broadband infrastructure for educational entities is very strong with a high-speed backbone running across the state.

- All public school districts, educational service units (ESUs), and state and community colleges have access to Nebraska's broadband infrastructure.
- These educational entities are organized within a consortium that leverages its

size to buy the lowest-priced commodity internet in the country. They receive very low pricing on enterprise software purchases.
- For home broadband coverage, the state has almost complete access, but pricing to buy access is still out of reach for some households.
- Some rural residents are not satisfied with the speed of access.
- A study commissioned by the state to investigate statewide broadband access is underway.

5. **Most child care in Nebraska is private (home-based or center-based) and not affiliated with public sector programs that have more ready access to professional development.**
   - Of Nebraska's 1.89 million residents, 55% live in the metropolitan areas of Omaha and Lincoln, and 45% live throughout the rest of the state.
   - Nebraska has 3,007 (2016) licensed early childhood care providers, roughly split between the metro areas and the rest of the state: 48% and 52%, respectively.
   - The state has 245 public school districts, including 188 districts that have established various types of PreKindergarten services for children ages 0 – 5.
   - In total, the state currently has a child care capacity of 113,770 children.
   - Licensed child care providers not associated with a school district or state/federal program are able to serve 83,871 children, or 74% of the state's child care capacity. These providers are not as connected to PD opportunities and do not have as much funding to support PD for themselves or staff members.

SHORT-TERM RECOMMENDATIONS

1. **Increase tech-literacy training for all early childhood professionals, including program administrators, professional development instructors, and early childhood care providers.** Training needs to range from very basic use of technology to mid-level training on tools such as Zoom, Google Docs, social media, YouTube, cloud storage, video editing/uploading/downloading, learning management systems, and distance education technology. Advanced courses would go deeper into all of these tools.

2. **Provide access to technology support.** Partnerships between school districts and local professional development coordinators (Early Learning Connection Coordinators and University of Nebraska Extension educators) for tech assistance may be one solution. In addition, ESUs have highly skilled technical teams that assist schools and could be a resource for training.

3. **Increase use of distance learning and virtual conferencing.** These very effective training methods have not been fully utilized because many PD trainers don't

know how to use the technology. ESU technical teams are well-versed in using the equipment and may be willing to assist ECPD instructors and trainers.

4. **Develop partnerships with the state's educational service units.** Working with ESUs for tech-related ECPD seems a natural fit, but legislative parameters regarding the ESU's K-12 mission and funding considerations would need to be addressed.

5. **Use video in coaching models and coach training.** Much interest in using video in coaching was expressed by program administrators and coaches during interviews for this report. Some of the concerns regarding video use were technical in nature and could be addressed with training in video editing, uploading, and downloading.

6. **Encourage the use of the Nebraska Early Learning Guidelines online modules in a blended format.** The Nebraska Early Learning Guidelines for 3- to 5-year-olds are based on research and evidence about child development and practices that result in the best outcomes for young children. The statewide Early Learning Connection (ELC) Coordinators currently teach this essential course in a series of face-to-face training sessions. In a blended format, participants would complete the coursework online prior to the live training sessions, providing a baseline of knowledge that would enable the ELC trainers to present more instructive, interactive, participant-led exercises.

7. **Pursue pilot projects.** Because of the immediate need to train providers and teachers, small-scale innovative tech-supported PD programs can be tested in the field. Creating supports such as a web space where PD instructors could document their tech-supported PD projects and findings, answer questions, and post relevant information would boost the state's collective knowledge of ECPD. Grants supporting these pilot studies could also help add more formalized methods of research with the help of university researchers.

8. **Establish a comprehensive early childhood professional development website.** An easy-to-navigate, attractive, comprehensive website where early childhood providers, teachers, PD trainers, program administrators, and coaches can access PD information would be a strong addition to Nebraska's current ECPD system. Most of this information is available online but is scattered across various websites.

9. **Leverage Network Nebraska's broadband access and the state's efforts for home access.** Network Nebraska's capacity is available for use by all educational entities, defined as Kindergarten through higher ed (K-16). Expanding that definition to birth through higher ed could open additional possibilities for greater high-speed broadband access.

LONG-TERM RECOMMENDATION

Conduct a feasibility study of a technology-based early childhood professional development system. Current efforts to improve the quality of Nebraska's child care and grow the workforce could be bolstered by systematically integrating technology into the administration, management, and delivery of the state's ECPD. A technology-based ECPD system would recognize and consolidate the needs of various stakeholders and extend efficiencies in all aspects of professional development, management, and access. If this approach is desirable, it is recommended that a feasibility study of the creation and implementation of a technology-based ECPD system be considered. A feasibility study from a systems perspective would address the scalability, effectiveness, accessibility, and sustainability of the proposed ECPD system.

CONCLUSION

Nebraska faces growing need to provide training and formal education to large numbers of early care and education practitioners throughout the state. This need is prompted by efforts to maintain or improve quality practices and increase capacity in the state's public and private child care services. However, budgetary resources for ECPD and training have not grown as quickly as the need, or have remained static, requiring the state to stretch limited resources across a growing number of family child care providers, child care centers, and preschool entities.

It is noteworthy that nearly 74% of available child care in Nebraska is licensed care that is not affiliated with a school district, ESU, or federal early childhood program. These professionals inevitably have the least explicit, least systematic infrastructure for PD and could benefit greatly from such tech-supported PD as online courses. The potential of tech-supported ECPD to offer high-quality training opportunities that can flexibly meet professional development needs of providers statewide is propelling it forward as an effective and feasible ECPD option.

Introduction

The quality of non-parental child care has important short- and long-term consequences for children's development and well-being (e.g., Burchinal, Howes, Pianta, 2008; Duncan, 2003; Vandell, Belsky, Burchinal, Steinberg, & Vandergrift, 2010). Furthermore, there is broad consensus that ongoing professional development of early childhood care providers and educators is a key component in improving practices in the child care environments to reach the quality needed to help children succeed (Burchinal, Cryer, Clifford, & Howes, 2002; Bogard & Takanishi, 2005; Zaslow & Martinez-Beck, 2005).

To ensure quality in child care environments, many states, including Nebraska, require home- or center-based licensing, annual training, and requirements of teacher credentialing and certification. Also, 42 states (including Nebraska) have adopted the Quality Rating and Improvement System (QRIS), a systemic approach to improving the level of quality in early care and education programs. Thus, many states are facing the growing need to provide training and formal education to large numbers of early care and education practitioners dispersed across wide geographic regions.

However, budgetary resources for ECPD and training have not grown at the same rate as the need, requiring states to stretch limited resources across a growing number of child care providers and educators. This constraint especially affects practitioners in geographically isolated regions who are more difficult to reach because of the travel costs involved in face-to-face training.

This increasing need for providers to access training and college courses has motivated states to consider offering tech-supported ECPD (Clark & Mayer, 2011). As a result, many states have started to utilize technology-supported early childhood professional development to maximize the flexibility and accessibility of PD offerings, as well as improve program practices, while maintaining quality and managing costs.

There has been some skepticism about the effectiveness and desirability of online and tech-supported PD for early childhood professionals because of the high-touch, high-relationship nature of early childhood work. However, research has shown that particular configurations and models of online and tech-supported ECPD are just as effective, and in some cases more effective, as in-person training for improving teachers' practices and children's outcomes.

This report presents an overview of tech-supported ECPD used in the U.S., an overview of Nebraska's current ECPD requirements and delivery systems, how the state currently uses technology to deliver ECPD, and an initial analysis of how the state could leverage technology to reach more child care providers and improve practice quality.

The focus is primarily on services provided to early childhood practitioners who are not associated with a school district or an Educational Service Unit and are seeking licensing and training. This is an important distinction in Nebraska, given that nearly 74% of the available child care in the state is licensed care that is not affiliated with a school district, ESU, or federal program, which have resources for delivering ECPD. These professionals inevitably have the least explicit, least systematic infrastructure for PD and could benefit greatly from tech-supported PD such as online courses. However, much of the information in this report, as well as the recommendations, is applicable to all providers of early childhood care, whether in programs associated with school districts, private providers and schools, or federally funded programs.

Methodology

Several methods were used to gather information and research for this report. Extensive internet searches and in-depth expert interviews (with follow-up interviews) were the methods of data collection. The research strategies are described in more detail below.

INTERNET SEARCHES

Current Uses of Technology in Early Childhood Professional Development (ECPD)

A broad sampling of technology-supported ECPD products, programs, and online offerings was generated by entering the following search terms in various combinations: Early childhood, early child development, young children, Head Start, Early Head Start, online professional development, professional development, web-mediated, technology-enhanced, online training, distance learning, online facilitated, video training, webinar, social media, technology-mediated, online learning, early childhood educators, early childhood care providers, child care providers, home visitors, child care, professional learning communities, learning communities, and learning circles. The list of products and programs was curated based on expert evaluations and available evidence.

Empirical Evidence on Tech-Supported ECPD

An academic literature search was conducted to obtain available empirical evidence of associations among types of tech-supported ECPD and trainer, practitioner, and child outcomes. Because the report's goal was to identify effective uses of technology to support early childhood teacher practices and child outcomes, evaluative studies that used a randomized control trial design, quasi-experimental designs, single group pre- and post-test designs, and qualitative case studies that focused on positive and promotive provider and/or child outcomes were included. The literature search was conducted across several academic databases and the results included peer-reviewed journal articles, book chapters, and government reports. Search terms for the academic literature search were similar to the terms listed above.

Other States' ECPD Systems – How Technology Is Used

Through various internet searches, several states using technology to deliver state-required ECPD were identified. A deeper exploration of the states' ECPD websites and online offerings was conducted and a list of exemplary websites was included in the report. The criteria for inclusion were: a comprehensive offering of tech-supported or online ECPD, the website's ease of use, website organization, and navigation.

ECPD in Nebraska and How Technology Is Being Used in Nebraska to Support ECPD

Information regarding Nebraska requirements for licensing and compliance to state laws for early childhood entities and professionals was obtained from various state

department websites (e.g., the Nebraska Department of Education's Office of Early Childhood, the Nebraska DHHS, etc.), Nebraska early childhood organizations (e.g., First Five Nebraska, Voices for Children), and state and regional programs (e.g., Sixpence). Interviews were conducted to survey what types of technology-supported ECPD were currently being used in the state.

Early Childhood Programs in Nebraska and Nebraska Demographics

Data regarding early childhood provider licensing and early childhood programs established by districts were obtained from the Nebraska Department of Education, Nebraska Children and Families Foundation, and Voices for Children, and data about Nebraska population distribution were obtained from the U.S. Census Bureau.

EXPERT INTERVIEWS

In-depth interviews were conducted with several Nebraska early childhood professionals including state- and regional-level early childhood administrators, directors of statewide programs, statewide professional development coordinators, extension educators, professional development trainers, and faculty members at the university. Persons involved in statewide broadband telecommunication systems were also interviewed. One of the objectives of the expert interviews was to obtain information about how technologies support the delivery of ECPD and what products they use. Another objective was to gain insights about the experiences of using the technologies, and the perceived advantages and obstacles of using tech supports to deliver ECPD.

The interviews were both in person and over the phone. All interviews were audio-recorded with the permission of the interviewee. The audio recordings were transcribed and analyzed for themes pertinent to the research questions. Please see the Acknowledgments section at the end of the report for a list of the interviewees.

Interview Questions

Questions asked during the interview were tailored somewhat, depending on the interviewee's work in the early childhood profession. However, general questions included:

1. How does your organization currently use technology to support PD efforts (licensing, STEP, Rule 11, annual training hours, general training)?
2. How does the use of technology help you to deliver ECPD? (advantages)
3. What are the obstacles you, your trainers, or the providers you work with encounter when using technology to support PD efforts?
4. What are some of the needs you have in regard to using technology to deliver ECPD?
5. What are some of the ways you have used technology with your providers that were innovative?
6. How do you envision using technology (or how would you like to use technology) in the future to deliver or receive PD training for yourself or the providers you work with?

Often these questions would lead to more specific discussions about how their organization used and experienced technology in ECPD, and further follow-up questions were asked to gather more complete information about their experiences. For the interviews about high-speed, broadband internet delivery to educational entities in Nebraska, questions focused on the structure of the Network Nebraska backbone, fee structure and services offered to consortium members, capacities of the network, E-rates, the legislative bill(s) that created and guide distance education in Nebraska, and some discussion about home access to high-speed internet.

Findings

TOPIC 1: IDENTIFY AND DESCRIBE CURRENT TYPES OF TECHNOLOGY-SUPPORTED EARLY CHILDHOOD PROFESSIONAL DEVELOPMENT PROGRAMS BEING USED IN THE U.S.

Tech-supported PD is defined for this report as: 1) professional development delivered wholly, or in substantial portion, through use of digital technology; and 2) PD where technology use may not be substantial but is critical to the PD fidelity (i.e. video clips of teachers implementing a strategy).

1.1. What are the most common types of tech-supported ECPD?

An internet search for types of technology-supported ECPD (for home-care providers, home visitors, teachers in child care centers, teachers in preschools and early childhood professional development trainers) was conducted. Five categories of tech-supported PD were found (content delivery, video within a PD program, social networks, administrative uses, and specific products), and 14 types of technology-supported ECPD were identified (please see Table 1.1). Often a single PD program integrated several different types of tech-supported PD into the content being delivered. For instance, an online module that teaches a specific strategy may have video exemplars of the strategy embedded in the learning module, as well as a peer-to-peer online discussion encouraging teachers to share their personal experiences of implementing the strategy.

Also, technology support was used frequently in coaching programs, in the form of teacher-recorded video. PD that involves coaching is when an expert teacher (coach) and teacher (learner) meet on a regular basis to discuss new strategies, teaching concepts, etc. An example of a technology-supported coaching model is when the teacher video records herself practicing the strategy in her classroom. The coach then reviews the video and selects a couple of vignettes to discuss with the teacher during their coaching session. The coach and teacher may meet in person to discuss and view the video vignettes or via an online video meeting.

TABLE 1.1 | TYPES OF TECH-SUPPORTED PD OFFERED FOR EARLY CHILDHOOD PROVIDERS AND EDUCATORS

Content Delivery	Description
Distance Learning	Formal PD content is delivered, live, by trainer and is broadcast to several remote sites through satellite or internet. The trainer and learners can interact in real time. Three to four sites can meet at one time using Distance Learning equipment found at ESUs and districts (Network Nebraska).
Online Courses	Formal courses available via the internet. Online courses typically are taken to receive college credit, are offered by a higher education institution, and are led by an instructor.
Online Modules **(also called "sessions" if within an online course)**	A small/defined set of instructional materials focused on one topic, accessed through the internet. The materials typically are viewed in one sitting, self-paced, and usually not led by an instructor. Typically a single module takes one to three hours to complete. May have multiple media components such as pre-recorded lectures or webinars, readings, PowerPoints, exemplar videos to watch, quizzes, assignments, and hyperlinks to pertinent content.
Webinars	Usually used for informal learning. A webinar may be a seminar, lecture, presentation, workshop, or other learning session held over the internet. Organizations and companies offer live and/or archived webinars. Typically 60- to 90-minute seminars are presented by a trainer on a specific topic and accessed through the internet. In live webinars, participants can interact with the trainer and each other through text "chat." A pre-recorded webinar can be watched also.
Video Used Within Professional Development Program	
Video Exemplars	Pre-selected, short video clips demonstrating specific strategies, behaviors, and/or environments. Often embedded in Online Modules.
Video Exemplar Libraries	A collection of video exemplars that can be accessed with a license.
Video of Teacher in Practice • Self and Peer-to-Peer Reflection • Reflection With Coach	During small group meetings that are part of an ongoing in-service training, practitioners view video footage of classroom activities captured by themselves or their peers. The small groups might discuss the instructional concepts and strategies observed in the video and how they relate to those they have studied as part of a course.
Photo of Teacher in Practice	Same as Video of Teacher in Practice, except a still shot. This picture is typically taken by another person (coach or peer).

Social Networks	
Common Social Networks **Communities of Practice - Informal**	Internet-based social media (e.g., Facebook, LinkedIn, Twitter, Instagram) that allows anyone with an account to connect with other individuals via private text, photo, audio and/or video messaging, as well as public spaces to post similar content and hold group discussions. This may include communities of practice or learning communities. Considered an informal form of PD.
Peer-to-Peer Interaction Through a Website **Communities of Practice - Informal**	A public or private website or webpage maintained by an organization or individual, where individuals can regularly post articles, ideas, web links, and a variety of media for others to read and view. The website's owner may also engage in discussions with peers (e.g., via comments on posts), or organize and host communities of practice or learning communities. Considered an informal form of PD.
Forums	Online discussion boards, typically geared toward a particular audience and designed to engage other members of the online community on a particular issue or topic. Considered an informal form of PD.
Administrative	
Virtual Meetings	Learners can meet with video or just audio. Trainer and learner meet via Zoom, Google Hangouts, Skype. Up to eight individual users can meet when all are connected to dedicated broadband, like that found in the public schools and ESUs (Network Nebraska).
Document Management	Online tools to help trainers and providers, such as Google Docs.
Specific Product	
Product or Implementation Training	Online teacher training on how to use a particular assessment measurement or product (i.e. CLASS or ECERS).

1.2. What are specific examples of tech-supported ECPD?

Online Early Childhood Professional Development Offerings

There is a plethora of online learning opportunities for early childhood providers who are looking to improve their teaching practice or earn college credits. Simply searching the internet for "online early childhood professional development" resulted in dozens of possibilities, ranging from training companies offering online modules for CEU credits, organizations and community colleges offering online CDA certifications and associate degrees in early childhood, informal learning modules and webinars, to universities offering online bachelor's and master's degrees in early childhood studies. Table 1.2 includes a list of 40+ websites (out of literally hundreds) that were found via internet searches. Although the content or quality of these online offerings was not evaluated, the list is composed of websites that were found on curated "best of" lists as well as websites and programs that frequently appeared on states' approved online training lists.

