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An Exploration of Online Professional Development Systems Supporting the Competencies of Infant and Toddler Teachers and Caregivers: Key Findings and Next Steps for Learning

In 2017, the Office of Planning, Research, and Evaluation in the Administration for Children and Families funded Mathematica to conduct the Infant and Toddler Teacher and Caregiver Competencies (ITTCC) project. The project aims to examine existing efforts across states, institutions of higher education, professional organizations, and early care and education programs related to competencies for infant and toddler teachers and caregivers who work in group settings and build a conceptual foundation to inform future measurement, research, and evaluation. The findings described in this brief are based on an exploration of online competency-based professional development (PD) systems that include infant and toddler teachers and caregivers as an audience. Definitions for key terms (competency, competency framework, competency-based professional development, proficiency levels) as used in this project can be found on page 13.

This brief is accompanied by a series of profiles of the PD systems selected for the exploration. The profiles include citations for all of the information reviewed to develop both the profiles and this brief. This brief includes citations for specific examples referenced in this brief.

To support the quality of care for infants and toddlers, states, national organizations, and institutions of higher education have made efforts to outline specific competencies (that is, knowledge, skills, and attributes) that are essential to the practice of teaching and caring for infants and toddlers and that are needed to promote their optimal development. Competency-based professional development (PD) for teachers and caregivers is readily available through a number of online systems.

The Infant and Toddler Teacher and Caregiver Competencies (ITTCC) project conducted an exploration to give the child care and early education (CCEE) field a snapshot of how select virtual, competency-based PD systems are implemented; how teacher and caregiver knowledge, skills, and attributes are assessed in these systems; and whether the systems have or are building an evidence base.[1] Box 1 describes the approach to this exploration including how we selected systems for inclusion, how we gathered information on the systems, and the range of information gathered. We summarize several characteristics of the systems in Tables 1 and 2.

Box 1. Approach for the PD system exploration

Selecting systems for inclusion

In this brief, we summarize the characteristics of five online PD systems that were included in the exploration. To identify online PD systems, we conducted an Internet search and asked for nominations from experts in the infant-toddler CCEE field. We identified 23 systems in our search for a wide variety of systems, narrowed the pool identified to 12 for further exploration, and selected 5 systems for in-depth review using the following criteria:

- **Required characteristics of the PD systems selected:**
  - Relevant to competency-based learning for teachers and caregivers of infants and toddlers
  - Aligned with or based on a competency framework or an observational measure of competencies
  - Currently in use or in active development

- **Preferred characteristic of the PD systems selected:** Indication an evidence base exists or an evidence base is being developed

- **Desired potential areas of variation across the PD systems:**
  - Funding source(s)
  - Approach to supporting competencies

Using these criteria, we selected the following systems for inclusion:
- CDA with CLASS®
- Children's Learning Institute (CLI) Engage
- Maine Roads to Quality Professional Development Network (MRTQ PDN)
- Virtual Lab School (VLS)
- We Grow Together (WGT)

Documenting characteristics of the PD systems

We created profiles of each of the five systems selected by gathering information from publicly available online sources (including, but not limited to the websites hosting the PD system). We documented the following information:

- **Background information**, including developer of the system, funder, source, year developed, cost to use, availability in languages other than English, intended audience, and audience focus

- **How the system is used**, including alignment with a competency framework and/or observational assessment; areas of focus; approach to PD; approach to developing the PD system; approach to assessment of the competencies; components of the system for different proficiency levels; academic credits, certifications, or PD hours; incentives; and additional materials or resources

- **The research behind the system**, including how research or evidence informs or informed the development of the PD system, and research on the PD system

We also asked representatives of each of the systems to review their respective profiles for accuracy and to provide any other information they wanted to share. We updated each of the profiles based on the representatives' suggested edits and any other relevant additional information provided.

