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Online child care training in the United States: a preliminary investigation of who participates, what is offered, and on which topics the workforce is focusing

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Abstract

Current US policies call for a child care teacher workforce that can support program quality and enhance infants', toddlers', and preschoolers' learning and development. Given minimal state pre-hire requirements, this context has implications for the workforce's in-service training. Yet, there is limited research on who participates in training, the focus of what is offered, and variations in participation rates across topics. Also needed is a better understanding of the role online training might play in meeting the workforce's in-service needs. To address these interrelated issues, I present descriptive analyses of a convenience sample of aggregate data from a US-wide online child care training provider. Enrollees' ages and education levels reflect the larger child care workforce. The majority of the offered training is at the beginner level and 1 h in duration. Since 2010, enrollees completed an average of 10–12 online training hours annually. Roughly one-third of the completed training was related to planning a safe, healthy learning environment. These findings suggest the need for more rigorous research on child care workforce participation in training, particularly related to the extent to which online training can respond to policies aimed at enhancing workforce capacity to support program quality and young children's learning and development.

Keywords: Child care, Child care teachers, Child care workforce, Child care training

Background

The current US policy context is increasingly focused on enhancing the child care workforce's knowledge and skills as a means for improving program quality, implementing early learning guidelines, and supporting the cognitive and developmental outcomes of children age birth to 5 years (Institute of Medicine and National Research Council 2012). This interest reflects a significant research base demonstrating the relationship between preschoolers' early learning gains and their teachers' pedagogical knowledge and instructional-related interactions (e.g., Burchinal et al. 2008; Burchinal et al. 2010; Cash et al. 2015; Curby et al. 2009; Early et al. 2017; Mashburn et al. 2008). And, child care quality is related to young children's cognitive and developmental outcomes (Academy

and of Pediatrics Committee on Early Childhood, Adoption, and Dependent Care 2005; Peisner-Feinberg et al. 2001).

This focus on enhancing the workforce's knowledge and skills is warranted, as 40 US states require newly hired, child care teachers for children age birth to 5 years (and defined here as the adult who works directly with children in a specific classroom and is counted in the classroom's staff–child ratio) to attain only a high school diploma or less. Requirements for licensed family child care providers are even less stringent, with only 16 US states requiring a minimum of a high school diploma or equivalent exam (Child Care Aware 2012; Gomez et al. 2015). Perhaps not surprisingly, just 25% of individuals working as teachers in child care centers are estimated to have a Bachelor's degree (Bassok et al. 2013; National Survey of Early Care and Education Workforce File 2012). Data on paid family child care providers suggest that just 15% have attained a Bachelor's degree (National Survey of Early Care and Education Project Team 2016).

Given this discrepancy, the US early childhood advocacy community has issued calls for long-term policies requiring child care teachers to attain a Bachelor's degree related to early childhood education and thus also meet the pre-service requirements for teachers in federally funded Head Start preschool classrooms and most state-funded PreKindergarten programs (Institute of Medicine and National Research Council 2012). In the short term, researchers have noted the need for better data on rates of participation in in-service training which may not lead to a degree, but aims to enhance the child care workforce's capacity to support child care quality and promote young children's learning, nonetheless (Gomez et al. 2015). In addition, it could be useful to have a better sense of the role online-based training plays in meeting the child care workforce's training needs (Stone-MacDonald and Douglass 2015), especially since such training may be useful for individuals who lack access to in-person options due to cost, geographic constraints, or personal or professional obligations, or merely prefer to learn at their own convenience and pace (Aikens et al. 2016; Donohue and Fox 2012; National Center on Child Care Professional Development Systems and Workforce Initiatives 2014; Olsen et al. 2010).

With the aim of expanding the field's understanding of workforce participation in in-service training, as well as the extent to which such participation is likely to support policies aimed at improving child care quality and promoting young children's learning, I report here the results of secondary analyses of a convenience sample of aggregate data from a nationwide provider of online-based, child care-relevant training. For clarity, 'training' refers to topic-focused instruction (and sometimes characterized as a class, course, workshop, or presentation) which is offered outside of the formal higher education system and thus is not intended to lead to a degree, but typically requires enrollment so that an individual may receive an acknowledgement of completion. In turn, such acknowledgement allows an individual to demonstrate that he or she has met a specific state or employer training mandate (Child Care Aware 2016a, b, c; Kagan et al. 2008). In addition, online-based training is defined as instruction which is delivered primarily through the internet, rather than taking place in the physical classroom in which the instructor and students are located (Benjamin et al. 2008; Means et al. 2010).

To set the stage for the study, I first briefly summarize the current US child care workforce training policy context. I then review prior research on the training needed to enhance infant, toddler, and preschool teachers' capacity to support various aspects

of child care quality and promote young children's learning. After sharing the study's results, I conclude with some implications, as well as several important topics to be explored through future research.

Child care workforce training policy context

To further underscore the importance of research on the post-hire training completed by the US child care workforce, it is helpful to briefly highlight three federal and state policy contexts which contribute to the demand for such training. Across all three contexts, there is a focus on training related to structural quality—and defined as the regulatable features within early care and education settings which protect children from harm and support positive experiences—and process quality, or the experiences and interactions available to children (Huston 2015). Another notable commonality is the emphasis on meeting specific hourly and topic-related training requirements.