TABLE 1.2 | AVAILABLE ONLINE ECPD OFFERINGS

Online Early Childhood Professional Development Offerings (Including Home Visiting) From Organizations, University Extension Groups, and Corporations
*** Better Kid Care** Better Kid Care's On Demand Distance Education system provides early childhood professional development modules online anytime you are ready to learn! From Penn State University Extension. http://extension.psu.edu/youth/betterkidcare
Brazelton Touchpoints Center Brazelton Touchpoints Center® offers professional development programs for individuals and organizations working with young children and their families. Offerings incorporate principles of adult learning theory. http://www.brazeltontouchpoints.org/offerings/professional-development/
California Virtual Campus The California Virtual Campus provides complete, timely, and accurate information about online courses and programs in California higher education, and provides links to resources that support students as they navigate through the complex world of distance education in California. http://www.cvc.edu/
Care Courses School Inc. Care Courses offers online classes and book courses for child care providers and parents. Clock Hours and CEUs. Care Courses also offers Spanish courses in book format. http://www.carecourses.com/Ecommerce/CourseCatalog.aspx
*** Center for Early Education and Development (CEED), University of Minnesota** http://www.cehd.umn.edu/ceed/
Center for Child and Family Studies The Center for Child and Family Studies at WestEd offers a variety of learning opportunities for early care. http://www.cpin.us/preschoolonline/
Center 4 Early Childhood Ed on iTunes The Center for Early Childhood Education is a research and training institute dedicated to enhancing the quality of early care and education. The center develops videos to share research findings and to provide early childhood educators with information and tips they can implement in their classrooms. https://itunes.apple.com/us/itunes-u/early-childhood-education/id488722258
*** Child Care Education Institute (CCEI)** Child Care Education Institute offers over 135 online professional development courses that meet state training requirements and are awarded IACET Continuing Education Units (CEUs). $12/$15 a unit. Annual subscription is $99. http://www.cceionline.edu/index.cfm?id=47
*** Child Care Exchange** Online training courses for early childhood providers. https://www.childcareexchange.com/
*** Child Care Lounge** Child Care Training for Busy Professionals. You can participate in online child care training on your timeline. http://www.childcarelounge.com/child-care-lounge.php

Child Care Training
Child Care Training offers an array of early childhood courses that can be completed anytime, anywhere. Courses range from Child Growth and Development to Professionalism. Courses vary in level of difficulty and number of training hours, and are priced accordingly.
http://www.childcaretraining.org/?pageid=1

Child Development Training Consortium
CDTC provides services, training, technical assistance, and resources to students and in-service professionals.
https://www.childdevelopment.org/cs/cdtc/print/htdocs/home.htm

Collaborative for Children Early Childhood Training Courses
Collaborative for Children offers quality online training for child care professionals. The online courses are self-paced and meet some states' training requirements. $12 each course.
http://collabforchildren.tamu.edu/index.php

CompSAT
CompSAT invites you to join a professional development journey in which you will reflect on your everyday practice, examine what you know and are able to do, and learn and grow at your own pace. Through interactive, multimedia tools, you will enhance your learning, explore your dispositions, and identify your strengths and needs.
http://ececompsat.org/index.html

CONNECT Modules
CONNECT Modules are practice-focused instructional resources for faculty and other professional development providers. Available in Spanish and English.
http://community.fpg.unc.edu/

Council for Professional Recognition
Council administers the Child Development Associate® (CDA) National Credentialing Program.
http://www.cdacouncil.org/

Eager to Learn
Eager to Learn courses provide excellent, accessible educational opportunities to people who care for young children.
http://www.eagertolearn.org/

Early Childhood Investigations
Early Childhood Investigations offers free webinars to early childhood educators. The series is produced by Engagement Strategies, LLC., and presented by leading authors, experts, and leaders. All presenters provide additional resources that may include handouts, links, and other materials.
http://www.earlychildhoodwebinars.com/

Elite Educational Enterprises
Elite Educational Enterprises is here to help professionally develop all early childhood educators and administrators, child care providers, and day care workers. If you are looking for innovative trainings, interactive teachings and group or online sessions that feel like one-on-one time, check this site out!
http://www.eliteresultsnow.com/

*** Environment Rating Scales Institute (ERSI)**
Online Training for Introduction to the Environment Rating Scale
http://www.ersi.info/training_online.html

Erikson Institute
Erikson Institute is an independent institution of higher education that prepares child development and family service professionals for leadership.
http://www.erikson.edu/

Head Start-Quality Teaching and Learning
Fifteen-minute in-service modules were designed as a resource for professional development in busy, active early childhood centers and programs. The modules are organized around one topic or big idea and address effective teaching and assessment practices.
https://eclkc.ohs.acf.hhs.gov/hslc/tta-system/teaching/center/practice/ISS

Iowa State University – Extension
Online Courses, Child Care Training Courses
http://www.extension.iastate.edu/humansciences/el-online

*** The Institute of Child Nutrition (ICN), The University of Mississippi**
http://nfsmi.org/Templates/TemplateDefault.aspx?qs=cElEPTM=

McCormick Center for Early Childhood Leadership
The McCormick Center for Early Childhood Leadership offers a range of engaging professional development opportunities that can help you strengthen your leadership skills and drive organizational change.
http://mccormickcenter.nl.edu/professional-development/

*** NAEYC**
NAEYC's interactive online learning programs allow you to deepen your skills and knowledge anytime, anywhere! Self-paced learning modules connect you with early childhood experts, exclusive video footage and reflective activities all within a community of learners. Some trainings are free and some have a cost.
http://www.naeyc.org/ecp/online

*** NAFCC Training Institute**
High-quality family child care training for every learner, everywhere.
http://www.nafcc.org/index.php?option=com_content&view=article&id=346&Itemid=66

*** Nebraska Department of Education**
First Connections Online course for providers working with infants and toddlers
https://www.education.ne.gov/oec/first_connections.html

Ounce of Prevention Online Home Visitor Training
The Ounce of Prevention offers self-paced online training for home visitors and home visitor supervisors.
http://www.theounce.org/AchieveOnDemand/

The Perpetual Preschool
The Perpetual Preschool is resource that offers on line early childhood education training. Most are priced at $7 each. All of the workshops are self-study and can be completed at your leisure.
http://www.perpetualpreschool.com/

Pro Solutions Training
Pro Solutions Training has more than 100 individual courses available in numerous early care and education and social services subject areas. One-hour courses are only $10 each.
https://www.prosolutionstraining.com/

Quality Assist
Quality Assist provides rigorous and innovative professional development training. Our training is based on scientific research and sound principles of adult learning. We help our clients transform theory into practice. Our high-impact learning experiences are relevant for early childhood.
http://www.qassist.com/pages/online-learning

*** Safeway Certifications**
Online Food Handler Course
https://www.responsibletraining.com/

*** ServSafe**
Online Food Handler Course
https://www.servsafe.com/ss/catalog/productDetail.aspx?ID=1710

Smart Horizons Smart Horizons' online classes cover a wide range of early childhood topics. All courses earn Continuing Education Units (CEUs). Cost starts at $11 per one-hour module. http://www.smarthorizons.org/childcare/
*** Southwestern Child Development Commission** Online Courses, Child Care Training Courses http://www.swcdcinc.org/provider-services/training-and-professional-development.php
*** Teachstone** Online training introduction to CLASS observation scale http://teachstone.com/class-trainings/
Technical Assistance Center on Social Emotional Intervention for Young Children (TACSEI) Free workshops and training videos related to social emotional intervention for young children. http://www.challengingbehavior.org/explore/presentations_workshops.htm
*** Texas A&M AgriLife Extension** Online Courses, Child Care Training Courses http://agrilifeextension.tamu.edu/programs/agrilife-extension-online-courses/
Train Early Childhood Train Early Childhood. com courses available to help you obtain a child development associate (CDA) credential. More than 168 hours of coursework developed by early childhood education experts. http://trainearlychildhood.com/
*** University of Nebraska – Extension** Online Courses, Child Care Training Courses http://www.extension.iastate.edu/humansciences/el-online
Virtual Lab School Ohio State University https://www.virtuallabschool.org/
VOICE/CSEA VOICE/CSEA now offers free online training covering the business side of child care: record keeping, contracts, marketing, legal, insurance, and money management. The training is designed for both experienced and new providers to help them be more successful as a business. http://www.voicecsea.org/training.php

** Indicates the program is on the approved training list for Nebraska.*

1.3. What are the advantages and disadvantages of using tech-supported ECPD?

Online and distance-learning opportunities are gaining the attention of those working to improve access to high-quality professional development for the early education and care workforce (Dede, Jass Ketelhut, Whitehouse, Breit, & McCloskey, 2009).

Advantages

Advantages of using online and tech-supported PD are numerous. Many in-service early childhood professionals have restrictions on their time due to working hours and family obligations. For providers in geographically remote areas, traveling a long distance for training or to attend a class is cost- and time-prohibitive. Online and tech-supported distance learning ameliorates these limitations by providing flexibility for early childhood

professionals to schedule learning when and where it is convenient for them, and at their own pace (Bruder, Mogro-Wilson, Stayton, & Dietrich, 2009; Dede et al., 2009; Ke & Xie, 2009). Early childhood professionals have reported high satisfaction and frequent use when accessing well-designed, high-quality online courses and modules (LoCasale-Crouch, Hamre, Roberts, & Neesen, 2016a). States benefit by offering 24/7 access to systematic, high-quality, standardized, scalable trainings, to all regions of the state, the ability to shift live training resources to meet specialized training needs of their districts or regions, and potential savings from reduced travel time and costs associated with traditional training.

Advantages include:

- Flexibility for learner to choose when and where to access the PD
- Increased access to training, particularly for providers in geographically remote areas
- Reported learner satisfaction with online format and presentation of instructional content
- Standardization of training
- Potential cost savings and shifting of live training resources to specialized needs
- High-quality, systematic, scalable

Disadvantages

A common perceived disadvantage of online learning for early childhood professionals is the providers' lack of face-to-face interaction with the instructor, peers, and especially the children they serve. Working with children is inherently a social, interactive exchange, and questions arise whether strategies and content knowledge learned online can transfer to changes in practice. However, nascent research is offering evidence that online models of high-quality, relationship-based ECPD that includes meaningful interaction among instructors, peers, and children are positively affecting teachers' practices. For instance, some online ECPD programs require early childhood professionals to practice, in their classroom, the strategies learned online. These practice sessions can be video-recorded for later review (online or live) with a coach or mentor.

Perceived disadvantages include:

- The possibility of little or no face-to-face interaction with instructor, peers or children
- Possibility of low participation rates/completion rates
- Possibility of low learner satisfaction
- Possibility of no positive learner effects or change in practice

The following section will review these disadvantages in light of current research, and how these perceived disadvantages are not always true, especially if the ECPD is carefully designed.

1.4. What are obstacles in using tech-supported ECPD?

The spread of tech-supported training has raised concerns about access. Early childhood professionals in rural areas could benefit from tech-supported PD opportunities, but they sometimes have limited access to, and familiarity with, computers and the internet (Weigel, Weiser, Bales, & Moyses, 2012). Furthermore, efforts in states to increase the digital literacy of the early education workforce have been limited. For example, in early childhood education pre-service programs, educators rarely take a course on using educational technology for themselves or their students (Parette, Quesenberry, & Blum, 2010), or receive training once in the field.

This report's findings indicate that some early educators do have the technology skills needed to use and benefit from online modules for professional development. However, many early educators still preferred using both technology and face-to-face (F-2-F) feedback from an instructor or supervisor when engaging in professional development. Also, it was cited by several of the interviewees that early childhood providers, as well as the instructors, need assistance in developing competence at using technology. On-site technical assistance was also cited as being a need for current providers and instructors.

1.5. What are other states offering?

States' Websites for ECPD

Many states offer required training of early childhood core competencies and state early childhood guidelines through online PD modules. These modules are typically created by a state government department or an institution of higher education within the state. The number of online modules offered by each state ranges from just a few to several hundred, and are accessed to fulfill licensing requirements, QRIS requirements, required annual PD hours, or as CDA credits and non-required learning opportunities. Although college courses typically are not included in a state's online offerings, some states provide links to colleges and universities that offer state-approved college courses. Given that most states recently began incorporating online modules to teach the state's core competencies, the literature has not yet addressed this type of PD thoroughly.

Table 1.3 is an exemplar list of states that provide very easy-to-navigate websites dedicated to ECPD for in-service providers. Many of these exemplars have integrated their professional record system and QRIS system with the PD registration. In other words, once the providers register in the state's professional record system, they can register for classes (both online and live) and their profile updates automatically when the module is completed.

TABLE 1.3 | LIST OF STATES WITH EXEMPLAR ECPD WEBSITES

State	Online PD Required EC Guidelines	General Online PD for CEUs	Comprehensive Website Dedicated to ECPD	Website
California	Yes	Yes	Yes	https://www.caearlychildhoodonline.org/login.aspx https://www.childdevelopment.org/cs/cdtc/print/htdocs/home.htm
Illinois	Yes	Yes	Yes	http://ilearning.inccrra.org/
Minnesota	Yes	Yes	Yes	http://mncpd.org/Members/ProfessionalDevelopment.aspx
New York	Yes	Yes	Yes	https://www.ecetp.pdp.albany.edu/index.asp
Virginia	Yes	Yes	Yes	http://virginiaquality.learnpointlms.com/
Washington	Yes	Yes	Yes	https://www.del.wa.gov/professional-development

TOPIC 2: IDENTIFY TECHNOLOGY-SUPPORTED ECPD FEATURES THAT PREDICT QUALITY OUTCOMES FOR TEACHERS AND CHILDREN.

Before addressing this section's key questions on online and tech-supported ECPD, we will first briefly review the core design principles of high-quality, traditional ECPD. This will establish the foundation for identifying and describing high-quality tech-supported ECPD.

2.1. What are the core design principles of traditional ECPD?

Traditional ECPD Design

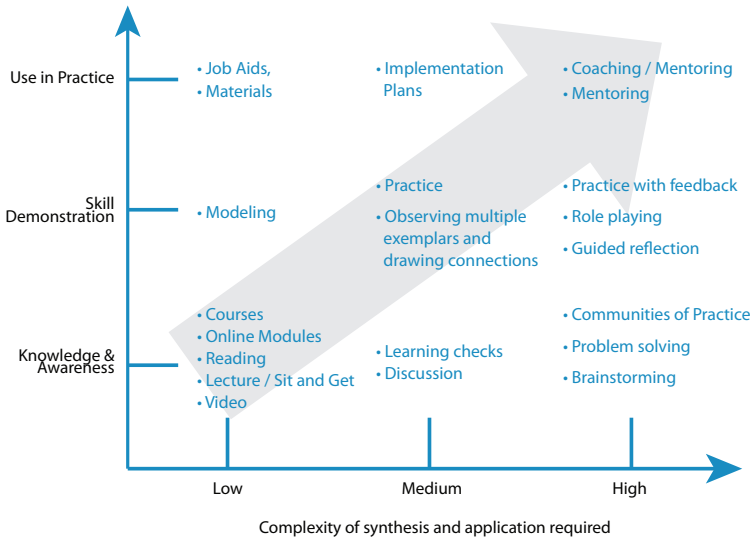
Professional development has been defined as facilitated "learning experiences designed to enhance practitioners' knowledge, skills, and dispositions as well as their capacity to provide high-quality early learning experiences for young children." (Snyder, Hemmeter, & McLaughlin, 2011, p. 188). These learning experiences can be thought of on a continuum ranging from surface learning where the learner simply memorizes content, to deep learning where the learner actively engages cognitively, socially, and affectively to integrate new ideas and behaviors into her/his cognitive and emotional structure (Fink, 2003; Garrison, Anderson, & Archer, 2001). Indeed, research

has indicated that adults learn most effectively when intellectually engaged in new content through experiences situated in authentic contexts (e.g., teachers practicing new strategies in classroom settings), when given opportunities to problem-solve with others, and when they can participate in practice experiences that extended over time (e.g., Bransford, Brown, & Cocking, 2000; Elmore, 2002).

Researchers have recently focused on identifying the core design principles of traditional ECPD most likely to support deep learning and positive change-of-practice for the teacher and improved child outcomes (Desimone, 2009; Dunst & Trivette, 2009; Fukkink & Lont, 2007; R. Pianta et al., 2005; Douglas R. Powell, Diamond, & Cockburn, 2013a; Shannon, Snyder, & McLaughlin, 2015; P. Snyder et al., 2011; Zaslow, 2016). The principles identified by this research include PD that is:

- Clearly articulated, with specific objectives and goals of the PD;
- Focused on a specific curriculum or set of explicit practices rather than general teaching methods;
- Linked to curriculum and instructional goals;
- Grounded in practice implementation;
- Connected with systematic follow-up support (e.g., specific feedback/reflection about practice implementation from a coach or peers);
- Inclusive of reflective practice;
- Collaborative and interactive (collective participation); and
- Sustained over time rather than episodic, one-shot experiences.

FIGURE 2.1 | PROFESSIONAL DEVELOPMENT IN RELATION TO COMPLEXITY OF LEARNING



Adapted from: McCollum & Catlett (1997)

The manifestation of these design principles results in instructional methods that utilize different types of ECPD appropriate for different learning levels. The ECPD (Figure 2.1) shows how PD methods change as learning becomes more complex. The lower left corner illustrates knowledge acquisition. Though considered surface learning, basic knowledge of a new topic provides the conceptual base for deeper learning. Moving upward and to the right, toward deeper learning, learning becomes more complex and situated in context where PD methods include observing model examples, practicing the skills and the addition of coaching (McCollum & Catlett, 1997). Thus, when the desired PD outcome is successful integration of new or enhanced skills in an early childhood provider's practice, the deeper, experiential PD methods with systematic follow-up have been recommended (Bruder et al., 2009; Diamond & Powell, 2011; Snyder, Denney, Pasia, Rakap, & Crowe, 2011).

2.2. What are the core design principles of tech-supported ECPD?

Online and Tech-Supported ECPD

As with traditional PD, the effectiveness of technology-supported PD is largely contingent on the design of the program and the quality of instruction (e.g., Bates et al., 2003; Tindal & Crawford, 2005). Models of high-quality tech-supported PD, specifically for early childhood practitioners, utilize evidence-based adult online learning frameworks that address individual differences, create a real-life context, provide hands-on activities, and encourage learner reflection and social interaction (Bransford et al., 2000; Johnson & Aragon, 2003).