Table 1. General characteristics of selected PD systems

System name	Developer	Funder	Cost per course	Host platforms and access	System available in language other than English
CDA with CLASS®	Teachstone	Independent effort by Teachstone	$215 – $1,299	Restricted to users who have paid for the course	No
CLI Engage	Children's Learning Institute at the University of Texas Health Science Center at Houston in partnership with the Texas Education Agency and Texas Workforce Commission	Texas Education Agency; Texas Workforce Commission; various philanthropic organizations	$0 – $175	Users in any state must first create an account, and then enroll in courses from an online catalog; some components of system only available to early childhood professionals in Texas	Yes, in Spanish for select courses and materials
Maine Roads to Quality Professional Development Network (MRTQ PDN)	State of Maine Office of Child and Family Services, Department of Health and Human Services	State of Maine Office of Child and Family Services, Department of Health and Human Services; private funders	$0 – $30	Users in any state must first create an account and then enroll in courses from an online catalog; some courses require payment; some components of system only available to early childhood professionals in Texas	No[a]
Virtual Lab School (VLS)	Ohio State University	U.S. Department of Defense, Office of the Secretary of Defense; U.S. Department of Agriculture, National Institute of Food and Agriculture	No cost to use	User account not necessary; some components of system only available to military-affiliated professionals who create an account to access those components	No
We Grow Together (WGT)	Mathematica	Office of Planning, Research, and Evaluation in the Administration for Children and Families, U.S. Department of Health and Human Services	Not yet available for broad use	Not yet available	No

CDA® = Child Development Associate®; CLASS = Classroom Assessment Scoring System; Children's Learning Institute = CLI.

[a]The developer is in the process of translating materials into languages other than English. As of August 2022, the developer translates materials on an individual basis if needed.

Table 2. Brief descriptions of the selected PD systems

System name	Intended audience	Specificity of system to infant/toddler teachers and caregivers	Frameworks or observational measures that the system is aligned with or informed by[a]	Approach to assessing the competencies in the online system[a]	Tailoring of content to FCC providers
CDA with CLASS®	Infant, toddler, and preschool teachers and caregivers; family child care providers	The CDA with CLASS® course for those earning a CDA® for the first time includes content relevant for infants, toddlers, and preschoolers. The CDA Renewal with CLASS® has a separate course for those working with infants and toddlers.	CDA®[b]; CLASS measure	Competencies are assessed through a variety of activities including module quizzes and graded multiple-choice assessments.	CDA with CLASS® does not have content specific to FCC providers, but the content is aligned to requirements for the CDA® for FCC providers.
CLI Engage	Early childhood professionals serving children from birth to age 6	Some courses are specifically designed for those working with infants and toddlers.	CIRCLE Infant-Toddler Teacher Competencies; Texas Core Competencies for Early Childhood Practitioners and Administrators	Competencies are assessed through knowledge checks before and after the course and a summative multiple-choice post-test at the end of each module.	There is a free 20 session online PD program for FCC providers—Beginning Education: Early Childcare at Home (BEECH)—that is consistent with the CIRCLE Infant-Toddler Teacher Competencies.
Maine Roads to Quality Professional Development Network (MRTQ PDN)	In-service teachers and caregivers, administrators, family educators, and support professionals who provide early care and education services in child care, Head Start and Early Head Start, public pre-k, early intervention, or home visiting programs	The system offers courses for those specifically in the process of obtaining the infant and toddler credential, and some courses are specifically designed for those working with infants and toddlers.	CDA®[b]; Maine Infant Toddler Credential	Competencies are assessed through knowledge checks before and after the course and a summative multiple-choice post-test at the end of each module.	There is a course specifically designed for FCC providers, but the content of the course is not aligned with a competency framework. The course focuses on how to open a business in the home, such as how to comply with state certification procedures.

System name	Intended audience	Specificity of system to infant/toddler teachers and caregivers	Frameworks or observational measures that the system is aligned with or informed by[a]	Approach to assessing the competencies in the online system[a]	Tailoring of content to FCC providers
Virtual Lab School (VLS)	Military-affiliated professionals and early childhood professionals, including caregivers of infants and toddlers, preschool-age children, and school-age children; family child care providers; training and curriculum specialists; and those in management	There is a specific track for those working with infants and toddlers.	CDA®[b]	Competencies are assessed through a non-graded short multiple-choice self-assessment on the content.	VLS offers courses that are designed specifically for professionals in different positions, one of which is designed for teachers and caregivers working in FCC settings.
We Grow Together (WGT)	In-service teachers and caregivers of infants and toddlers	This system is specifically designed for those working with infants and toddlers.	QCIT measure; CDA®[b]; CUPID; ZERO TO THREE Critical Competencies for Infant-Toddler Educators	Competencies are assessed through caregiver self-assessment checklists and self-reflection activity questions. Competencies can also be assessed by an independent observer using the QCIT.	WGT is designed for use in center-based classrooms and FCC settings; as such, WGT activities are applicable to FCC settings and are sometimes included in the examples (e.g., videos of child care settings).