Specifically, models of tech-supported ECPD shown to improve teacher practices and child outcomes (Brown & Woods, 2013; Buysse, Winton, & Rous, 2009; Dunst & Trivette, 2009) incorporate the following design principles:

- Acquisition of knowledge (learn, describe, and identify the PD topic through online lectures, reading assignments, PowerPoints, video activities, quizzes, etc.)
- Observation (view situated video exemplars of the PD topic)
- Practice (implement newly learned skills in work setting; participate in offline activities that reinforce topic concept)
- Discovery (reflection on the activities and/or implementation experience, independently or with a coach)

Learner satisfaction of online coursework is promoted by an easily navigable design of well-structured multimedia content that integrates frequent online interactions between learners and instructors, as they construct knowledge collaboratively (Ke & Xie, 2009). This design includes multiple components of media (e.g., online courses, video exemplars, assignments to practice the instructional content in a real-life context, use

of technology for recording practice sessions for review later, and assignments for self-reflection and reflection with peers or expert coaches) that can have meaningful impacts on teachers' behaviors and children's outcomes (Buysse et al., 2009; Dunst & Trivette, 2009).

2.3. What research exists about tech-supported ECPD?

Literature Review of Tech-Supported ECPD

Although the use of technology-supported PD to educate and train early childhood care providers has increased dramatically (Gill, 2011), studies of its effectiveness within the context of early childhood programs are nascent (Diamond, Justice, Siegler, & Snyder, 2013; NAEYC, 2012). This literature review includes studies demonstrating the effectiveness of online modules and embedded technology in regard to teacher and/or child outcomes. Teacher satisfaction with online learning modules is also addressed. A handful of studies investigating online communities of practice was also included in the review. Most of the studies found during the literature search reported on the use of online modules with embedded multimedia components like video exemplars, and often in combination with technology-supported coaching models. Remarkably, no empirical research on the effectiveness of webinars was found, although dozens of cost-free webinar websites exist for early childhood teachers (see Table 1.2 for websites offering webinars).

Please see Table 2.1 at the end of this section for the studies selected for this report.

Teacher Satisfaction

Learner satisfaction in online learning experiences has been shown to be an important indicator of the learner's cognitive outcomes from course participation (Liao & Hsieh, 2011). The following studies addressed teacher satisfaction when using tech-supported ECPD.

Stone-MacDonald & Douglass, 2014

Stone-MacDonald & Douglass examined one state's effort to deliver required QRIS training to early childhood providers using online courses. The courses covered the state's core competencies, early learning standards, and content knowledge, and were available fully online for self-study, or as an instructor-led blended or face-to-face course. Statewide trainers were trained on how to integrate the online courses in the blended and F-2-F formats. At the end of a 10-month period, the trainers and teachers who participated in the study (N = 800) were surveyed about their experiences with the online modules. Seventy-five percent reported being comfortable or very comfortable with computers. Sixty-nine percent of the participants chose to complete the online

modules with a trainer, and 60% responded that they preferred including face-to-face interactions for PD (i.e., blended learning). Overall, participants liked the format and flexibility of the online modules, rating these items above a 3.75 on a 5-point scale. And although 100% of the participants reported having access to a computer at home or work, the trainers reported technology as an obstacle in their delivery of the training (e.g., slow WiFi, no access, old technology).

LoCasale-Crouch, Hamre, Roberts, & Neesen, 2016

The recent in-depth study examined early childhood providers' use of and satisfaction with two online courses designed to provide an effective and scalable approach to enhancing teachers' classroom practices. The researchers examined completion rates of the two courses, teachers' use of the optional online discussion board, teachers' level of satisfaction with the online courses, and teacher characteristics predicting participation. Using a randomized four-condition design, 57 early childhood teachers were randomly assigned to one of four conditions: 1) online course only; 2) online course plus a reflective writing assignment; 3) online course plus conferences with a coach; or 4) no course. The two online courses contained 14 total sessions and each session contained five to eight video-based lessons, readings, quizzes and tests, assignments, and interactive activities with colleagues. The reflective writing condition included prompts to help teachers reflect on their teaching practices. The conference condition included six telephone calls with a coach per session. Also, the three treatment conditions had the option to participate in an online discussion board.

Findings indicated that nearly 80% of teachers initially enrolled finished both online courses, completing most of the required core components. Participants also recorded high rates of satisfaction, during and after the course, particularly those with a lower level of education. The high completion rates and satisfaction suggest that participants found the material to be interesting and engaging and highly relevant to their teaching.

Regarding the predictors of participation, teachers who had coaching sessions were less likely to complete homework and post on discussion boards compared with the course-only teachers. It is possible that the time required to do all of the components in this condition was too much, and, the course-only participants might have seen the discussion board as a way to engage with others and find social support. Conversely, teachers taking the course for college credit were more likely to complete homework, as well as participate on the optional discussion board.

A further note on the findings regarding the discussion board: age, condition, and comfort with technology were significant predictors of discussion board posts. Older

teachers posted on the discussion board more than younger teachers. Teachers in the coaching and reflective writing conditions contributed fewer posts than teachers in the course-only condition. Furthermore, teachers who reported more comfort with technology posted less on the discussion board. However, teachers who took the course for credit were more likely to participate in the discussion board compared with teachers who did not take the course for credit.

Distance Learning

Research has shown that distance-learning performance outcomes compare favorably to traditional face-to-face instruction (Sitzmann, Kraiger, Stewart, & Wisher, 2006; Tallent-Runnels et al., 2006) and in some cases, distance learning can result in better performance and user satisfaction measures when compared with traditional classroom-based courses (Discenza, Howard, & Schenk, 2003).

DeLuccie, 2002

DeLuccie reported on the distance degree program created by Kansas University and Kansas State University, in partnership with Head Start, to meet the needs of Head Start teachers who wanted to obtain a bachelor's degree or teaching certification in early childhood education but were unable to access higher education because of geographic distance. The study examined student satisfaction with the distance-learning program. Although this study dates back to 2002, the core concept of distance learning has not changed. The delivery quality has improved remarkably in the last 14 years. However, the information regarding distance learning and student satisfaction is still relevant today. In partnership, the university researchers and Head Start directors designed, implemented, and evaluated a three-year program of professional education delivered via broadcast of live instruction to remote sites of the state (1997-2000). The distance learning approach included video-conferencing of a live instructor to remote sites supplemented with videotaped presentations, individualized and self-paced assignments, real-life work experiences, and an annual five-day summer seminar. This article focused on the experiences of 28 Head Start teachers and assistant teachers enrolled in the project. Twenty percent of the participants were first-generation college students. The majority of students lived in communities with populations under 5,000.

Evaluative outcomes of program quality included learning success, relevance and practicability of curricula, completion rates, and quality of delivery strategies, instruction, and mentoring. Evidence of program success was supported by multiple sources. For instance, Head Start supervisors were extremely positive about the impact of the program and documented changes in participants' work, behavior, and their interactions with children. They also believed that the participants' involvement in the three-year

course motivated other staff to work toward their degrees. The graduating seniors all agreed that the experience benefited them either "much" (30%) or "very much" (70%). Students indicated that the distance learning was effective, and the formats of case study, lecture, classroom observations, assignments, discussion, and especially the week-long summer seminars attended by all of the students and professors were valuable to their learning process. Students specifically indicated their appreciation for the opportunity to complete their degrees from a distance, citing convenience. At the end of the program, 14 of the 28 students had finished the program and earned a bachelor's degree and 12 of the 28 had earned their teacher certification.

Online Modules

Brown & Woods, 2012

In a study of online module use for ECPD, Brown & Woods examined the impact, feasibility, and provider satisfaction of a five-unit (total of 30 hours) multicomponent online PD course designed for infant/toddler early intervention providers. Providers (N = 21) completed the self-paced online course in eight months. Each unit provided reading materials, video exemplars, assignments, and email feedback on the assignments from an instructor. Based on video of home visits taped at the end of the study, findings indicated that providers successfully applied the various skills learned from the online content. The providers reported high satisfaction with the learning experience, giving highest ratings to the video exemplars and narrated presentations included in the modules.

Hamad, Serna, Morrison, & Fleming, 2010

Hamad, Serna, Morrison & Fleming studied the use of online modules for knowledge acquisition of behavior intervention (BI) strategies when working with young children with Autism Spectrum Disorder. Fifty-one participants with little or no training of BI strategies (professionals, paraprofessionals, and parents of children with autism) completed a three-module online course. The modules' content included short online lectures, practical exercises, video exemplars, study questions, and frequent short online quizzes, and were completed in approximately 18 hours during a three-week time period. The same test was given pre- and post-study to assess BI knowledge. A highly statistically significant difference (paired t-test, $p<.0001$) between the mean pre-test score (64.2%) and post-test score (82.2%) was found for all participants combined. The effect size of this pre- to post-test difference was 1.92. In the satisfaction survey, 86% of the participants found the content of the modules to be just right for a beginning practitioner, and 71% found the strategies applicable in their work/daily life. In rating the level of satisfaction, participants reported being mostly or extremely satisfied with the online learning experience.

Video Exemplars

An online ECPD program often will utilize video exemplars as a main instructional strategy. Video exemplars typically are annotated video examples of teachers implementing a specific strategy, behavior, or interaction within the classroom. The demonstration may intentionally illustrate varying degrees of quality implementation, but typically videos are models of high-quality implementation. Video exemplars help teachers critically analyze classroom behaviors and interactions and model high-quality practices. Furthermore, video exemplars have been found to be more effective than textual descriptions in developing teachers' pedagogical knowledge (Moreno & Ortegano-Layne, 2008).

Numerous studies have been done on a particular technology-supported PD approach called MyTeachingPartner (MTP), which incorporates a large library of video exemplars in its instructional content. This web-based, online professional development program focuses on developing high-quality teacher-child interactions. MTP includes video exemplars of high-quality teacher-child interactions and can include virtual consultations with a coach (based on self-recorded video of the teacher's interactions in her classroom). Central to the MTP approach is that all observations of classroom interactions, as well as feedback and support to teachers, are based upon a standardized framework for defining and observing classroom interactions, the Classroom Assessment Scoring System (CLASS; Pianta, Karen, Paro, & Hamre, 2008).

Kinzie et al., 2014

Different formats of MTP and how the formats related to child outcomes were examined by Kinzie and colleagues. The year-long implementation of the MTP Math and Science curricula involved 44 PreKindergarten teachers and 444 children from low-income families. Teachers were randomly assigned to one of three groups: 1) use of the paper-based MTP-math/science basic curricula, 2) use of the paper-based curricula plus access to the MTP online teacher support, or 3) to a control group that used the HighScope curricula. The MTP online supports included video exemplars of high-quality teacher-child interaction and implementation of the math/science curricula (over 130 videos), a weekly video of teaching challenges with a reflective question, videos illustrating 10 teaching dimensions, and brief teaching tips. The treatment groups also received about 30 hours of workshop training on the MTP-math/science curricula throughout the year. After a year of implementing the curricula, children whose teachers were in the "online" group made greater gains in geometry and measurement, compared with those in the control and paper-based classrooms. Children in "online" classrooms also performed better on the number sense and place value assessment than did those in the paper-based and the control classes.

Video of Teachers' Practices

A teacher's ability to assess his or her own instructional practices is crucial to improving effectiveness (McFarland, Saunders, & Allen, 2009). Yet it has been found that teachers tend not to self-assess, nor are their perceptions of their teaching performance often accurate (McFarland et al., 2009). Having access to accurate information about their performance in the classroom helps teachers to identify needs and develop a plan to improve instruction (Slider, Noell, & Williams, 2006).

Videotaping their own classroom instruction offers teachers the ability to analyze their performance and set goals for improvement (McFarland et al., 2009). Deasy (1991) found that when given a choice between traditional evaluation and video-based self-evaluation, teachers preferred video-based self-evaluation by approximately a 2-to-1 ratio.

Video for Self-Reflection

Wright, Ellis, & Baxter, 2012

In a study from Wright, Ellis, & Baxter, 51 Head Start teachers utilized video to self-reflect and self-evaluate their use of general and specific praise in their classrooms. All participants were videotaped interacting with the children in their classroom for five to 10 minutes on three consecutive days. (e.g., video 1, video 2, and video 3, respectively). The same day after the taping of video 1, two experimental groups, Group A and Group B, were trained to define and discriminate among types of praise behavior by viewing videos. A trainer also showed them how to self-evaluate by recording frequency data from a video, evaluating performance against a standard, and writing a goal statement. After the videotaping on day two, Group A viewed video 2 and did the self-evaluation immediately following the videotaping. Group B viewed Day 2's video on Day 3 and did the self-evaluation steps, just before taping video 3. The control group was videotaped three times but did not receive the training and did not do a self-evaluation. Trained data collectors viewed all of the videos and coded the frequency of the targeted behaviors. Teachers in the experimental groups (viewed video examples and self-evaluated their own videos) exhibited a significantly higher frequency of specific praise and general praise than teachers in the control group. There was no statistical difference in frequency of either types of praise between the immediate and the delayed self-evaluation. The results suggest that video-based self-evaluation may be an effective professional development activity for Head Start teachers.

Coaching-Video Feedback and Video Exemplars

There is growing evidence that a coach's use of teachers' video-recorded instruction to provide individualized feedback is effective (Downer, Pianta, Fan, Hamre, & Justice, 2011; Fukkink & Lont, 2007; Mashburn, Downer, Hamre, Justice, & Pianta, 2010; R. C. Pianta, Mashburn, Downer, Hamre, & Justice, 2008; Douglas R. Powell, Diamond, &

Cockburn, 2013b). Video feedback can function as a catalyst for critical reflection and provides a basis for mutual dialogue about teaching practices (Virmani & Ontai, 2010).

Pianta, Mashburn, Downer, Hamre, & Justice, 2008

Another study also involving the MyTeachingPartner (MTP) program was a controlled evaluation trial examining the differences in teacher-child interactions between differentiated delivery modes of MTP. Head Start teachers (N = 113) were assigned to one of two conditions for one year: 1) The MTP online PD materials for language and literacy or 2) the same online access plus a biweekly consultation with a coach using virtual conferencing. MTP's online PD materials included lesson plans and video-clip exemplars of high-quality teacher-child interactions. The remote coach consultation involved performance-based feedback drawn for a video of the teacher implementing one of the online activities. Teachers receiving the remote coaching showed significantly greater improvements in teacher-child interactions than did those only receiving access to the online videos and materials in three of the seven teacher interactions measured: the quality of teacher sensitivity, instructional learning formats, and language modeling (as measured by the CLASS). Teachers who were coached also showed greater improvements in interactions involving reading and responding to students' cues, using various formats to engage children in instruction, and intentional language provocations that promote development. The positive effects of coach consultation were particularly evident in classrooms with higher proportions of children who experienced economic risks.

Mashburn, Downer, Hamre, Justice, & Pianta, 2010

Downer, Pianta, Fan, Hamre, Mashburn, & Justice, 2011

The study described above (Pianta, et al., 2008) was repeated by Mashburn and colleagues in 2010 (N = 134 teachers) and by Downer and colleagues in 2011 (N = 161 teachers), both of which examined the effects of the MTP program on children's language and literacy outcomes. In the Mashburn study, children whose teachers received access to both the online video exemplars and coach consultation made greater gains in receptive language skills over the year compared with children whose teachers received access only to the video exemplars, with an effect size of d = .27. In the Downer study, a control group was added: teachers received the MTP activities in print and online but no access to the video exemplars and coaching. Relative to the control condition, there was a significant improvement in the language and literacy measures of the children with teachers in the online plus coach consultation, albeit a small effect (d = .11). No significant difference was found in the scores from the teachers using only online compared with the control group.

Zan & Donegan-Ritter, 2014
This research examined the impact of an eight-month intense program of CLASS (Classroom Assessment Scoring System) PD. The PD program involved monthly cycles of video-based self-reflection, peer reflection, coaching, and bimonthly interactive in-person workshops (three hours) focusing on selected dimensions of the CLASS. Sixty Head Start teachers were assigned to either a treatment group (N = 38) or a comparison group (N = 22). Each treatment group teacher was videotaped twice monthly for 15 – 20 minutes. This teacher and her assistant teacher watched the video in private and then completed a written guided reflection activity. A few days later, they met for a short peer-mentoring meeting to discuss their reflections. Shortly after the peer meeting, the teachers met with a coach who had viewed the video and scored the interaction using the CLASS protocol. For approximately an hour, the coach and teachers discussed the insights gained from the self-reflection and peer meeting. The comparison group did not receive these components of training.

Changes in the quality of teacher-child interactions as measured by CLASS were examined. The treatment group displayed significant increases in four dimensions related to behavior management, productivity, language modeling, and quality of feedback. Similar patterns of change were found for teachers with and without college degrees.

Coaching-Video Feedback and Online Modules

Landry, Anthony, Swank, & Monseque-Bailey, 2009
In this study, Landry and colleagues tested three common components of ECPD: online ECPD modules, coaching, and the use of progress monitoring to inform early literacy instruction. All teacher participants (N = 262) accessed online PD modules that included extensive video exemplars narrated with expert commentaries, online assignments, and assessments. The course also included small group online interaction sessions, led by a facilitator, where teachers practiced specific skills with the small group and reflected about their experiences in their classroom.

In a 2 x 2 experimental design, two of the four groups received coaching twice a month (which included feedback on the teacher's video of strategy implementation), with the other two groups not receiving coaching. One group from each of the coached and non-coached groups used a software program that assessed the children and then suggested activities for the children based on their scores. The counter group used the instruction manual to give the assessments and determine the children's activities.

Results indicated that all of the conditions achieved higher teacher and child outcomes than a control group who received no PD, showing that the online training was effective overall. The teachers who had the most comprehensive training of twice-a-month

coaching coupled with the use of the assessment software showed a significant improvement in their practice, and had the highest child outcomes with moderate to large effect sizes. Coaching was found to be important for teachers who were less familiar with instructional practices in phonological awareness and writing. Also, the success of the program was thought to be a result, in part, of the online network of learners that was guided by a facilitator.

Kyzar, Chiu, Kemp, Aldersey, Turnbull, & Lindeman, 2014

This study of a PD program for Part C early intervention home visitors (N = 40) examined the feasibility of home visitors accessing a weekly online PD module coupled with a weekly individual, in-person meeting with a coach for six weeks. Each weekly online module taught a strategy through reading materials and video exemplars, followed by a quiz, and assignments (written self-reflection and a self-video of implementation), all of which were sent to the coach. The coach reviewed the video and prepared feedback, which was given to the home visitor the following week during their in-person meeting. The home visitors rated the online modules on a scale of 1 low – 5 high, for usability (3.69), practicality (2.55), content (3.94), and helpfulness of the module's instructional elements (3.97). The practicality scores were lower because the online module took longer than expected to complete. Kyzar et al. reported that practitioners found the module's instructional elements very useful, but also reported the coaching aspect was the most supportive of their understanding and use of the materials. The practitioners and mentors felt the coaching component could be completely online with virtual coaching, as long as the first meeting with the coach was face-to-face. Mentors reported concerns about the practitioners' comfort with using technology for virtual coaching sessions and thought support may be needed.

Shannon, Snyder, & McLaughlin, 2015

In this qualitative study, the approaches of web-based self-coaching and onsite coaching were explored. Twenty-four preschool teachers who taught preschool children with disabilities were assigned to one of two conditions: workshops plus self-coaching via a website (N = 12) or workshops plus on-site coaching (N = 12); Teachers in both conditions received 16.5 hours of in-person PD on embedded instructional practices across four to six weeks. For the on-site coaching group, a coach conducted a live observation of the teacher's classroom, followed by a meeting between the coach and teacher that included reflection and performance feedback. Coaches had access to video exemplars to use during the session. On-site coaching occurred every other week for 16 weeks and the coach would contact the teacher on the off weeks either via email or video conferencing. For the self-coaching group, teachers used a website designed to assist in self-coaching, received training on navigating the website, how

to view the video exemplars and tip of the week, and how to access the self-coaching instructions and forms. The self-coaching model aligned with the on-site coaching protocol (e.g., self-assessment of needs, goal-setting, self-evaluation of instruction, and child outcomes). The teachers could also upload video of themselves teaching to receive online feedback from a coach. The teachers had access to the self-coaching website for 16 weeks. The teachers also were sent a weekly email from research staff that encouraged them to visit the website and engage in the self-coaching process.

Social validity data were gathered from six focus groups. The teachers in both treatment groups reported being more aware of their children's individual preferences and abilities as a result of the PD. Both groups also thought the use of video exemplars was valuable. Conversely, the teachers in the self-coaching group reported that self-coaching in a web-based delivery format required a strong grasp of the content, self-motivation, and technological self-efficacy to successfully access the available supports. However, even teachers who possessed all of these characteristics still described implementation to be challenging in the absence of a network of support or accountability. And as one would expect, the onsite-coaching condition provided the teachers participation in a collaborative partnership, accountability for implementation, and consistent supportive and constructive feedback, which the participants associated with their improved self-efficacy and implementation of the PD model. These outcomes were not reported to the same degree by the self-coaching teachers.

Regarding the use of technology, teachers agreed that prior to offering web-based PD, providers should assess teachers' technological self-efficacy and baseline knowledge of the delivery format, provide individualized technology training, provide adequate internet access and bandwidth, and make on-site technical assistance available.

Virtual Coaching-Video Feedback

Marturana & Woods, 2012

This study evaluated the effects of distance coaching, via virtual conferencing, for home visitor early interventionists. After three face-to-face training workshops, 34 home visitors paired into 17 peer teams and were each videotaped engaging with a family during a home visit. The videos were sent to their coach who, upon receiving them, scheduled a Skype with the peer team. During the Skype call, the coach and the two peer home visitors viewed and discussed clips of the videos that had been selected by the coach. After the Skype call, the coach emailed the edited videos together with summaries of the feedback and plans for the next video. The videotaping and coaching sessions occurred once a month for eight months.

Findings indicated that the distance coaching PD model was associated with increased use of caregiver coaching strategies and routine contexts. Specifically, participants spent significantly less time in child-focused intervention and more time using specific coaching interactions with the caregiver and child after participating in the technology-supported, performance-based feedback. When asked about the most satisfying aspect of the distance mentoring, the providers mentioned the interactive nature of the feedback (78%), watching the video clips of their own home visit sessions (30%), and the convenience of the coaching sessions (13%).

Piasta et al., 2012

This study from Piasta et al., investigated the effect of professional development on preschool teachers' conversational responsivity in the classroom. Conversational responsivity is defined as teachers' use of strategies to extend children's conversations (communication-facilitating strategies) and to expose children to advanced language (language-developing strategies). Forty-nine preschool teachers participated and every two weeks throughout the academic year, all of the teachers videotaped 20 minutes of their classroom interaction. The teachers were randomly assigned to two groups. The treatment group teachers received 15–20 hours of in-person PD on conversational responsivity, wrote a reflection on their videos, and received written feedback (email) about their videos from a coach. The business-as-usual control group received the same amount of in-person PD on a different topic and did not receive any feedback on their videos. Growth curve analysis indicated that the treatment group teachers used significantly more communication-facilitating strategies across the year. However, no difference was detected for language-developing strategies. Moreover, children in the treatment classrooms showed greater use of language and complexity in their talk.

Artman-Meeker, Hemmeter, & Snyder, 2014

The purpose of this pilot study was to compare the effects of workshop training and distance coaching PD on teachers' implementation of the Pyramid Model. Participants (33 Head Start teachers) participated in six hours of in-person workshop training on the Pyramid Model and wrote their own action plans to support model practices. Two groups were randomly assigned. The workshop plus distance coaching group (N = 16) received eight distance coaching sessions via email and website. For each weekly distance coaching session, the coach viewed a video of the teacher implementing a strategy and edited together short clips that demonstrated best practices or missed opportunities, and wrote feedback. The video and clips were then posted on the project's website, and the feedback emailed to the teacher. The workshop-only group (N = 17) did not receive follow-up support after the workshop. The group that received

distance coaching showed small but statistically significant improvements in emotional, organizational, and instructional classroom interactions (as measured by the CLASS). However, this group did not show a greater implementation of the Pyramid Model. As reported in other studies (Powell et al., 2010; Whitaker, Kinzie, Kraft-Sayre, Mashburn, & Pianta, 2007) there was wide variability in the teachers' use of the website and coaching sessions.

Douglas R. Powell, Diamond, Burchinal, & Koehler, 2010

Powell and colleagues investigated the effects of a literacy-focused PD intervention involving coaching. The randomized controlled trial with 88 Head Start teachers and 759 children also examined the differential effects of virtual coaching sessions versus in-person coaching sessions. The group with on-site, in-person coaching met with a coach bi-weekly for one semester. During the meeting, the coach observed the teacher interacting in her classroom for 90 minutes. The teacher and coach then met for a 30-minute feedback session. The group involved in the remote, virtual coaching condition submitted a 15-minute video, bi-weekly, of a targeted instructional practice to the coach for review. The coach selected segments of the teacher's video and delivered comments about the segment using a split screen software where the comments would appear beside the video. The coach's feedback also included direct links to video exemplars with articulated points of involved strategies (total of 97 available videos) and other pertinent articles and materials. While the on-site teachers did not have access to these videos, the coach could bring the videos to show the teachers. The one-semester PD intervention had significant positive effects on general classroom environment and on children's letter knowledge (d = 0.29), blending skills (d = 0.18), writing (d = 0.17), and concepts about print (d = 0.22). There were no differential effects of remote versus on-site delivery of literacy coaching. Results of this study showed tech-supported remote delivery of literacy coaching to be a promising alternative to in-person visits.

A follow-up study by Diamond (2013) suggested that the on-site and remote coaching methods offered distinctive and complementary feedback to the teachers. Feedback in on-site sessions contained more unique feedback and greater attention to extension and individualization of practices. Remote coaching, when the coaches reviewed videos, contained more feedback on core practices. This may be interpreted as evidence in support of including periodic in-person sessions together with tech-supported PD delivery.

Online Communities of Practice

Informal online communities and networks offer teachers the possibility of engaging in shared learning, constructing knowledge, reflecting about teaching practices and receiving emotional support. Networks and communities can take different forms such as discussion boards, peer-to-peer online mentoring, weekly focus groups, and collaborative projects. Research on these social learning networks consists mainly of case descriptions using a wide sampling of theoretical and methodological approaches.

Research linking the effects of online learning communities in PD programs to changes in teachers' classroom practices are, as of yet, non-existent (Macià & García, 2016). Nonetheless, studies report that participation in online communities has positive effects on professional development. For instance, it has been shown that online communities can stimulate teachers' self-reflection on their practice and prompt inquiries about new methods and resources, giving teachers new insights on their practice (Musanti & Pence, 2010). Furthermore, combining online participation with other forms of PD delivery provides multiple engagement spaces to help teachers contextualize their practice experiences and engage in construction of new professional knowledge (Blummer & Kritskaya, 2009).

Also, research has revealed that participation in online environments is bolstered by face-to-face contact (Tseng & Kuo, 2014). Several studies show that participation in online-only groups is not as strong as participation in communities where people convene both online and in person. Research has shown that teachers prefer face-to-face professional learning communities although they also report the combination of online and face-to-face activities are effective (McConnell, Parker, Eberhardt, Koehler, & Lundeberg, 2013).

Despite the increasing interest in informal online communities and networks, the impact on teachers' knowledge acquisition, skill development and integration of new skills into practice is still unknown. Further studies are needed to identify the factors that promote participation in online networks and communities and how these communities influence teachers' learning and reflection, and ultimately, the transformation of their practice.

Summary

The research examining online and tech-supported ECPD, though nascent and growing, has begun to suggest that online learning can be just as effective in enhancing early childhood providers' knowledge, skills, and professional competencies as face-to-face trainings, and that these outcomes are maximized when there is a blend of online independent study and trainer/coach-mediated consultations using video recordings of the teacher's practice (Kyzar et al., 2014; R. C. Pianta, Mashburn et al., 2008; Shannon

et al., 2015; Wright et al., 2012). Research also has shown online PD programs that included video exemplars, alone and when combined with coaching, were associated with improved children's literacy skills (Downer et al., 2011; Diamond & Powell, 2011; Landry et al., 2009; Mashburn et al., 2010; Piasta et al., 2012) and math skills (Kinzie et al., 2014). Studies examining the use of virtual meetings with a coach showed the virtual meetings to be just as effective as face-to-face meetings, as long as the first meeting with the coach was in person (Marturana & Woods, 2010; Powell et al., 2010). Furthermore, teachers reported high rates of satisfaction when using online modules, especially when combined with coaching that implements teacher-recorded video (Brown & Woods, 2012; Hamad et al., 2010; LoCasale-Crouch et al., 2016; Stone-MacDonald & Douglass, 2015).

TABLE 2.1 | EARLY CHILDHOOD PROFESSIONAL DEVELOPMENT ARTICLES, BY TECHNOLOGY AND TYPE OF CHILD CARE

Type of Child Care: F = Family-based, C = Center-based, P = Preschool, HS = Head Start, HV = Home Visitation Programs, IT = Infants/Toddlers, S = Special Education

Literature	Video exemplars	Feedback from coach or trainer using video	Virtual meetings for coaching or training	Video self reflection	Feedback from peers using video	Online courses or modules	Online communities of practice	Type of child care
Artman-Meeker, K., Hemmeter, M. L., & Snyder, P. (2014). Effects of Distance Coaching on Teachers' Use of Pyramid Model Practices. Infants & Young Children, 27(4), 325–344.		X						HS
Brown, J. A., & Woods, J. J. (2013). Evaluation of a Multicomponent Online Communication Professional Development Program for Early Interventionists. Journal of Early Intervention, 34(4), 222–242.	X					X		IT, HV, S
DeLuccie, M. F. (2002). Beyond the child development associate credential: Educating head start teachers to work with children and families in the 21st century. Journal of Early Childhood Teacher Education, 23(3), 235–244.						X		HS
Downer, J. T., Kraft-Sayre, M. E., & Pianta, R. C. (2009). Ongoing, web-mediated professional development focused on teacher–child interactions: early childhood educators' usage rates and self-reported satisfaction. Early Education and Development, 20(2), 321–345.	X	X	X					P Low Income
Fukkink, R. G., & Tavecchio, L. W. C. (2010). Effects of video interaction guidance on early childhood teachers. Teaching and Teacher Education, 26(8), 1652–1659		X		X				C Europe
Gerde, H. K., Duke, N. K., Moses, A. M., Spybrook, J., & Shedd, M. K. (2014). How Much for Whom? Lessons From an Efficacy Study of Modest Professional Development for Child Care Providers. Early Education and Development, 25(3), 421–441.		X						C,P
Hamad, C. D., Serna, R. W., Morrison, L., & Fleming, R. (2010). Extending the Reach of Early Intervention Training for Practitioners: A Preliminary Investigation of an Online Curriculum for Teaching Behavioral Intervention Knowledge in Autism to Families and Service Providers. Infants and Young Children, 23(3), 195–208.						X		S
Kinzie, M. B., Whittaker, J. V., Williford, A. P., DeCoster, J., McGuire, P., Lee, Y., & Kilday, C. R. (2014). MyTeachingPartner-Math/Science pre-kindergarten curricula and teacher supports: Associations with children's mathematics and science learning. Early Childhood Research Quarterly, 29(4), 586–599.	X	X	X					P Title 1
Kyzar, K. B., Chiu, C., Kemp, P., Aldersey, M., Turnbull, A. P., & Lindeman, D. P. (2014). Feasibility of an Online Professional Development Program for Early Intervention Practitioners. Infants & Young Children, 27(2), 174–191.		X				X		S

Literature	Video exemplars	Feedback from coach or trainer using video	Virtual meetings for coaching or training	Video self reflection	Feedback from peers using video	Online courses or modules	Online communities of practice	Type of child care
LoCasale-Crouch, J., Hamre, B., Roberts, A., & Neesen, K. (2016). If You Build It, Will They Come? Predictors of Teachers' Participation in and Satisfaction with the Effective Classroom Interactions Online Courses. The International Review of Research in Open and Distributed Learning, 17(1).	X	X	X	X		X		P Low Income
Landry, S. H., Anthony, J. L., Swank, P. R., & Monseque-Bailey, P. (2009). Effectiveness of comprehensive professional development for eachers of at-risk preschoolers. Journal of Educational Psychology, 101(2), 448.	X		X					P Low Income
Macià, M., & García, I. (2016). Informal online communities and networks as a source of teacher professional development: A review. Teaching and Teacher Education, 55, 291-307.							X	K-12
Marturana, E. R., & Woods, J. J. (2012). Technology-Supported Performance-Based Feedback for Early Intervention Home Visiting. Topics in Early Childhood Special Education, 32, 14–23.		X						HV
Mashburn, A. J., Downer, J. T., Hamre, B. K., Justice, L. M., & Pianta, R. C. (2010). Consultation for teachers and children's language and literacy development during pre-kindergarten. Applied Developmental Science, 14(4), 179–196.	X	X	X					P Low Income
Pianta, R. C., Mashburn, A. J., Downer, J. T., Hamre, B. K., & Justice, L. (2008). Effects of web-mediated professional development resources on teacher-child interactions in pre-kindergarten classrooms. Early Childhood Research Quarterly, 23(4), 431–451.	X	X	X					P Low Income
Piasta, S. B., Justice, L. M., Cabell, S. Q., Wiggins, A. K., Turnbull, K. P., & Curenton, S. M. (2012). Impact of professional development on preschool teachers' conversational responsivity and children's linguistic productivity and complexity. Early Childhood Research Quarterly, 27(3), 387–400.		X						P
Powell, D. R., & Diamond, K. E. (2013). Implementation fidelity of a coaching-based professional development program for improving Head Start teachers' literacy and language instruction. Journal of Early Intervention, 35(2), 102–128.	X	X	X					HS
Powell, D. R., Diamond, K. E., Burchinal, M. R., & Koehler, M. J. (2010). Effects of an early literacy professional development intervention on head start teachers and children. Journal of Educational Psychology, 102(2), 299.	X	X						HS
Shannon, D., Snyder, P., & McLaughlin, T. (2015). Preschool teachers' insights about web-based self-coaching versus on-site expert coaching. Professional Development in Education, 41(2), 290–309.	X					X		P
Tseng, F. C., & Kuo, F. Y. (2014). A study of social participation and knowledge sharing in the teachers' online professional community of practice. Computers and Education, 72, 37–47.							X	All Ages

Literature	Video exemplars	Feedback from coach or trainer using video	Virtual meetings for coaching or training	Video self reflection	Feedback from peers using video	Online courses or modules	Online communities of practice	Type of child care
Whitaker, S., Kinzie, M., Kraft-Sayre, M. E., Mashburn, A., & Pianta, R. C. (2007). Use and evaluation of web-based professional development services across participant levels of support. Early Childhood Education Journal, 34(6), 379–386.	X	X	X					P
Wright, M. R., Ellis, D. N., & Baxter, A. (2012). The effect of immediate or delayed video-based teacher self-evaluation on Head Start teachers' use of praise. Journal of Research in Childhood Education, 26(2), 187–198.				X				HS
Zan, B., & Donegan-Ritter, M. (2014). Reflecting, coaching and mentoring to enhance teacher–child interactions in Head Start classrooms. Early Childhood Education Journal, 42(2), 93–104.	X			X				HS
Totals:	24	13	15	9	4	0	6	2

TOPIC 3: IDENTIFY AND DESCRIBE NEBRASKA'S POPULATION DISTRIBUTION AS IT RELATES TO ECPD AND DESCRIBE NEBRASKA'S INTERNET BROADBAND INFRASTRUCTURE FOR SCHOOLS.

To better understand how ECPD is delivered to providers in the state, we turn to information about Nebraska's population distribution, geographic dimensions, and the distribution of child care throughout the state.

3.1. Where are Nebraska's children and early childhood care providers located?

Population Distribution

Nebraska is the 16th largest state in the U.S., covering over 77,000 square miles. Travel time between Nebraska's borders, driving from Omaha at the state's eastern border to Scottsbluff near the western border (450 miles) takes about seven hours. Going north to south, from Ainsworth to McCook (200 miles), takes about four hours to drive.