[a] For the competency frameworks included in this column, the online PD systems could have been developed to align with that framework or to have content informed by the framework, or the alignment could have been assessed and documented after the online PD system was developed.

[b] The professional education hours earned through these systems align with infant-toddler, preschool, and/or family child care competencies outlined by the CDA®. Users interested in earning a CDA® Credential™ must follow the requirements to submit an application with the Council for Professional Recognition. This includes an additional fee separate from any fees (if relevant) associated with using the online PD system.
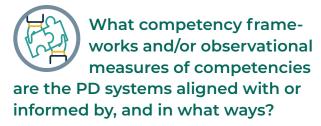
CDA® = Child Development Associate®; CLASS = Classroom Assessment Scoring System; CLI = Children's Learning Institute; CUPID = Collaborative for Understanding the Pedagogy of Infant/Toddler Development; FCC = family child care; HSPPS = Head Start Program Performance Standards; QCIT = Quality of Caregiver-Child Interactions for Infants and Toddlers.

In what ways are the PD systems specific to teachers and caregivers of infants and toddlers?

All of the systems have a selection of courses for teachers and caregivers of various age groups, including infants and toddlers. One of the five systems reviewed (WGT) has an exclusive focus on the PD of infant and toddler teachers and caregivers.

/ WGT focuses on the PD of infant and toddler teachers and caregivers exclusively. The principles and practices are intended to promote infant and toddler social-emotional, cognitive, and language and literacy development.

/ CDA with CLASS® offers one course that covers all age groups. Within the course, there is content specific to infant, toddler, and preschool teachers and caregivers. For example, there are lessons or modules[2] in the course where users are asked to read an article on the age group they care for, or there may be content throughout the course that calls out specific age groups. The cost of the course includes the user's choice of the Infant-Toddler, Preschool, or the Family Child Care (FCC) CDA® Competency Standards[3] book. The CDA with CLASS® Renewal course has two different course options: one for infants and toddlers and one for preschool-age children.

/ CLI Engage offers a selection of infant and toddler-specific courses in its catalog, such as training informed by the CIRCLE Infant-Toddler Teacher Competencies[4] and the Infant, Toddler, and Three-Year Old Early Learning Guidelines.[5]

/ MRTQ PDN is similar to CLI Engage in that there are various courses for infant and toddler teachers and caregivers. These courses partially satisfy the requirements for obtaining the Maine Infant Toddler Credential.

/ VLS offers six courses that are designed specifically for different tracks (infant and toddler, preschool, school-age, FCC, training and curriculum specialists, management), one of which is for teachers and caregivers working with infants and toddlers.

What competency frameworks and/or observational measures of competencies are the PD systems aligned with or informed by, and in what ways?

Of the five systems in the scan, two are aligned with or informed by an observational competency assessment (CDA with CLASS®, WGT). Additionally, four of the five systems address competencies that cut across different domains of promoting the healthy development of infants and toddlers, including social-emotional, physical, and cognitive development; health and safety; family communication and engagement; program management; and professionalism (CDA with CLASS®, CLI Engage, MRTQ PDN, VLS). WGT key domains include social-emotional, language and literacy, and cognitive development.

/ CDA with CLASS® is aligned with the CDA®[6] and an observational competency assessment and its principles and practices, the Classroom Assessment Scoring System (CLASS).[7]

/ CLI Engage is aligned with multiple state-specific competency frameworks. CLI Engage includes trainings and resources aligned with the CIRCLE Infant-Toddler Teacher Competencies[8] and the Texas Core Competencies for Early Childhood Practitioners and Administrators.[9] Additional trainings and resources are aligned with competencies for teachers and caregivers of older children.

/ MRTQ PDN is aligned with the CDA® and the Maine Infant Toddler Credential.[10]

/ WGT is aligned with an observational competency assessment and its principles and practices (QCIT). There has also been an effort to crosswalk WGT with a number of frameworks, including the CDA® competencies,[11] the Collaborative for Understanding the Pedagogy of Infant/Toddler Development (CUPID) draft competencies for the infant/toddler workforce,[12] and the ZERO TO THREE Critical Competencies for Infant-Toddler Educators.[13]

/ VLS is aligned with the CDA®.

How do the PD systems support and assess competencies?