2015 Census estimates show 55% of Nebraska's 1.89 million residents (1,032,000) live in the Lincoln and Omaha metro areas. Forty-five percent (858,000) reside outside of Douglas, Sarpy, and Lancaster Counties. To further delineate Nebraska's population distribution, Figure 3.1 provides a view of the county populations with points locating the major metropolitan and micropolitan cities and small towns. For this report, city and town populations are as follows. Cities with a total population of:

- 50,001 and above = Metropolitan area
  Counties with metropolitan populations include Douglas, Lancaster, and Sarpy.
- 10,001 to 50,000 = Micropolitan area
- 0 to 10,000 = Small Town/Remote area

FIGURE 3.1 | ESTIMATED POPULATION FOR NEBRASKA COUNTIES: METRO & MICRO CITIES AND SMALL TOWNS MARKED

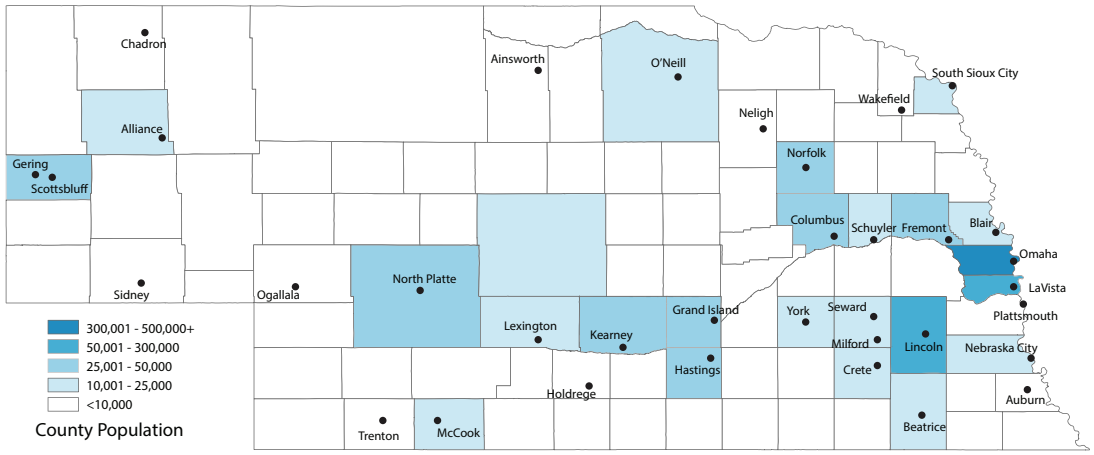


TABLE 3.1 | DISTRIBUTION OF NEBRASKA'S POPULATION BY CITY AND TOWN SIZE

Population	Classification	Cities and Towns
50,001 +	Metropolitan 2 metro areas	Omaha Metro Area & Lincoln Metro Area (includes all cities and towns in Douglas, Lancaster, and Sarpy Counties; 55% of the population of Nebraska)
10,001 – 50,000	Micropolitan 11 cities	Grand Island, Kearney, Fremont, Hastings, North Platte, Norfolk, Columbus, Scottsbluff, South Sioux City, Beatrice, Lexington
5,001 – 10,000	Small Town 11 towns	Gering, Alliance, Blair, York, McCook, Nebraska City, Seward, Crete, Sidney, Schuyler, Plattsmouth
0 – 5,000	Remote	Remaining towns in Nebraska

The above table (Table 3.1) lists the definition and names of metropolitan areas (2) micropolitan cities (11), small towns (11), and the population of remote towns and areas in Nebraska. It is worth noting that 31.7% of Nebraska's residents live in towns with 10,000 or less residents ("Small Town" and "Remote" classifications). Also, on the above map, these cities and towns are marked. Towns where an ESU is located are also marked as well (i.e., Trenton). These cities and towns provide the basic infrastructure for ECPD delivery in Nebraska. The population is scattered throughout the state, with the majority of the population base in the eastern and southeastern part of the state.

The Location of Nebraska's Children and Early Childhood Providers

Obtained from the 2014 Voices for Children data, 153,280 children ages 0 – 5 live in Nebraska. For the same year, the U.S. Census Bureau reported 64,127 Nebraska children ages 0 – 5 reside in homes with limited resources (42% of child population, this age).

Nebraska's young children are supported by a number of child care providers who receive funding through the state and federal government, private entities, or are for-profit providers. Table 3.2 presents the different child care options in Nebraska and the number of children they are able to serve (termed "capacity").

Child care services for this age group include public and private home-based services, child care centers, preschools, federal early childhood programs and district-established services. Nebraska has 3,007 licensed child care providers not established by a school district, of which 2,167 are family home-care (I and II), 669 are child care centers and 171 are preschools. Also, of Nebraska's 245 public school districts and 17 ESUs, 188 districts have established various types of PreKindergarten services for 17,835 children ages 0 to 5. As well, a total of 36 Head Start/Early Head Start programs (22 grantees) in the state serve a total of 6,009 children from resource-constrained homes (2013-14 data). In total, the state has the capacity to serve 113,770 children, given the 2014-2016 data on child care services and capacities.

TABLE 3.2 | NUMBER OF CHILDREN SERVED, OR WHO CAN BE SERVED, BY EARLY CHILDHOOD CARE PROVIDERS IN NEBRASKA

Early childhood care providers in Nebraska	# of districts or licenses	Capacity
School districts or ESUs Early childhood centers and preschools	188 Districts/ESUs[a]	17,835[b]
Early Development Network, Sixpence		2,677[b]
Head Start and Early Head Start	22 grantees[b]	6,009[b]
Non-public school districts EC centers and preschools		3,378[b]
Licensed home-based providers, centers and preschools not associated with a school district or ESU	3,007[c]	83,871[c]
Total number of children ages 0 – 5 potentially served (combination of actual and capacity)		113,770

a Source: Nebraska Department of Education – Approved EC Programs 2013-2014.
b Source: Voices for Children 2015 Report. Data are from 2013-2014 school year.
c Source: Nebraska Department of Education, 2016 Early Childhood Licensing Report - Capacity Count per county.
c Note: Data reflect capacity counts.

Focus: Licensed Child Care Providers Not Established by a District or ESU

Birth to PreK programs that are established by school districts or are state/federally funded have the advantage of using the pre-existing, accessible, and organized frameworks to operate and manage educational services. This includes the organization and delivery of ECPD. Early childhood providers not established by the state/federal government or by the local school district are not as connected to PD opportunities and do not have as much funding to support PD for themselves or their staff. Yet, almost 74% of the available child care in the state is licensed care that is not established or associated with a public or private school district or a state/federal program. This section of the report, and the next, will focus on the systems of PD delivery for licensed providers who are not associated with a school district or ESU.

Nebraska currently has 3,007 licensed, non-district providers, who have the capacity to provide services to 83,000+ young children. The existing ECPD systems supporting these 3,007 licensed providers will be discussed in the next section. First, a more nuanced view of the location and capacity of these providers will furnish important thinking points for later recommendations.

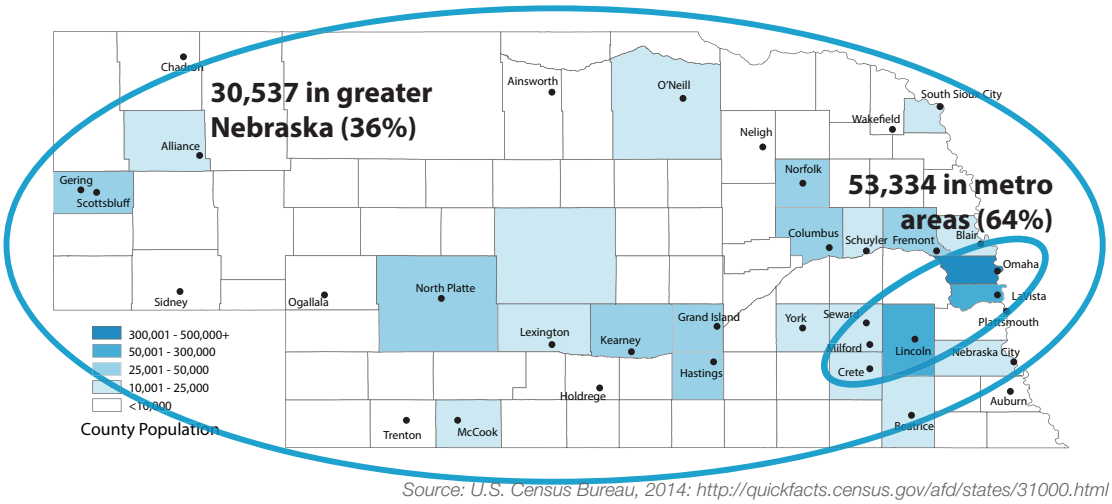
A report of the currently licensed child care providers (2016, Family-Home I & II, Child Care Centers, and Preschools) was obtained from the Nebraska Department of Health and Human Services. The following tables and figures are based on this report. Looking at Table 3.3 and Figure 3.2, the total capacity of children able to be served by providers not associated with a district or state/federal program is 83,871 throughout the state. Of that capacity, about 64% is in the metro areas, while about 36% is in greater Nebraska.

TABLE 3.3 | NUMBER OF CHILDREN ABLE TO BE SERVED BY LICENSED PROVIDERS NOT ESTABLISHED BY A SCHOOL DISTRICT OR ESU, IN NEBRASKA

Type of license	Total # of children	Child capacity in counties with a metropolitan city	Child capacity in counties with a micropolitan city	Child capacity in counties with only small towns & remote towns
Home-Based I	15,165	6,986	3,766	4,413
Home-Based II	7,390	2,948	1,733	2,709
Child Care Center	56,934	41,180	9,550	6,204
Preschool	4,382	2,220	942	1,220
Total # of Children	83,871	53,334	15,991	14,546
		63.6%	19%	17.3%

Source: Nebraska Department of Education, 2016 Early Childhood Licensing Report - Capacity Count per county. Note: Data reflect capacity counts, not the actual number of children served.

FIGURE 3.2 | EARLY CHILDHOOD CARE IN NEBRASKA: STATEWIDE CAPACITY AND LOCATION



Source: U.S. Census Bureau, 2014: http://quickfacts.census.gov/afd/states/31000.html

STATEWIDE CAPACITY FOR 83,871 CHILDREN

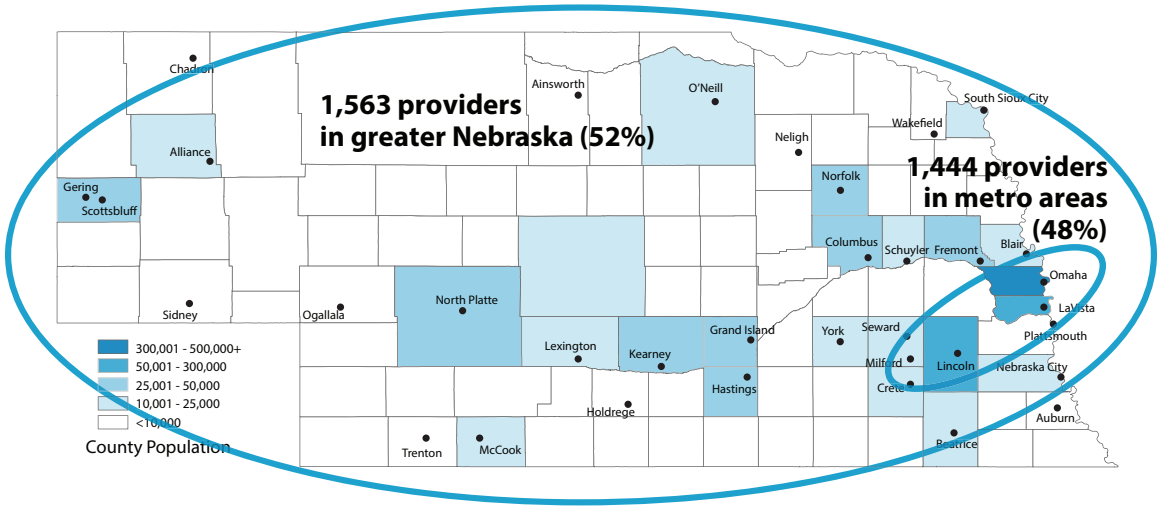
There are 3,007 licensed providers (not associated with a district or state/federal program) in Nebraska. Table 3.4 shows the number of providers in each license type as well as their distribution throughout the metropolitan, micropolitan, and small town/ rural counties in the state. Figure 3.3 shows the distribution of these 3,007 providers throughout the state. Fifty-two percent (52%) of the providers are in greater Nebraska, while 48% are located within the two metropolitan areas.

TABLE 3.4 | EARLY CHILDHOOD PROVIDERS IN NEBRASKA LOCATED IN METRO & MICRO CITIES AND SMALL & REMOTE TOWNS

Type of license (not established by a school district)	Total # of licenses	Number of licenses in counties with a metropolitan city	Number of licenses in counties with a micropolitan city	Number of licenses in counties with only small towns & remote towns
Home-Based I	1,537	715	379	443
Home-Based II	630	256	142	232
Child Care Center	669	418	130	121
Preschool	171	55	40	76
Total licenses	3,007	1,444	691	872
		48%	23%	29%

Source: Nebraska Department of Education, 2016 Early Childhood Licensing Report - Capacity Count per county

FIGURE 3.3 | LICENSED EARLY CHILDHOOD PROVIDERS THROUGHOUT THE STATE



Source: U.S. Census Bureau, 2014: http://quickfacts.census.gov/afd/states/31000.html

POINTS OF CONTACT 3,007 LICENSED PROVIDERS

Thinking of the licensed early childhood provider network in terms of "points of contact" can bring perspective to the size of the customer base that a statewide PD system needs to serve. A licensed provider or entity (center or preschool) can be considered a point of contact in an ECPD system. There are 3,007 licensed child care providers in Nebraska, distributed about equally between the metro areas of Omaha/Lincoln and the rest of Nebraska (greater Nebraska). Thus, about 1,500 points of contact are located within less than a 30-minute drive from Lincoln or Omaha, and about 1,500 points of contact are dispersed throughout greater Nebraska. Looking at the Nebraska map again, you can get a sense of the distribution and location of those 1,500 points of contact in greater Nebraska based on the county and city populations.

The 1,444 providers in the metro area have the capacity to serve 53,334 children, while the 1,563 providers in greater Nebraska have the capacity to serve 30,537 children. The larger capacity in the metro areas is due to the higher number of licensed child care centers in the metro cities. Although the total number of all license types is roughly split between metro and greater Nebraska, 62% of the child care center licenses are located in the metro areas. Also, almost 80% of the greater Nebraska licensed providers are Home I and II providers and these greater Nebraska home care providers (1,200) serve approximately 40% of the children living in greater Nebraska (12,621 children).

This approach of determining provider location, child capacity, and points of contact offers programs delivering PD and other early childhood services a rough metric on how

to allocate time and resources, taking into consideration time and distance needed to travel to various providers, and conversely, the distance providers need to travel to the PD offering. It is a natural fit for technology to be attractive for programs and providers in the rural areas.

The greater Nebraska licensed home-based providers, child care centers, and preschools described in this section acquire their needed professional development primarily through the Nebraska Department of Education's ELC coordinators, area ESUs, and regional county extension educators (discussed in the next section). Interviews with the professional development coordinators who work with child care providers in greater Nebraska revealed that these rural providers, especially the home-based providers, are not connected through a formal early childhood network, often work alone and for long hours, are often located in remote areas, can experience isolation, and are not as well-informed as the metropolitan providers in regard to current licensing requirements, training opportunities, and available grants or funding. However, the PD coordinators also reported that the rural providers, again especially home-based providers, want more training opportunities and typically are motivated to attend professional development if it is in a nearby town and is free or inexpensive. They have expressed interest in online due to the time and cost it takes to drive to a training location, to attend face-to-face training, especially if the training is on a weekday.

TOPIC 4: DESCRIBE NEBRASKA'S EARLY CHILDHOOD PROFESSIONAL DEVELOPMENT STRUCTURE AND REQUIREMENTS (BIRTH – PREK), AND HOW TECHNOLOGY IS SUPPORTING THE DELIVERY OF PD.

Before we look at how technology is being used to deliver ECPD in Nebraska, we will review the PD requirements for early childhood providers in Nebraska (Licensing, Step Up to Quality, Rule 11, and state initiatives) and the delivery mechanisms in place that offer these trainings.

4.1. What are the training and PD requirements for Nebraska early childhood providers?

Early Childhood Training and Ongoing Professional Development in Nebraska

Because of the wide evidence base documenting the importance of high-quality early child care, Nebraska has implemented a number of licensing and teacher qualification requirements, as well as a QRIS system, to ensure the provision of high-quality services for its young children.

Licensing

Nebraska offers five Birth – PreKindergarten child care licensing options for programs not associated with a district or ESU. The license type is based on the number of

children being served at one location and ages of the children. The licensing options include:

- Home-Based I: Home-based care for four to eight children with one provider
- Home-Based II: Home or other site-based care for up to 12 children with two providers
- Child Care Center: Site-based care for 13 children or more
- Preschool: Program providing educational services where children do not nap and are not fed a meal

For each license type, training is required in a number of areas to obtain and maintain licensing, and must be completed within a certain time frame. Here are the overall training hours required for each license type, with the hours that are offered online (or will be soon):

- Owners of home-based care (I & II): 70 hours for licensing, of which 44 are online
- Directors of child care centers, and preschool programs: 95 hours for licensing, of which 44 are online
- Teachers and assistants at child care centers, and preschool programs: 46 hours for licensing, of which 44 are online

Also, all early childhood professionals are required to participate in 12 hours of ongoing PD per year. Some of the licensing courses can be counted toward the annual requirement.

QRIS: Step Up to Quality

Also pertaining to professional development, Nebraska implemented a QRIS starting in 2013, called Step Up to Quality (STEP). Participation in STEP is voluntary for smaller providers and required for programs that receive over $250,000/year in state subsidies. In the STEP program, providers progress through five levels of quality, starting with Step 1, which requires registration with the state's Early Childhood Professional Record System. Step 2 requires the completion of all licensing requirements and a couple of other training courses, progressing through Steps 3 – 5, which include optional coaching, required ECERS or CLASS observations, focus on quality standards such as child outcomes, program administration and family engagement, as well as progression though higher education for the teachers. See Table 4.1 for a listing of the required courses for licensing and STEP.

TABLE 4.1 | REQUIRED COURSES FOR LICENSING AND STEP

Required PD training for licensing and STEP	Number of hours	Delivery method
LICENSING		
All - Family, Center and PreK care		
Nebraska Early Learning Guidelines (ELGs) 7 modules (6 hours per module)	42	Currently face-to-face; Online option coming in summer 2017
Safe With You	4	Face-to-face (F2F)
CPR and first aid	4	F2F
Family-based care only		
Getting Down to Business	20	F2F
Center and PreK care only		
Management training	45	F2F
Annual PD – Required hours	12	
STEP		
Step 2		
Licensing courses must be completed (above)	70 - 95	
NAP SAC	6	F2F
Orientation to STEP program	20 min	Online
Introduction to ECERS	4	Online and F2F
Introduction to CLASS	4	Online and F2F
Annual PD – Required hours	24	
Steps 3 - 5		
Coaching optional		Can utilize technology
Focus on quality standards – Program curriculum, learning environments and interactions, child outcomes, professional development and ongoing training (includes formal education), Family Engagement and Partnerships, and Program Administration	varying	Some training might be online, but none was identified.
Annual PD – Required hours	24	

Courses offered online are in bold.