All five PD systems complement their courses with other resources to support infant and toddler teachers' and caregivers' competencies. All five systems have interactive training content that includes reading materials, videos, presentations with voiceovers, checklists, and suggested classroom activities. One system has a course option with an instructor as part of the online PD system (CDA with CLASS®). None of the courses tailor content to different proficiency levels, though one system (WGT) recommended content based on scores on a baseline observation of competencies as part of a field test.

/ CDA with CLASS® users engage with the PD in different ways depending on the course option they select (self-guided or fully facilitated). Both course options include real classroom videos for users to view on the platform and access to the CLASS® Learning Community to engage in peer-to-peer discussions. In the fully facilitated option, course instructors are available to answer questions, provide feedback, and grade assignments. Both courses offer discussion boards with other users.

/ CLI Engage offers a catalog of courses focused on different topics on its platform, each with multiple modules to complete. There is no instructor for the CLI Engage courses unless the user is affiliated with the statewide PD program.

/ MRTQ PDN's Core Knowledge Training Program is available online and an instructor facilitates the course. Narrated videos help guide users through the content. The system also offers a catalog of on-demand courses focused on different topics on its platform, each with multiple modules to complete.

/ VLS users engage with course content in a specific format. They are first introduced to the module, reading materials, and videos; then they must self-reflect; apply and implement what they have learned; and finally complete an assessment.

/ WGT users, including teachers and caregivers and PD providers, have an array of tools, including videos, handouts, and presentations with voiceovers, informed by the competencies assessed by the QCIT. Tools are organized into nine modules, designed to support the three competency domains embedded in the QCIT. The modules are further organized into key practices. Users receive additional details, such as which tools (videos, handouts, presentations) are recommended for all teachers and caregivers, and which are supplemental. WGT also offers discussion boards, although they are not a key feature of the system. In a field test of WGT, the system recommended modules to teachers and caregivers based on their baseline QCIT scores.

Four of the five systems (CDA with CLASS®, CLI Engage, MRTQ PDN, VLS) are embedded within a larger PD system. That is, the online training and courses are part of a larger system that includes other PD, integration with Quality Rating and Improvement Systems (QRIS), and/or state credentialing. For three of the five systems (CLI Engage, MRTQ PDN, VLS), early childhood professionals can enroll in the online courses, but some aspects of the broader PD offered by the developers are only available to specific groups or in specific locations. Two systems provide support from a coach as part of the larger system in which they are embedded (CLI Engage, MRTQ PDN). Two systems can be used with the support of a coach, but the systems do not directly offer that coach support (VLS, WGT).

/ CDA with CLASS® is a component of the larger CLASS system, though the CDA with CLASS® can be accessed as a standalone program within the system. The larger system includes, for example, a repository of online courses focused on the CLASS observational measure, a digital library of resources, and a one-day PD training on supporting teachers' and caregivers' understanding of CLASS concepts, and a virtual coaching program.

/ CLI Engage is embedded within Texas School Ready (TSR), a program that includes curriculum, classroom resources, child progress monitoring,

teacher/staff PD with one-on-one coaching, and ongoing program evaluation. TSR is available to early childhood professionals located in the state of Texas. In addition, the Texas Infant Toddler Specialist Network (ITSN) uses the online courses aligned with the competency framework to guide discussions during interactive Professional Learning Communities (PLCs).

/ MRTQ PDN is embedded within a larger PD network in Maine. The network provides in-person trainings, credential cohorts, communities of practice, and on-site consultations to programs located in the state. The larger PD system maintains the state's early childhood education and child care professional registry.

/ VLS's larger PD system is designed for those employed by military child and youth programs. VLS is designed to be implemented in the context of practice-based coaching. By law, military programs have a training and curriculum specialist; that individual can serve in the coach role and receive support for their role in implementing VLS.[14]

/ WGT is a stand-alone system focused on providing PD aligned with its competency framework. The developers designed WGT to be implemented in the context of a relationship with a trusted PD provider/coach.

All five systems describe their courses or modules as self-paced. Three of the systems (CDA with CLASS®, CLI Engage, MRTQ PDN) provide an approximation for the time that the modules within each course take to complete.

/ CDA with CLASS® courses range from 16 weeks (on-demand) to 24 weeks (facilitated).

/ CLI Engage courses, which comprise multiple modules, take between 9 and 30 hours to complete.

/ MRTQ PDN's Core Knowledge Training Program course takes approximately 30 hours to complete.

/ VLS does not specify the length of time for completing the courses.