It is worthy to note that the Nebraska Early Learning Guidelines (NE ELGs), which are currently offered face-to-face will also be offered online in the summer of 2017 (estimated). Providers will be able to choose to do the training online or face-to-face. The NE ELGs include seven PD sessions (six hours per session, for a total of 42 clock hours). Each session focuses on an area of child development and learning (social and

emotional development, approaches to learning, healthy and physical development, language and literacy development, mathematics, science, and creative arts). The face-to-face training for the NE ELGs is offered through the Early Learning Connections – Coordinators (see below for description of Early Learning Connections).

State Initiatives

Nebraska also has focus areas and state initiatives that require additional PD, which can be counted toward the 12 clock hours of annual, required PD. Currently, the state is focusing on social-emotional development of children ages 0 – 5, using the evidence-based Pyramid Model. Professional development for the Pyramid Model includes a summer training workshop and regular in-person coaching sessions over a period of two years. See the Nebraska Early Childhood Pyramid Model 2014-2015 Evaluation Report from the Nebraska Department of Education for outcome results. Districts are not required to implement the Pyramid Model, but many in Nebraska are choosing it.

Rule 11 – Certification, Credentialing, and Required College Credits

Nebraska recently passed legislation (Rule 11) requiring family providers, child care centers, and preschools established by a school district or an ESU to have or obtain college credits and/or credentialing, depending on professional level, i.e., program directors, lead teachers, and assistant/para teachers. Rule 11 applies only to programs that are established by a district or an ESU, such as family-based care or private child care centers and preschools. Credit hours can also be obtained by completing CEUs approved by the Nebraska Department of Education. For instance, if an assistant teacher completes 45 clock hours in PD, an equivalency of three college credit hours can be obtained.

FIGURE 4.2 | NEBRASKA'S EARLY CHILDHOOD TRAINING AND PROFESSIONAL DEVELOPMENT REQUIREMENTS

	Licensing Requirements	Step Up to Quality Completion of Step 2	Step Up to Quality Steps 3-5	Rule 11
Annual Hours (applies to all)	12 hours	24 hours	24 hours	
Family Providers	42 online hours 38 F2F hours	42 online hours 38 F2F hours	10+ hours Higher Ed	
Family Teacher			Higher Ed	
Center Directors	42 online hours 53 F2F hours	42 online hours 53 F2F hours	10+ hours Higher Ed	
Center Teachers	42 online hours 4 F2F hours	42 online hours 4 F2F hours	Higher Ed	
Center Paras	42 online hours 4 F2F hours	42 online hours 4 F2F hours	Higher Ed	
School Directors			Higher Ed	Higher Ed
School Teachers			Higher Ed	Higher Ed
School Paras			Higher Ed	Higher Ed
HV Specialists				Higher Ed

4.2. What delivery systems are used to provide PD to Nebraska early childhood providers?

Nebraska's Early Childhood PD System – Delivery of PD

There are several access points for in-service early childhood providers to acquire face-to-face or tech-supported PD in Nebraska. The primary avenues include:

- Early Learning Connection system - NDE
- Early Childhood Training Center - NDE
- Educational Service Units (ESUs)
- The Early Development Network (EDN) – NDE
- University of Nebraska Extension Service (UNL Extension)
- University of Nebraska's Online Worldwide for higher education

Each of these entities, and the PD they provide, are described below. Please see Figure 4.3 for a map of the above ECPD providers.

Early Learning Connection

One of the primary ECPD delivery systems for the state of Nebraska is the NDE's Early Learning Connection (ELC). ELC is a coordinated regional system of state and local partners facilitated through the NDE Early Childhood Training Center (ECTC). ELC

coordinators (one in each of the seven regions) work with local partners to provide leadership and resources to support PD for early childhood and school-age caregivers/ teachers in home, center, and school-based programs. The ELC coordinators are supervised by their local ESU and typically have an office in the ESU as well.

The coordinators annually or semi-annually survey the local providers and programs to determine the PD services and training needed and then match resources to those needs. Each region's coordinator builds strong relationships with the providers in the region, as well as the local partners (school districts, Head Start, state and local contract trainers, entities supporting early childhood, local early childhood associations, etc.).

Programs and services include:

- PD and training for early childhood and school-aged children, including required training for licensing, STEP, and state initiatives
- Localized planning and delivery of PD training and programs for the region, based on the regional needs
- Support for utilizing early childhood coaches
- Annual or semi-annual regional conference
- Program quality assessments
- Strategic planning with higher education and other adult learning
- Community engagement and outreach

The ELC coordinators and local partners also work to increase the use of technology to facilitate collaboration and professional development.

Early Learning Connection and its partnerships are supported by:

- Federal grants
- NDE Office of Early Childhood
- NDE Office of Special Education
- Nebraska Head Start Collaboration Office
- Local Educational Service Units (ESUs)
- University of Nebraska Extension

The Early Childhood Training Center

The NDE Early Childhood Training Center (ECTC), housed at ESU 3 in La Vista, offers providers an array of professional development programs and series, through Early Learning Connection.

The ECTC also provides certified and expert trainers to deliver various specialized training series. Some of the programs that are available through the ECTC include courses that are required for licensing (Early Childhood Management Training, Safe With You, Early Learning Guidelines) and STEP (Environment Rating Scales Training CLASS) as well as other topics such as early literacy and language, and active curriculum/assessment training. The center also provides training for early childhood coaching, child care health consults, and home visitors. Also, the center will develop tailored training to meet the needs of a particular audience.

Since August 2014, the ECTC has administered and managed the course training approval and tracking process. All early childhood professionals who need training to satisfy child care licensing requirements, annual in-service training, and participation or advancement in STEP, first request approval of the training course(s) from the ECTC. Early childhood professionals requesting approval fill out a Google form and send or email it to the ECTC for approval. This process will eventually be merged into the state's Early Childhood Professional Record System. This record system manages the professional records for those employed by early childhood programs, such as where a teacher currently is employed and what training that teacher has completed.

Educational Service Units

The state's 17 ESUs are a statewide educational support system of professional learning and service delivery, organized to lead the coordination of shared resources, training, and services for elementary and secondary schools. Although the ESU focus is on elementary and secondary grades, the mission of the ESU overlaps with the goals of Nebraska's ECPD effort and the possibility of extended technology use in ECPD, thus it is included in this section. The Nebraska ESUs are charged with the mission of supporting school improvement efforts of Nebraska's school districts and providing professional development for school district personnel, primarily in the areas of resources, pedagogy, and technologies in order to improve student learning. Areas of priority and core services include:

- Coordination of professional development, especially related to improving the achievement of students in poverty and students with diverse backgrounds
- Access, training, and use of technology, including distance learning
- Development of statewide partnerships and support of statewide goals and initiatives
- Provision of leadership, training, and innovation

The Nebraska ESUs are known to be innovative hubs for high-tech access, knowledge, and training. For instance, each ESU is equipped with state-of-the-art distance education equipment for use by all school districts within the ESU's service area, and

provides support and training to utilize the distance learning technology. The ESUs also provide support and training to help integrate all types of technology into a district, and to meet specific technology needs of districts such as promotion of tech-literacy and citizenship as it relates to the school improvement process.

The ESU offices are home to many of the state's ECPD system providers, such as the ELC coordinators, the University of Nebraska Early Childhood Extension educators, and the Nebraska Early Development Planning Region Teams.

Activities of the 17 ESUs are coordinated by the Educational Service Unit Coordinating Council (ESUCC). According to Section 79-1246 of the Nebraska Revised State Statutes, the ESUCC shall work toward statewide coordination to provide the most cost-effective services for the students, teachers, and school districts in each educational service unit. The council's duties include, but are not limited to:

- Preparation of strategic plans to assure the cost-efficient and equitable delivery of services across the state
- Administration of statewide initiatives and provision of statewide services
- Coordination of distance education

Nebraska Early Development Network – Planning Region Teams

The Nebraska Early Development Network (EDN) is the state's system of services for children birth to age 3 with disabilities. The mission of the network is to provide leadership, technical assistance, resources, and consultative services to the staff and families, with the goal of improving outcomes through organizational development and professional learning. The network is composed of 29 early childhood Planning Region Teams (PRTs), which function as local interagency coordinating councils. Many of the PRTs have designated the local ESU as the local lead agency with which they work to coordinate training and PD for early childhood service providers and families across the region.

Nebraska Early Development Network – Technology Offerings

The network provides an online training course for home visitors and service providers working with young children with disabilities. The course offers readings and video examples, quizzes and tests, and additional resources. The eight modules in the course cover areas such as IDEA, services coordination, and recommended practices.

The network also provides a mobile app for parents and professionals to use as a guideline to track a child's development. It contains developmental milestones for children from birth through age 3, as well as additional resources and information for families.

University of Nebraska Extension

There are 14-16 early childhood Extension educators located throughout the state who develop and deliver research-based educational programs, training, and resources to parents, teachers, and early childhood providers in their geographic area. The outcomes of these focused educational programs include creating environments and experiences for children birth – age 5 that result in improved school readiness and enhanced social-emotional growth and development. The early childhood Extension educators engage with local stakeholders to determine needs and provide access to educational opportunities and partner with research faculty at the university to engage in action research while designing, delivering, and evaluating early childhood programs.

Extension Early Childhood Education Online – The Learning Child

Nebraska Extension offers high-quality online professional development modules covering a range of early childhood educational topics. Each topic area provides research-based information and strategies on how to support the early growth and development of young children. The two-hour modules include reading, video lectures and examples, quizzes, and follow-up activities. Ten modules in the areas of social-emotional development, health and nutrition, and instructional approaches are available online now, with four more coming soon. These online modules are on the state's list of approved PD courses and can be completed for CEUs.

Online Worldwide

Online Worldwide is a collaborative initiative across the University of Nebraska system to pull together the online programs and offerings by the four campuses and the University of Nebraska High School into one central location. Most University of Nebraska Online Worldwide degree and certificate programs are offered completely online, with no requirement to attend classes on campus. A few graduate-level programs require a short residency, or require one weekend day each month on campus, and a few programs require a face-to-face orientation. The same instructors who teach on the University of Nebraska campuses teach the online courses. The instructor develops the curriculum, conducts the class, gives assignments, answers questions, leads discussions, and assigns grades. Students are expected to begin the first week of class and work regularly throughout the semester. Online courses are often highly interactive with faculty and students communicating through email, discussion forums, and chat groups.

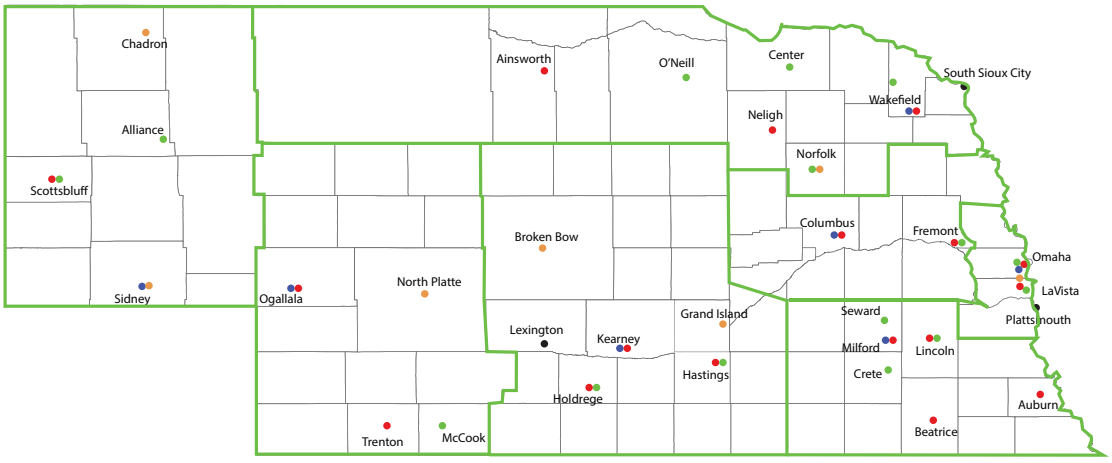
See Table 4.2 for Online Worldwide's courses for early childhood degrees, certifications, and endorsements.

TABLE 4.2 | EARLY CHILDHOOD DEGREES FROM ONLINE WORLDWIDE

Online Worldwide – University of Nebraska Early Childhood Degrees		
Bachelor's and Certifications		
Child, Youth and Family Studies, Specialization in Early Childhood Education in a Mobile Society	Bachelor's	UNL
Early Childhood and Family Advocacy	Bachelor's	UNK
Early Childhood Inclusive	Bachelor's	UNK
Early Childhood Inclusive, Initial Certificate	Initial Certificate	UNK
Master's and Graduate Endorsements/Certifications		
Early Childhood Inclusive, Graduate Endorsement	Graduate Endorsement	UNK
Special Education, Early Childhood Special Education, Graduate Certificate	Graduate Certificate	UNL
Special Education, Early Intervention Specialist (Birth – K)	Graduate Endorsement	UNL
Curriculum and Instruction, Concentration in Early Childhood Education	Master's	UNK
Special Education, Specialization in Early Childhood Special Education	Master's	UNL
Special Education, Specialization in Early Childhood Special Education	Master's	UNL

FIGURE 4.3 | SYSTEMS OF ECPD DELIVERY IN NEBRASKA

Below are the geographic locations of Nebraska's ECPD delivery teams (67 – 69 points of delivery). The green lines are the ELC regional boundaries. Most of the ELC coordinators, Extension educators and EDN regional planners are housed in the regional ESU.



4.3. How are Nebraska ECPD trainers and early childhood providers using technology for PD?

Technology-Supported ECPD in Nebraska – What Is Currently Used

Interviews were conducted to gather information regarding how technology is currently used to deliver ECPD, ideas on how technology could be better leveraged, and obstacles encountered when using tech-supported ECPD. Interviewees included Early Learning Connection coordinators, administrators in ESUs, University Extension educators, NDE – Office of Early Childhood Education, the Early Childhood Training Center, Step Up to Quality, Nebraska Children and Families Foundation, Sixpence, and the Buffett Early Childhood Institute. Please see Table 4.3 for an overview of what types of tech-supported ECPD are currently used in Nebraska.

Overall, technology-supported ECPD was not reported to be widely used by ECPD trainers or administrators who were interviewed. The most common use of technology was for administrative purposes, such as video meetings/conferences among program participants who were at various locations throughout the state. Also, use of document management systems, such as Google Docs, was a common theme. There was some use of video conferencing for trainings between state program administrators and early childhood providers, such as Sixpence.

The most frequent reference of using tech-supported PD was for online modules for CEU credit, specifically the “First Connections” program offered by the NDE’s Office of Early Childhood. Other online CEU programs used include the Better Kid Care modules from the Penn State University Extension and The Learning Child modules from the University of Nebraska–Lincoln Extension. Nebraska’s DHHS home visitors are also utilizing the online home visiting training modules (Answers4Families). NDE will also be offering the Nebraska Early Learning Guidelines (ELGs) online starting in summer 2017. The Nebraska ELGs (42 clock hours) are required for licensing and Step Up to Quality. The face-to-face ELGs training will also continue to be offered.

Also of note, the Nebraska Early Childhood Collaborative organization offers a website for early childhood professionals in Nebraska: www.nebraskaexchange.org. This is a free membership website where family providers and child care centers can access back-office services (e.g., payroll, human resources, and fiscal management), program services (e.g., coaching, professional development), marketing services, and curriculum offerings. The organization uses a shared-services model to save both money and time for its members. The professional development section of the website offers Nebraska-specific information and links to the appropriate state websites.

TABLE 4.3 | MOST COMMON TECHNOLOGY AND TECH-SUPPORTED PD USED IN NEBRASKA EARLY CHILDHOOD ORGANIZATIONS

Type of Tech-Supported ECPD	Name	Who
Administrative Tech Use, Supporting ECPD		
Video conferencing	Zoom Google Hangout	Most programs and administrators who were interviewed
Enterprise document management	Google Docs	ECTC, most programs
Learning management systems	Canvas, Blackboard, Moodle	NDE
Training and PD Using Technology Supports		
Distance learning/training (Trainer at one site being broadcast to several other sites. Live interaction.)		
	ESU Distance Learning (4 – 8 sites can connect using ESU equipment)	Some ELC regions
	Zoom (up to 8-12 individuals can connect using Network Nebraska)	Some ELC regions
Online modules for licensing, STEP requirements, Rule 11		
	Early Learning Guidelines	Licensing requirement
	STEP orientation	STEP requirement
	Intro to ECERS and CLASS	STEP requirement
	Project Para	Para educators for Rule 11
Online modules for program training		
	Answers4You (EDN)	Home visiting training
Online modules for CEUs		
	First Connections (NDE) Ages B-3	Recommended by ECTC, ELCs
	Better Kid Care (Penn State Extension)	Recommended by ECTC, ELCs
	The Learning Child modules (UNL Extension)	Recommended by ECTC, ELCs, Extension educators
Training and PD Using Technology Supports		
Video		
	Video – Self-reflection	Sixpence (some use)
	Video – Coaching	A lot of interest (see below)
	Video Exemplars	---
Online communities of practice		
	Formal online communities of practice	---
	Informal online communities of practice - social networks	Some ELC regions Some with Pyramid Model
Webinars		Some ELC coordinators

4.4. How do Nebraska early childhood trainers envision technology being used in the future?

Expansion of programs serving birth – age 5 providers statewide is requiring these programs to consider how technology can be used more widely. For instance, the Sixpence program has tripled in reach (currently 34 grantees throughout the state), but the PD budget has not expanded at the same rate. Anticipating the need for PD instructors to drive to various locations will become time- and cost-prohibitive, Sixpence administrators are now strategizing on how the instructors can use technology for meetings and trainings.

Other growing programs include Step Up to Quality (the state QRIS program) and the statewide initiative of the Pyramid Model. The extensive use of coaching in these programs introduces the same obstacles of cost, distance, and time. These programs could initiate technology use in both the training of the upcoming new cadre of coaches, as well as utilize technology in the coaching process to contain costs. This positions video conferencing to become a more common practice as these programs expand to more locations throughout the state.

Rural providers needing face-to-face training for licensing requirements may face future obstacles, as explained by an ELC coordinator from western Nebraska. The required training for licensing is partially supported by state funding. However, the trainings are also supported by registration fees paid by the providers. As fewer providers need the mandatory trainings, the procurement of registration fees will drop and classes will be offered less frequently due to cost, posing a problem for the providers that need to finish the courses. Online offerings of mandatory licensing courses could help to reach providers who need the training and are not able to travel a great distance to attend an available session.