/ WGT does not specify the length of time for completing the modules. However, the developers

note that the level of intensity and duration needed to learn a key practice varies with the complexity of that practice.

All five systems assess competencies, but in different ways. Some of these assessments occur before and after the course (CLI Engage, MRTQ PDN), and others assess competencies only at the end of the course (CDA with CLASS®) or the end of the module within a course (VLS). The systems aligned with the CDA® (CDA with CLASS®, MRTQ PDN, VLS) have courses that help partially satisfy the requirements for earning a CDA®. Although these systems support users in acquiring the professional education hours required to apply for a CDA®, the Council of Professional Recognition requires that teachers and caregivers take additional steps to earn the CDA® as well.

/ CDA with CLASS® assesses competencies at the end of the course with multiple-choice assessments.

/ CLI Engage users complete knowledge checks before and after the course to track the progress they have made throughout the course. The system also assesses competencies at the end of the course with multiple-choice assessments.

/ MRTQ PDN, like CLI Engage, asks users to complete knowledge checks before and after the course to track the progress they have made throughout the course. Competencies are also assessed at the end of the course with multiple-choice assessments.

/ VLS assesses competencies at the end of each module within a course with multiple-choice assessments.

/ WGT assesses competencies with caregiver self-assessment checklists and self-reflection activity questions. In a field test of WGT, a survey was administered to measure knowledge and beliefs before and after implementation. The competencies could also be assessed with an observational measure. Specifically, the QCIT could be used by an independent observer to assess caregivers' competencies given that the WGT system is aligned with this observational measure of competencies; that is, the QCIT focuses on specific behaviors that demonstrate competencies.

Three of the five systems also recommend self-reflection activities that focus on how caregivers can implement what they have learned with their own classroom practice (MRTQ PDN, VLS, WGT). These open-ended self-reflection activity questions are focused on the training or course content, or on teachers' and caregivers' own experiences in the classroom.

/ MRTQ PDN has self-reflection activity questions centered around teachers' and caregivers' own experiences in the classroom.

/ VLS, similar to MRTQ PDN, has self-reflection activity questions centered around teachers' and caregivers' own experiences in the classroom.

/ WGT has self-reflection activity questions centered around video recordings of the teachers' and caregivers' practice in the classroom.

/ CDA with CLASS® and CLI Engage did not have information on self-reflection activities in materials reviewed for the scan.

Do the PD systems include components specific to teachers and caregivers from FCC settings?

Three of the five systems are designed, or offer specific courses, for teachers and caregivers in FCC settings (CLI Engage, VLS, WGT). For one of the systems, there is a course for FCC providers (MRTQ PDN), but the content of the course is not aligned with a competency framework.

/ VLS offers courses that are designed specifically for each of its six tracks (infant and toddler, preschool, school-age, FCC, training and curriculum specialists, management), one of which is designed for teachers and caregivers working in FCC settings.

/ WGT has previously been used by infant and toddler teachers and caregivers in center-based classrooms and FCC settings in both Early Head Start and community-based settings. WGT activities were designed to be applicable to FCC settings, which are sometimes included in the examples (for example, videos of child care settings).

/ MRTQ PDN has a course specifically designed for FCC providers, but the content of the course is not aligned with a competency framework. The course focuses on how to open a business in the home, such as how to comply with state certification procedures. However, MRTQ PDN is in the process of developing a competency framework for FCC providers, credential pathways, and training content.[15]

/ CDA with CLASS® offers one course that covers all types of settings. The course does not have content specific to FCC providers, but the content is aligned to the FCC CDA® requirements. The cost of the course includes the user's choice of the Infant-Toddler, Preschool, or FCC CDA® Competency Standards book.

/ CLI Engage offers an online PD course for FCC providers called Beginning Education: Early Childcare at Home (BEECH). The course covers a broad range of topics to support FCC providers and support their knowledge in key school readiness areas, including language, literacy, cognitive, and social-emotional development.

Is there an evidence base for these PD systems?

Three (CLI Engage, VLS, WGT) of the five systems have or are building an evidence base. We did not find information about research on the CDA with CLASS® or MRTQ PDN.