According to another ELC coordinator, there is a diverse array of provider experiences and exposure to information. Quite a bit of time and resources are spent teaching baseline information, which then limits the ability for trainers and providers to engage in collaborative interactions that promote learning at deeper levels. This coordinator saw the value of offering online courses that establish baseline knowledge so more time could be spent in interactive learning, as well as offering signature services that meet local needs.

The use of technology to train coaches also was an insight mentioned by several interviewees. Nebraska is implementing coaching in many of its programs (STEP, Sixpence, Pyramid Model, and others). A member of the Coaching Development Team developing a Nebraska coaching model is piloting a coach training strategy where

coaches meet together in groups of six to eight once a month to discuss coaching. Prior to the meeting, coaches videotape themselves conducting a coaching session. At the meeting, one coach shares his or her video with the group and a facilitator leads the group in discussing the video in terms of coaching practices. The first three meetings are in person and then they meet via video conference. This tech-supported model could show promise for future coach training programs. Other ideas for coach training include utilizing YouTube for posting coaching videos, in a closed group, as well as organizing video communities around these videos for peer feedback and discussion.

In the literature review, many of the cited articles examined the use of video in professional development: video exemplars and the use of teacher-recorded video for self-reflection and coaching feedback. Neither of these types of tech-supported PD is being used much by PD instructors in Nebraska. However, many of the interviewees expressed interest in including video in PD offerings, especially in coaching feedback.

There are several innovative projects being piloted by ELC coordinators, state programs, and extension educators. One ELC in western Nebraska is piloting a para educator training model. This ELC coordinator recognized that para educators are not included in the school PD programs, so she created once-a-month training for paras. The model includes paras recording themselves in the classroom and sharing it for peer-to-peer coaching. The paras receive training on coaching facilitation and meet once a month for discussion. The meetings alternate between in-person meetings and meetings using Zoom (video conferencing software).

Regarding the use of social media and online communities, several trainers and programs are considering setting up closed Facebook pages for online communities of practice or idea sharing among providers. The sense of social isolation among home providers can be discernable and understandable, given the long hours required for running a home child care service. Informal use of social media to create and garner support is a natural option, especially for younger home care providers. Also, a program specialist commented that many teachers, especially in rural communities, do not have a peer grade-level teacher with whom to share experiences and ideas, and that technology could be used to connect these teachers to one another. Ogallala has a large group of family providers that communicate via Facebook during the day, offering support. One provider calls it her “lifeline.” Also, one extension educator in Nebraska has organized an online learning circle where five to eight care providers connect on Zoom for education and to discuss self-recorded videos of their practices. The professional development eLearning specialists in ESU 8 are in their third year of creating “Wednesday Webinars.” Every Wednesday a half-hour YouTube video is posted

on a private YouTube channel showing teachers how to integrate technology into their content curriculum. Many PD providers see the power of this medium and want to utilize it in their PD programs but don't have the technical know-how to set up a social network or need a model to follow.

Several interviewees expressed the need for an integrated, state website for ECPD resources and training. Providers could use this site to determine what their training needs are and make contact with the coordinators and trainers in their area who are providing the training. Online registration would be integrated with the professional record system for early childhood providers (NDE), and providers could also take online courses through this site. This site would also be used by coordinators and trainers to communicate their offerings and also for their own training and PD.

4.5. What barriers and obstacles are encountered when using tech-supported ECPD in Nebraska?

The interviewees consistently expressed great interest in wanting and needing to utilize technology more in PD delivery and PD access. However, they encountered several barriers or obstacles in moving forward to integrating more technology. The barriers pertain to technical skills, access and bandwidth, cost, sustainability, and systems.

Technical Skills

As cited by an ELC coordinator, there is a wide variation of technical knowledge and skill level among early childhood providers and teachers, as well as ECPD instructors. Many have embraced digital technology and are very comfortable with using the internet but may need extra training to use other digital tools such as virtual conferencing, simple video editing tools, and uploading and downloading video footage, and using videos online. PD instructors and facilitators also are in need of training on virtual conferencing software, as well as using the distance learning equipment found in all ESUs and the majority of school districts in Nebraska. The idea of having access to a tech-support person when technical challenges occurred was mentioned several times. There were several comments indicating that training on these digital tools would empower the PD providers, as well as the early childhood teachers and practitioners, to use them more frequently.

Access and Bandwidth

Program administrators commented that their instructors or home visitors in rural locations have difficulty accessing the internet. Creative solutions are being tried to alleviate this issue, such as providing the home visitors with portable hot spots – WiFi. Issues of technical difficulties while using virtual conferencing also were cited, which most likely is a bandwidth issues (too many people using the virtual conferencing

software at once). Some interviewees commented that some school districts' Internet access is undependable and/or very slow when sending large files. ELC coordinators also commented that home providers are less likely to have internet access, and if they do, the only device they use to access the internet is their smartphone, which would not provide a good user experience for virtual conferencing or online learning. Some interviewees were cautious about the possibility of uploading and downloading large video files (i.e., teacher-recorded video for coaching feedback) because of the slow speed and amount of purchased data (especially for home users) needed to transport the video files.

Cost

Many interviewees expressed interest in using the various types of tech-supported PD (online modules, video exemplars, video in coaching and self-reflection) but were also concerned with the possible associated costs for providers and practitioners. Providers do want to access more training, and online would be a very convenient way to do this, but registration costs for the online courses, video exemplar libraries, etc., prohibit providers from doing so. Costs for online ECPD can range from $5 per module to over $250 for a course. Also, equipment and software (and training) needed for the video use (e.g., cameras, tripods, and video editing) posed a perceived cost. Smartphones can be used for video recording and free online editing software is available, but training would be needed to utilize these tools for use in video recording.

Sustainability

For the online training modules that are available now through the NDE (First Connections and soon-to-be-available Nebraska Early Learning Guidelines), there are costs involved in sustaining these online options. Managing the access and providing user support, updating the content every three to four years, and maintaining the hardware and software systems that deliver the content all require human capital and maintenance costs, which is often not sufficiently covered in the budget planning for these offerings.

General Technology Systems

The low use of technology by ECPD providers and early childhood practitioners in Nebraska is also due to a lack of systematic tech infrastructure dedicated to ECPD. For example, providers have much interest in taking online courses (especially rural providers) but have expressed confusion as to what courses to take, what is approved by the state of Nebraska, and how to access the courses. As will be discussed in the recommendations section, a more systematic approach to integrating technology into current Nebraska ECPD delivery and provision of easy-to-navigate structures would expand the use of technology by early childhood practitioners and instructors.

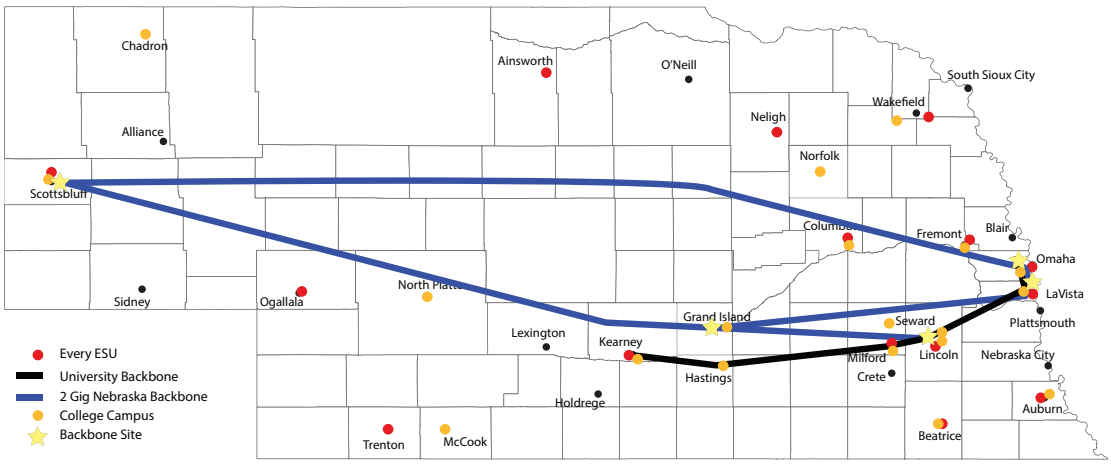
TOPIC 5: DESCRIBE NEBRASKA'S BROADBAND INFRASTRUCTURE FOR EDUCATION AND HOME ACCESS.

5.1. What is Network Nebraska?

Network Nebraska can be thought of as Nebraska's dedicated high-speed educational IT network. Specifically, it is a collaborative, statewide high-speed broadband telecommunications network built in the last 10 years, used to share telecommunications resources, network services, and applications among Nebraska's state agencies, local governments and, as reviewed in this report, educational entities. Network Nebraska currently connects all public school districts (K-12); all University of Nebraska campuses; and all state, community, and tribal colleges, as well as other educational entities in Nebraska (300+ WAN circuits connecting to a 1,293-mile 2Gbps-10Gbps backbone carrying upwards of 71Gbps of internet). See Figure 5.1.

Among its many provided services, Network Nebraska is the primary transport mechanism for web-based and video distance education, and rich media content distribution for educational entities across the state. (For a more detailed map of Network Nebraska, please see Figure 5.2 on page 71.)

FIGURE 5.1 | MAP OF NETWORK NEBRASKA INFRASTRUCTURE



Members of the Network Nebraska consortium include over 291 entities:

- 100% of K-12 public school districts
- 100% of Educational Service Units
- 100% of the University of Nebraska
- 100% of state colleges
- 100% of community and tribal colleges
- 50% of private higher education
- 20% of private K-12 schools
- 2% of public libraries

Educational entities join Network Nebraska to lower their costs of transporting internet data and to improve the quality, reliability, and speed of their telecommunications services. Nebraska K-20 education entities enjoy one of the lowest unit costs for commodity internet in the entire country because the consortium aggregates the state's internet demand and then purchases from two statewide master contracts. Because of the consortium leverage, commodity internet costs for Nebraska educational entities have dropped from $87/month per Mbps in 2006 to $6.10/month in 2010 to 79 cents/month currently. In addition, the Legislature introduced a new telecommunications allowance within the state aid formula that allows any high-need school district to be compensated for 85% of the post E-rate costs and Network Nebraska fees. The consortium's bidding and brokering also includes working with every middle-mile and last-mile telecommunications company in Nebraska to connect educational entities to the statewide backbone.

As a result, a school in a remote, rural area may experience the same or similar telecommunications speed and bandwidth as a school in a larger city like Omaha, at a very low cost.

Network Nebraska is made possible through a statewide consortium of 291 voluntary members (education entities) who work together to improve their telecommunications services and lower costs, resulting in a completely self-funded network. Consortium membership requires: 1) commitment to establish a Wide Area Network (WAN) fiber or Ethernet connection to a Network Nebraska aggregation point, and 2) annual participation fees and transport fees of internet data. In return, the consortium provides members with access to reliable, high-quality statewide high-speed internet bandwidth, network and equipment management, aggregated procurement services, E-rate filing, and technical support.

The network was created in 2006 through Legislative Bill 1208 and is managed by the State of Nebraska Office of the Chief Information Officer (CIO), in partnership with the

University of Nebraska, with guidance from the Network Nebraska Advisory Group, Collaborative Aggregation Partnership, and the Nebraska Information Technology Commission (NITC). The 17 regional ESUs were instrumental in building local school district consensus and participation, without which the creation of Network Nebraska would not have been possible. Please see below for a more detailed history of Network Nebraska's creation.

Additional education services and benefits include:

- Statewide clearinghouse and video conferencing scheduling software (www.nvis.esucc.org)
- High-quality exchange of Nebraska K-12 and college video distance learning classes
- State contract pricing for Zoom video conferencing connectivity/transport
- Intranet ethernet connectivity to all 291 Network Nebraska participants and Nebraska DOE
- Virtual museum trips from across the U.S./world

History of Network Nebraska

Prior to Network Nebraska (1992-2006), video distance education was provided by 12 separate consortia of school districts and ESUs that were isolated technologically from each other, with no interconnecting network. With vision and leadership from Senator Ron Raikes, Legislative Bill 1208 was passed, which laid the framework for the statewide distance education network now called Network Nebraska.

LB 1208 embodied many of the recommendations for the state's distance education improvement plan. The distance education plan, crafted by the Legislature's education committee, was centered on three general principles:

1. To recognize the responsibility of school districts, ESUs, and public post-secondary education institutions to make decisions related to participation in distance education
2. To encourage and incentivize the exchange of distance education courses using a statewide network, known as Network Nebraska
3. To provide for statewide coordination through a new entity, ESU Coordinating Council

Upon passage of the bill, the state chief information officer (CIO) set out to create and manage a statewide network to be called Network Nebraska. The bill also incentivized educational entities to join the network by rewarding them with lottery funding for equipment reimbursement and financial credits for creating and using distance learning course exchanges.

The section of Legislative Bill 1208 (Neb. Rev. Stat. 86-5,100), pertaining to Network Nebraska, reads as follows:

The Chief Information Officer, in partnership with the University of Nebraska, shall develop and maintain a statewide, multipurpose, high-capacity, scalable telecommunications network to be called Network Nebraska. The network shall consist of contractual arrangements with providers to meet the demand of state agencies, local governments, and educational entities as defined in section 79-1201.01. The Chief Information Officer shall provide access to each school district, each educational service unit, each community college, each state college, and the University of Nebraska at the earliest feasible date and no later than July 1, 2012.

Educational entities as defined in the law's section 79-1201.01 is as follows:

"Educational entity" means a school district, a private, denominational, or parochial school, an educational service unit, a community college, a state college, the University of Nebraska, or a nonprofit private postsecondary educational institution.

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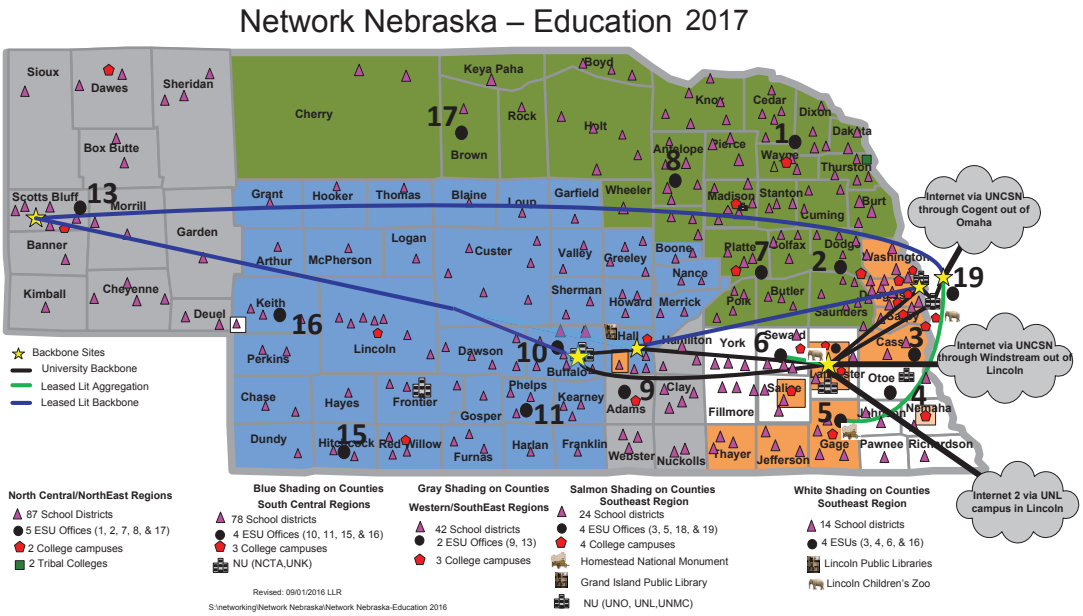
Websites
http://www.networknebraska.net (Network Nebraska)
http://www.nitc.ne.gov/ (Nebraska Information Technology Commission)

FIGURE 5.2 | MAP OF NETWORK NEBRASKA



5.2. What is the infrastructure for broadband access for homes in Nebraska?

Nebraska commissions and organizations have been active in bringing broadband services to residents. The Nebraska Public Service Commission led an effort to increase broadband adoption and utilization throughout the state from 2010 – 2105, called the Nebraska Broadband Initiative. The initiative is part of a larger national effort to facilitate the integration of broadband and information technology into state and local economies.

The initiative focused on mapping current broadband access in the state, planning, capacity building, technical assistance, and regional planning. Goals of the initiative included:

Increased Household Adoption of Broadband

- Over 90% of households statewide will subscribe to broadband by 2020.
- 85% of households in rural Nebraska will subscribe to broadband by 2020.

Increased Broadband Availability

- Enhance the capacity of local communities to address broadband development.
- Support the use of broadband technologies in businesses, agriculture, education, and health services.
- Support the development of libraries as community anchor institutions.
- Increase digital literacy and broadband access to the internet.

Other goals are focused on investment, workforce development, and economic development.

Nebraska's broadband vision is that every resident, business, government entity, community partner, and visitor has access to affordable broadband service and the necessary skills to effectively utilize broadband technologies, if they choose.

The impact reports from various activities included in the initiative can be found at the Nebraska Broadband Initiative website: http://broadband.nebraska.gov/.

The following maps show the various types of broadband coverage currently available (2016) throughout the state. Figure 5.3 shows the available coverage for broadband delivered via cable modem (television cable), fiber, fixed wireless (tower to tower, radio waves), and DSL. Figure 5.4 shows the available coverage for broadband delivered via mobile wireless. Most of the state has broadband access via different platforms offered by the numerous telecommunications companies.

FIGURE 5.3 | BROADBAND COVERAGE IN NEBRASKA

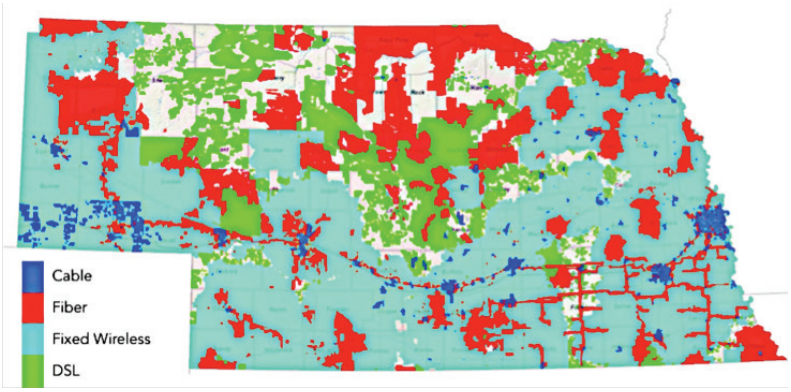


FIGURE 5.4 | BROADBAND COVERAGE IN NEBRASKA

Surveys on Broadband Access in Nebraska

The Nebraska Public Service Commission, in collaboration with the Nebraska Information Technology Commission (NITC) Community Council, the AIM Institute, the University of Nebraska–Lincoln, and Nebraska Department of Economic Development (DED), conducted a study of broadband use and needs in Nebraska in 2014. A total of 2,798 Nebraska residents answered questions about their current use of technology, their opinions about community technology resources, and technology training needs.