/ CLI Engage developers published a study on the combination of components in the CLI Engage model, including child progress monitoring, curricula, and individualized coaching. This randomized control trial (RCT) study reported medium to large effects of participation in an online course focused on the CIRCLE Infant-Toddler Teacher Competencies[16] on measures of observed interactions with toddlers.[17,18]

/ VLS has one pre-post research study on a social-emotional learning course that was hosted on the VLS platform for teachers and caregivers of infants, toddlers, and preschool-age children.[19] The authors found that teachers showed greater

knowledge of stress, stress-reduction, and prevention strategies, and greater use of reappraising children's emotion regulation. Teachers reported that the course was useful, positively affected their work with children, and helped them make positive changes in their responsiveness to children. VLS is also in the process of conducting a pre-post design pilot of its tracks and courses in a community-based setting.[20]

/ WGT developers tested the system with pairs of infant and toddler teachers and caregivers and PD providers in a pre-post design field test; the field test took place in center-based classrooms and FCC settings in both Early Head Start and community-based settings.[21] The field test examined the characteristics of the users, the tools and supports that helped them use the responsive caregiving principles covered by WGT to improve caregiver–child interactions, and whether WGT could be used by early childhood professionals to support change in beliefs, knowledge, or practice concerning infants and toddlers. There is also research evidence on the validity of the QCIT, which is the competency assessment aligned with WGT.[22, 23]

/ CDA with CLASS® did not have information on the evidence base of its system. However, numerous research studies have been published on the validity of the CLASS observational measure; CDA with CLASS® content is informed by CLASS principles and practices.[24]

/ For MRTQ PDN, we did not find information on the evidence base of its system.

Summary

This scan of online, competency-based PD systems relevant for teachers and caregivers of infants and toddlers showed that systems can vary in a number of ways.

/ **Access.** We found that teachers and caregivers have varying levels of access to these online PD systems. Some are entirely or partially free, whereas others have costs associated with them. Three of the five systems have more resources for those specifically connected to their state

or program. Only two of the five systems we reviewed had select online courses and materials available in a language other than English. Given the cultural and linguistic diversity of the CCEE workforce, this likely has implications for which systems and resources are accessed by teachers and caregivers.

/ **Audiences.** By design, all of the systems we reviewed identify infant and toddler teachers and caregivers as audience, but the amount or type of content specific to those working with infants and toddlers varies. At one end of the spectrum, one system includes relevant examples in a course for those working with children birth to five. At the other end of the spectrum, systems are designed specifically for teachers and caregivers of infants and toddlers.

Some of the systems were also developed with specific groups of CCEE professionals in mind (those in a specific state or who are part of the military). All of these systems give CCEE professionals who are not part of that group access to online content, but they are not able to provide access to all parts of their overall PD systems. The systems also vary in whether they include content specific to FCC providers. Some of the systems have courses designed specifically for FCC providers, while others have content or examples specific to FCC providers embedded in courses for a broader audience of CCEE teachers and caregivers.

/ **Alignment with competency frameworks or observational measures.** By design, all of the systems we reviewed are competency-based. That alignment takes different forms. Specifically, the online PD systems could have been developed to align with a specific framework or observational measure of competencies or to have components informed by a specific framework or observational measure. In some cases, the alignment was determined and documented after the online PD system was developed. There is also variation in the types of competency frameworks that inform the online PD system. This includes a national framework, state frameworks or early learning guidelines, and observational competency measures.

/ **Multifaceted systems.** All five systems have interactive training content that includes reading materials, videos, presentations with voiceovers, checklists, and suggested classroom activities. Some are also part of a larger system that includes other PD, coaching, integration with QRIS, and credentialing. Competencies are also assessed in various ways, both within and across systems—through multiple-choice assessments, self-reflection activities, and checklists—and at various points during the training (before, after, and/or during the training). Two of the systems are either aligned with or informed by an observational measure of competencies. These differences in training content, approach, and assessment may have implications for how effectively the systems for improve teacher and caregiver competencies and what incentives are available for teachers and caregivers to engage in the systems.

/ **Evidence base for online PD systems.** Finally, three of the five systems have or are building an evidence base for the PD system, including planning for future studies. These studies generally focus not only on the online components of the system, but also complementary supports that are provided. One of the studies used an RCT, and two used a pre-post design. These three systems varied in the type of study (pre-post design and RCT), age group of the children (infants, toddlers, and/or preschool-age children), and setting (center-based, community-based, and/or FCC).

Areas for future learning

Overall, more research is needed to help the CCEE field develop and refine evidence- and competency-based virtual PD for teachers and caregivers of infants and toddlers. Some specific topics that warrant further exploration include:

/ **The intersection of access, motivation, and support.** Future research should explore how to effectively address access issues, and this should be combined with explorations of how to best motivate and support teachers and caregivers to build their competencies and how they feel online learning best fits on their path toward building competencies. For example, language barriers could be at least partially addressed if funding were available to translate course content or provide translators. However, this does not assure participation and persistence. Research should explore what factors encourage and enable teachers and caregivers to engage in online professional learning. Are teachers and caregivers more likely to sign up for online courses if they are offered in cohorts, or if a broad range of incentives for participation are offered? In addition, what steps should be taken to remove barriers to and support participation in online learning? For example, can state systems provide technology supports to teachers and caregivers? Such research should account for the diversity among infant and toddler teachers and caregivers and the types of settings they work in—for example, their backgrounds and work experiences, their professional goals, whether they have a professional community available to them already, the resources in their communities, and other factors.

/ **Maximizing the potential of online learning for improving competencies.** Online learning alone may not lead to a change in teacher or caregiver practice. Future research should explore what combination of supports alongside online, competency-based content can best support teachers and caregivers in improving their practice. This should include an exploration of whether these additional supports can be provided virtually or are best offered with an in-person component. For example, do virtual, facilitated peer cohorts encourage teachers and caregivers to reflect on what they are learning and practice new skills? Are there innovative ways that peers can support one another virtually to encourage practicing what was learned? Can virtual professional learning communities continue to serve as a resource for teachers and caregivers—particularly those who are isolated—once online courses officially end?

/ **Considerations for different CCEE settings.** The systems included in this scan vary in the degree to which the content offered is specifically for teachers and caregivers of infants and toddlers and whether there is any variation depending on the type of setting they work in (center-based

or home-based). Given the unique opportunities and challenges of caring for infants and toddlers, future research should explore whether the more generalized courses can help address the knowledge and skills needed for teaching and caring for infants and toddlers. Further, future research could explore whether content is appropriately differentiated for home-based providers who may be caring for mixed age groups.

/ **Innovative approaches to assessment.** Though online, competency-based PD systems already use a variety of tools to assess what teachers and caregivers learn, future research should explore the feasibility of innovating assessment approaches. For example, if these systems can integrate video-based assessment, might this improve the systems' ability to provide feedback and suggested areas for future learning that increase the likelihood of improved practice?

Key definitions

The ITTCC project has defined competency, competency framework, competency-based professional development, and proficiency levels as follows:

Competency: a piece of knowledge (K), a skill (S), or an attribute (A) essential to the practice of teaching and caring for infants and toddlers.

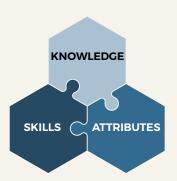**Knowledge** is information that may be applied to practice.

Skills are strategies or abilities that may be applied to practice.

Attributes are attitudes, beliefs, or other characteristics that may influence the application of knowledge and skills to practice.

Competency framework: a compilation of competencies (that is, KSAs).

Competency-based professional development (PD): PD that focuses on supporting teachers and caregivers of infants and toddlers in mastering specific competencies (that is, KSAs).

Proficiency levels: Competencies (that is, KSAs) that are essential for practice at various career stages (for example, entry, mid-career, advanced)

Endnotes

[1] We present information about each of the systems in alphabetical order unless particular systems are most illustrative of the key finding presented.

[2] For ease in reading, we refer to the sub-components of larger courses as modules, but each system may use different language.

[3] Council for Professional Recognition. "Child Development Associate (CDA) Credential® Competency Standards." n.d. Available at www.cdacouncil.org/about/cda-credential/competency-standards.

[4] CLI Engage. "CIRCLE Infant & Toddler Teacher Competencies Observation & Notetaking Form." 2021. Available at https://public.cliengage.org/training/support/how-to-guides/infant-and-toddler-classroom-observation-tool-and-goal-setting-system/.

[5] CLI Engage. "Texas Infant, Toddler, and Three-Year Old Early Learning Guidelines." 2021. Available at https://childrenslearninginstitute.org/resources/itelg/.

[6] The Child Development Associate® (CDA®) Credential™ is a national credential issued by the Council for Professional Recognition. Users interested in earning a CDA® credential must follow the requirements to submit an application with the Council for Professional Recognition. This includes an additional fee separate from using the online PD system. Online professional development systems described in this brief provide courses that can be used toward earning the professional education hours required for applying for the CDA.