The survey results showed 86% of Nebraska residents have internet access at home. In 2014, state residents accessed the internet via:

- Cable modem: 43%
- DSL phone line: 19%
- Wireless mobile: 15%
- Fixed wireless: 10%
- Fiber to home: 4%
- Satellite: 4%
- Dial-up modem: 1.5%
- Don't know: 3%

Age was also a determining factor as to whether a household had internet. Here is the breakdown of home internet access within age categories:

- Ages 19 – 39: 95%
- Ages 40 – 64: 87%
- Ages 65+: 64%

Geographic location also differed in home internet access:

- Lincoln: 90%
- Omaha: 87%
- Rural areas: (ranging from 73% to 86%, average of 82%)

For households in the lower income categories, 53% have broadband access at home. Barriers to having broadband at home included that it was too expensive (48%) and that there was not a computer in the house (56%). For households with no internet access, 32% used libraries and schools for free public access.

Seventy-seven percent (77%) of all respondents agreed that having free public internet access in the community was important. A large majority believed broadband access was important for distance learning access (78%) and telemedicine services (75%). Thirty-seven percent (37%) of the respondents had used Skype and 30% had taken an online course.

The respondents also expressed a need for technology training. When asked if they would like to take a basic training class on various technology topics, responses for "yes" were as follows: on how to use the internet (31%), social media (30%), and email use (24%). The residents in the Panhandle were most interested in taking a basic technology course (43%), and Hispanics (45%) expressed more interest in a basic course than non-Hispanic residents (29%).

Rural Residents

Similar findings were identified in a 2016 report on "Broadband and Mobile Internet Services in Nonmetropolitan Nebraska" from the University of Nebraska–Lincoln and the university's Institute for Agriculture and Natural Resources. Metropolitan counties not included in the sample were Cass, Douglas, Lancaster, Sarpy, Saunders, Seward, and Washington. Rural respondents (N = 1,746) reported:

- High-speed internet service at home, 82%
- Cell phone data plan only, 6%
- No home internet service or cell phone data plan, 9%
- Dial-up internet only, 2%

Interestingly, 70% of rural Nebraskans access the internet using their cell phones. It wasn't stated directly that this was the preferred access device, as opposed to a home computer.

Persons living in or near the largest communities are more likely than persons living in or near the smallest communities to report satisfaction with the speed of their mobile internet service. Approximately two-thirds (67%) of persons living in or near communities with populations of 10,000 or more are satisfied with the speed of their mobile internet service, compared with 43 percent of persons living in or near communities with fewer than 500 people.

Most rural Nebraskans see value in having high-speed internet access for various items. Over 70% of rural Nebraskans think high-speed internet access is important or very important for the following items: searching for/applying for jobs, educating children, and learning new things.

Moving Forward

Legislative Bill 538 in 2016 designated the Legislature's Transportation and Telecommunications Committee to conduct a study of Nebraska's telecommunication services, including the following:

1. The existing structure of regulations governing telecommunication services within Nebraska
2. The need to update and revise provisions of Nebraska law governing the regulation of telecommunication service providers
3. The role and operation of federal and state subsidy mechanisms created to support voice-grade and broadband telecommunication services
4. The availability and quality of broadband telecommunication services in Nebraska
5. The need to enact incentives to supplement existing support mechanisms and encourage investment in broadband telecommunication infrastructure in Nebraska

Hearings on this legislative bill are underway. The author did not investigate whether education entities were involved in the hearings. However, it may be beneficial for early childhood representatives to attend to gain awareness of the focus points of the study, to communicate with K-12 and higher education representatives on matters such as E-rates and funding mechanisms for educational broadband access, and to contribute to discussions shaping the study.

Models of Rural Technology for Statewide Services

One model of rural technology implementation for statewide services in Nebraska is the statewide health information exchange. The Nebraska Health Information Initiative (NeHII) is one of the largest health information exchanges (HIEs) in the country with data on over 3 million individuals and over 5,000 users throughout the state. In October 2015, the Nebraska Information Technology Commission (NITC) received over $2.7 million from the U.S. Department of Health and Human Services Office of the National Coordinator for Health Information Technology to support greater adoption of the exchange and to help health care facilities in Nebraska integrate health information technology into their workflow. The NITC is partnering with the NeHII and the University of Nebraska Medical Center (UNMC) on this grant.

Conclusions and Recommendations

Nebraska faces a growing need to provide training and formal education to large numbers of early care and education practitioners throughout the state. This need is prompted by efforts to improve/maintain quality practices and increase capacity in the state's public and private child care services. However, budgetary resources for ECPD and training have not grown at the same rate as the need, or have remained static, requiring the state to stretch limited resources across a growing number of family child care providers, child care centers, and preschool entities. This constraint especially affects the professional development of practitioners in geographically isolated regions who are increasingly more difficult to reach because of the travel costs involved in face-to-face training. The potential of tech-supported ECPD to offer high-quality training opportunities and flexibly meet professional development needs is propelling it forward as a possible, effective ECPD option.

This report presents an initial analysis of Nebraska's current ECPD requirements and delivery systems, how the state currently uses technology to deliver ECPD, and how the state could leverage technology to maximize the flexibility and accessibility of resources while maintaining quality and managing costs. The following recommendations are based on research of effective tech-supported PD programs, as well as needs analyses extracted from interviews with state and regional administrators of early childhood programs, ECPD instructors, and various community organizations involved in the delivery of PD to the state's early childhood practitioners. The recommendations are organized into two categories: short-term recommendations and a longer-term recommendation for a feasibility study of a statewide, tech-based ECPD system.

The general overarching goals for an ECPD system are to improve and maintain the quality of early child care services, build capacity, retain highly qualified early childhood professionals, promote early childhood professionals' health and well-being, and build expertise in all facets of ECPD (administrative, instructor, and practitioner) while offering clear, desirable, and attainable career paths in the profession. Technology can assist in accomplishing these goals. It can provide infrastructure for ECPD administration, serve as a delivery mechanism (e.g., online courses), and offer useful tools (e.g., virtual conferencing and video).

The state's use of technology for ECPD is nascent. A handful of online courses are currently offered, with the Early Learning Guidelines (required for licensing) going online in the summer of 2017. The early childhood professional record system has begun to register teachers participating in the STEP program. Innovative PD coordinators are

developing their own pilot programs that leverage technology (e.g., video in coaching, coaching via virtual conference, learning circles via virtual conference, some informal social media groups, video for coach training, etc.). Administrative uses of virtual conferencing and Google Docs by program administrators are readily increasing.

However, Nebraska's use of technology in ECPD overall is scattered and sporadic, with PD administrators and coordinators independently bringing tech into their practice and programs. Barriers to greater adoption include varied levels of tech literacy and tech savvy for all early childhood professionals including program administrators, PD instructors, providers, and teachers. Also, some PD instructors have encountered problems using virtual conferencing and broadband access in schools and in homes and did not have tech support to help them with the challenges.

Providers have expressed confusion as to what online content is available for them and what content is accepted by the NDE training center, coupled with the concern about course registration fees. These barriers are not unusual, especially as technology increasingly becomes inherent in systems operations. However, to reduce these hindrances, systematic short-term solutions that address the barriers are needed, which also dovetail with a cohesive, long-term technology infrastructure plan.

Promising indicators of positive adoption of tech-supported ECPD were frequently encountered during the data collection for this report. Stakeholders in ECPD (administrators, PD programs, early childhood providers, community organizations) were all supportive of systematically incorporating technology into the ECPD delivery system. Much interest was expressed in using technology to deliver content online—especially by rural program coordinators and providers—as well as video recording as part of the coaching model. There is untapped energy and creativity around the prospect of including all forms of technology in PD. Additionally, there is a strong willingness to learn how to use technology tools. Broadband access is available to every school district, but the awareness of its access may not be. Home broadband access is also available across Nebraska, and a study has been commissioned to evaluate how households and businesses can affordably connect to the broadband providers. Furthermore, 34% of home providers and center teachers and 47% of teachers in district programs have already accessed training online—a good indicator of future interest (Roberts, Iruka, & Sarver, 2017).

SHORT-TERM RECOMMENDATIONS

1. **Increase tech-literacy training for all early childhood professionals, including program administrators, professional development instructors, and early childhood care providers.** PD instructors across the state noted that basic tech literacy was varied. Many PD instructors expressed support for using technology tools and online modules for early childhood training but recommended tech literacy training for themselves and the providers with whom they work. Training would range from very basic use of technology (delivered face-to-face for 5-9% of their providers) to mid-level training on tools such as Zoom, Google Docs, social media, YouTube, cloud storage, video editing/uploading/downloading, learning management systems, and distance education technology. Advanced courses would go deeper into all of these tools. Training for instructors, facilitators, and providers would be needed. Also, it is recommended that advanced tech training be included during pre-service instruction to help future teachers become comfortable with using tools that will become mainstream as they advance in their careers.

2. **Provide access to technology support.** Partnerships between school districts and local professional development coordinators (Early Learning Connection coordinators and University of Nebraska Extension educators) for tech assistance may be one solution. One barrier to technology adoption is the lack of tech support when PD instructors or providers encounter technical difficulties. When instructors and providers are not successful using technology and no assistance is available the technology is not used again. Many schools that have a 1-to-1 ratio of devices to students also have an in-school or in-district tech integration person or team that provides immediate or timely technology help. Partnerships between local PD coordinators (i.e., ELC coordinators, Extension educators, etc.) and local school districts for tech assistance may be a solution for obtaining technical support. In addition, ESUs have highly skilled technical teams that assist schools in all technical matters and could be a resource for training. Some state programs also contract with outside sources for their tech support services. Although local support is preferred, a stopgap solution could be a tech support hotline.

3. **Increase use of distance learning and virtual conferencing.** In distance learning, an instructor in one location conducts the training while being broadcast in high definition to four to eight distance learning classrooms across the state. The training is live, in real time, with the ability for anyone at any site to interact with the instructor. Often, training facilitators are present at the sites to assist in the instruction. This is a very effective method when face-to-face training is needed. Every school district in the state and all ESUs have at least one room dedicated to distance learning, complete with all of the equipment that is needed. One reason this method has

not been utilized is trainers' lack of knowledge about how to use distance learning equipment. The ESU technical teams are well versed in how to use the equipment and may be willing to assist ECPD instructors and trainers (see ESU recommendation below). Virtual conferencing is the same concept, except instead of broadcasting to a classroom, virtual conferencing broadcasts to individual computers. Using Zoom software and the high-speed internet provided at school districts through Network Nebraska, the connection and broadcast quality is very high and very reliable, with a maximum of eight to 12 endpoints. Virtual conferencing can be used for training, coaching sessions, and peer-to-peer coaching.

4. **Develop partnerships with the state's Educational Service Units.** The 17 regional ESUs are charged with the mission of supporting K-12 school improvement efforts of Nebraska's school districts. Two of the three mandated core services the ESUs offer are professional development for school district personnel and technology training, access and infrastructure organization and administration. Legislation focuses the ESUs' efforts on grades K-12. However, many of the regional ELC coordinators, extension educators, and Nebraska Early Development Network regional planners are housed at the local ESUs. Partnering with ESUs for tech-related ECPD seems a natural fit, but considerations of legislative parameters of K-12, as well as funding for services, would need to be addressed. Nebraska's current Commissioner of Education, Matt Blomstedt, was the executive director of the ESU Coordinating Council before he became commissioner. While the ESUCC executive director, Blomstedt led the charge in establishing Nebraska's BlendEd eLearning Initiative, and he is a proponent of technology in schools.

5. **Use video in coaching model and coach training.** Converging research is showing that using video in coaching sessions to provide individualized feedback promotes positive change in teachers' practices. The coaching model is being applied in several programs in Nebraska including the STEP program, the Pyramid Model implementation, and Sixpence. Much interest was expressed by program administrators and coaches regarding the use of video in coaching. Some of the concerns regarding the use of video were technical in nature: video editing, uploading, downloading—all of which can be taught in a short training session. Video feedback software (e.g., Torsh TALENT) that offers easy-to-use tools for editing, feedback documentation, and storage and organization of video files can be used to manage coaching activities and document teachers' progress.

   Also, all three of the ECPD programs mentioned above have grown in-service capacity and will need to have a cadre of highly trained coaches either on staff or on contract, and statewide coach training will be needed. A pilot of video use in

coach training is currently underway in the Pyramid Model implementation. Other interviewees that used video for coach training reported that the coaches valued the experience highly and said it was effective.

6. **Encourage the use of the Nebraska Early Learning Guidelines online modules in a blended format.** Online use of modules created by the NDE has been very successful (i.e., First Connections modules). The Nebraska Early Learning Guidelines (ELG) online modules will be available mid-2017. The Nebraska ELGs is a 42-hour training course focused on the guiding principles that support children's learning and development. The course is required for licensing and comprises 44% – 60% of the required licensing coursework, depending on whether the participant is a family provider or a center director, and 91% of the required licensing coursework for teachers and paraprofessionals.

   Statewide ELC coordinators currently teach this essential course in a series of seven – 14 face-to-face training sessions. If delivered in a blended format, the provider participants could be required to complete the coursework online prior to the live training session(s). The participants would come to the training session with a baseline of knowledge already established, enabling the ELC trainers to present more instructive, interactive, participant-led exercises in which providers and teachers can practice the strategies taught online and receive collaborative feedback. We know from research that converting conceptual knowledge into practice and feedback results in a deeper, more permanent learning experience, which has been shown to improve teacher outcomes.

7. **Pursue pilot projects.** Empirical research is just starting to examine tech-supported ECPD. Because of the immediate needs to train providers and teachers, small-scale innovative tech-supported PD programs can be tested in the field, with an evaluation component included. Several accounts of innovative tech-supported PD pilot programs in Nebraska emerged during interviews conducted for this report, ranging from video coaching for paraprofessionals using virtual conferencing in the Panhandle to tech training for providers in the northeast, to peer-to-peer video feedback during virtual learning circles in the east central to video feedback during coach training in the east. Other trainers across the state would find the information from these pilot studies valuable. Creating supports such as a web space where PD instructors could document their tech-supported PD projects and findings, answer questions, and post relevant information would be a valuable contribution to the state's collective knowledge of ECPD. Grants supporting these pilot studies could also help to add more formalized methods of research with the assistance of university researchers.

8. **Establish a comprehensive early childhood professional development website.** An easy-to-navigate, attractive, comprehensive website where providers, teachers, PD trainers, program administrators, and coaches can access pertinent PD information would be a strong addition to Nebraska's current ECPD system. The website might include a "roadmap" through licensing requirements, the STEP QRIS, and Rules 11 and 51, as well as online and in-person PD opportunities, training registration and transcripts, and other vital ECPD information. Currently, most of this information is available online. However, it is embedded in various websites, which can cause confusion. A small number of states provide well-designed "all-inclusive" ECPD websites that convey professionalism and organization to the users (see Table 1.3 for website links). It is recommended to involve providers, teachers, and trainers in the website design process to capture their needs and points of view.

9. **Leverage Network Nebraska's broadband access and the state's efforts for home access.** Network Nebraska's high-speed broadband internet access throughout Nebraska, extensive reach into schools, and consortium benefits need to be further explored. The network's capacity is available for use by all educational entities in Nebraska. The state defines an educational entity as K-16. Extending that definition to Birth-16 could open additional possibilities for internet access and consortium benefits for early childhood professionals, at least in school districts in Nebraska, and potentially other programs.

   State legislation (LB 538) in 2016 designated the Transportation and Telecommunications Committee of the Legislature to conduct a study of Nebraska's telecommunication services. Hearings on this legislative resolution are underway. It may be beneficial for early childhood representatives to attend these hearings to understand the focus of the study, to communicate with K-12 and higher education representatives on matters such as E-rates and funding mechanisms for educational broadband access, and to contribute to discussions shaping the study.

LONG-TERM RECOMMENDATION

Conduct a feasibility study of a technology-based ECPD system. Current efforts to improve the quality of child care in Nebraska and grow its workforce could be bolstered by systematically integrating technology in the administration, management, and delivery of the state's ECPD. A technology-based ECPD system would recognize and consolidate the needs of various stakeholders involved in administration, training, licensing, certification, and ongoing professional development (i.e., state agencies, state programs, public and private education and child care entities and their workforce, institutions of higher education, service organizations, and others who are committed

to the professional development of the early childhood workforce). By harnessing the power of technology, this ECPD platform could extend efficiencies in all aspects of professional development, management, and access.

If this approach is desirable, it is recommended that a feasibility study of the creation and implementation of a technology-based ECPD system be considered. Approaching a feasibility study from a systems perspective would address, in detail, the scalability, effectiveness, accessibility, and sustainability of a proposed ECPD system.

Scalability

Scalability of a tech-based PD system would include analysis of how the system would accommodate growth (e.g., more providers, teachers, trainers) while maintaining the quality of services delivered by the trainers and the providers/teachers in the PD system and managing costs. Systems that invest in flexible models of access, delivery, and administration in respect to time and location will better meet the growing needs of the early childhood professional workforce.

Effectiveness

Two aspects of effectiveness are involved in a technology-based ECPD system: the effectiveness of the tech-supported PD delivered (are teachers and children benefiting?) and the impact of the tech-based system (does the system meet the benchmarks established?). Embedding research into scaled PD program models to analyze outcomes, as well as developing benchmark assessments, would need to be included in the system's framework.

Accessibility

Determining how to provide reliable, convenient access to an ECPD system for everyone will need to be explored.

Sustainability

Sometimes overlooked and understudied, sustainability planning for a tech-based system is crucial to its success. Underfunded sustainability plans can degrade services provided by the system, resulting in unwanted difficulties and expenses. Aspects of sustainability for an ECPD tech-based system would include (but not be limited to): ongoing systems design and maintenance, content creation and updating, user training, equipment and software upgrades and replacement, systems analyses, and varied levels of tech support.

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