[7] Pianta, R.C., K.M. La Paro, and B.K. Hamre. *Classroom Assessment Scoring System™: Pre-K Manual*. Baltimore, MD: Paul H. Brookes Publishing, 2008.

[8] CLI Engage. "CIRCLE Infant & Toddler Teacher Competencies Observation & Notetaking Form." 2021. Available at https://public.cliengage.org/training/support/how-to-guides/infant-and-toddler-classroom-observation-tool-and-goal-setting-system/.

[9] Texas Early Learning Council and Texas Head Start State Collaboration Office. "Texas Core Competencies for Early Childhood Practitioners and Administrators." Houston, TX: Children's Learning Institute at The University of Texas Health Science Center at Houston, March 2013.

[10] Maine Roads to Quality Professional Development Network (MRTQ PDN). "Maine's Infant Toddler Credential." 2021. Available at https://www.mrtq.org/wp-content/uploads/2019/04/Infant-Toddler-Credential-Brochure-10.21.pdf.

[11] Council for Professional Recognition. "Child Development Associate (CDA) Credential® Competency Standards." n.d. Available at www.cdacouncil.org/about/cda-credential/competency-standards.

[12] Collaborative for Understanding the Pedagogy of Infant/Toddler Development (CUPID). "Draft Competencies for the Infant/Toddler Workforce." Unpublished manuscript, 2015.

[13] ZERO TO THREE. "ZERO TO THREE Critical Competencies for Infant–Toddler Educators™." Washington, DC: ZERO TO THREE, 2020.

[14] VLS has also conducted pilots in community-based settings where they provided the coaches or partnered with a program to train and support a coach.

[15] Personal communication with J. Conley, March 10, 2022.

[16] "CIRCLE Infant & Toddler Teacher Competencies Observation & Notetaking Form." 2021. Available at https://public.cliengage.org/training/support/how-to-guides/infant-and-toddler-classroom-observation-tool-and-goal-setting-system/.

[17] Crawford, A., C. Varghese, Y. Oh, C. Guttentag, T. Zucker, S. Landry, and R.A. Cummins. "An Initial Investigation of the CIRCLE Infant-Toddler Teacher Training for Toddler Teachers." *Early Education and Development*, August 2021, pp. 1–25. https://doi.org/10.1080/10409289.2021.1961427

[18] In personal communication with the representatives of the PD system (A. Crawford and R. Cummins, February 18, 2022), as of February 2022, in another study, CLI is enrolling 100 teachers and caregivers in a pre-post design pilot study of the Infant-Toddler Specialist Network training model, which is primarily focused on the CIRCLE Infant-Toddler Teacher Training. It will examine the impact of teachers' participation in the Infant-Toddler Specialist Network training model on teacher-child interactions, the classroom environment, and children's development as measured by teacher reports. It also plans to collect self-report measures of teachers' stress and self-efficacy, as well as metadata that tracks the completion of courses.

[19] Lang, S.N., L. Jeon, E.B. Sproat, B.E. Brothers, and C.K. Buettner. "Social Emotional Learning for Teachers (SELF-T): A Short-Term, Online Intervention to Increase Early Childhood Educators' Resilience." Early Education and Development, vol. 31, no. 7, April 2020, pp. 1112–1132. https://doi.org/10.1080/10409289.2020.1749820

[20] Personal communication with S.N. Lang, February 15, 2022.

[21] Atkins-Burnett, S., L. Tarullo, S. Monahan, F. Hurwitz, T. Bruursema, A. Li, E. Blesson, J. Cannon, A. De Mond, and A. Heckler. "The We Grow Together Professional Development System Final Report of the 2019 Field Test." OPRE Report #2020-170. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation, 2020.

[22] Atkins-Burnett, S., S. Monahan, L. Tarullo, Y. Xue, E. Cavadel, L. Malone, and L. Akers. "Measuring the Quality of Caregiver-Child Interactions for Infants and

Toddlers (Q-CCIIT)." OPRE Report #2015-13. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation, 2015.

[23] Nguyen, T., S. Atkins-Burnett, S. Monahan, L. Tarullo, Y. Xue, and J. Cannon. "Supporting Responsive Caregiving for the Youngest Children: Psychometric Evidence of the Quality of Care for Infants and Toddlers (QCIT) Observational Measure." Washington, DC: Mathematica, forthcoming.

[24] In personal communication with the representative of the PD system (S. Caverly, February 22, 2022), there will potentially be an evaluation of the system.

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