Child Care Development Fund (CCDF)

The first important context driving the demand for workforce training is states' federal Child Care and Development Fund (CCDF, Child Care and Development Block Grant Act, 2014) awards, which mandate initial and ongoing training requirements for teachers in settings accepting CCDF family assistance vouchers. This training must cover a variety of structural quality-related, health and safety topics. Such topics include recognizing symptoms of illness, preventing and controlling infectious disease, administering medication, emergency procedures, and first aid and Cardio Pulmonary Resuscitation (National Center on Child Care Quality Improvement 2015).

States' biennial CCDF plans also are required to include a focus on improving the workforce's process quality-related knowledge and skills related to meeting the developmental needs of participating children. For example, states must report via their CCDF Quality Performance Reports how many center-based teachers, family child care providers, and legally exempt providers received training on the state's early learning guidelines. Also required are data on the number of programs receiving targeted technical assistance related to such topics as understanding developmental screenings and observational assessment tools for program improvement purposes (Matthews et al. 2015).

State child care licensing regulations

A second key policy context is state child care licensing regulations, which govern teachers' pre-hire qualifications, post-hire initial training, and the training to be completed on an annual basis. As mentioned above, 40 US states require center-based child care teachers to attain only a high school diploma or less (Child Care Aware 2012; Gomez et al. 2015). Upon being hired, and in line with CCDF requirements, the majority of states require initial training related to children's health and safety, emergency preparedness, licensing regulations, and child abuse reporting (Child Care Aware 2013). As an example, in the state of North Dakota, newly hired staff are required to complete 'Basic Child Care Training.' Ten of the 15 required hours focus on health and safety, illness prevention, food and nutrition, maltreatment reporting, and emergency preparedness (Child Care Aware of North Dakota 2016). Research conducted just a few years ago suggested that fewer than half of all the US states required initial training on child development

and learning activities (Child Care Aware 2013). However, given the recent CCDF focus on enhancing the workforce's knowledge regarding early learning guidelines, these data may not reflect current policies. For example, the Tennessee Department of Human Services requires newly hired, licensed center-based teachers to complete online training related to the state's Early Learning Developmental Standards for infants, toddlers, and preschoolers, and with each training module to be of 3 h in duration (Tennessee Early Childhood Training Alliance, n.d.)

In addition to this initial training, 48 states require staff in child care centers to undergo specific amounts of annual training. These amounts vary widely, with 10 states requiring 11 or fewer hours, 24 states requiring between 12 and 17 h, and the remaining states requiring 18 or more hours. While 40 states require annual training on health and safety issues, in roughly two-thirds of states, varying amounts of annual training also are required related to child development, child guidance and behavior, and/or learning activities (Child Care Aware 2013; US Government Accountability Office 2012).

Quality rating and improvement system (QRIS) initiatives

A third context driving the need for child care training is QRIS initiatives, which are being implemented, piloted, or planned in every US state, and in many cases have been created, developed, or expanded using states' CCDF awards. These initiatives generally have two purposes: to provide parents and other consumers with information regarding the comparative quality of child care programs so that they can make better informed choices, and to incentivize participating programs to maintain or improve their structural and process quality as a means for better supporting children's development and early learning. At least 38 QRIS initiatives have quality categories focused on child care staff education and training. Some states also require training related to specific topics, such as caring for infants and toddlers or a state's early learning guidelines. And, due to the very low average pay rates for US child care teachers (Whitebook et al. 2014), as an incentive to the workforce to attain higher education levels and/or participate in training, many QRIS offer scholarships to cover tuition or training fee costs (Gomez et al. 2015; QRIS Compendium 2016; U.S. Government Accountability Office 2012).

Effective training for the US child care workforce

Given the minimal pre-service qualifications to be hired as a child care teacher in the US, policies requiring the workforce to complete post-hire initial and ongoing training make intuitive sense. And, as Fukkink and Lont's (2007) meta-analysis demonstrates, 'training seems to matter' for enhancing the child care workforce's skills and knowledge (p. 305). Indeed, individual research studies suggest the provision of training to non-degreed teachers (i.e., who have not attained a college degree in any area) is related to improvements in structural quality (Kontos et al. 1996), more developmentally appropriate practice beliefs (Heisner and Lederberg 2011), and better child outcomes (Landry et al. 2009, 2011; Neuman and Cunningham 2009). Additional research finds the quantity of training attended by non-degreed teaching staff is correlated with an increase in classroom environment quality scores (Burchinal et al. 2002; Rous et al. 2008).

Yet, a growing research base suggests the mere provision of training does not necessarily result in bringing about any intended outcome, especially if the aim of training is

to improve teachers' capacity to enhance the quality of their pedagogical interactions and support children's learning. Instead, training providers must consider several key factors.

Alignment with staff and/or work needs

The first factor to consider when designing training aimed at child care teachers is staff knowledge and practice needs, particularly in light of the context in which individuals work. Context can include the ages of the children served (e.g., infants and toddlers versus preschoolers) and their home languages (Winton et al. 2016; Zaslow et al. 2010). Also to be considered are the programmatic inputs used (e.g., curriculum) and the availability of onsite mentoring to follow up on any training (Fuglini et al. 2009; Howes et al. 2003; Vu et al. 2008). The extent to which there is a 'culture of learning' for teachers also appears to play a role (Ackerman 2007; Connors 2016).

Training may need to be accompanied by tangible classroom resources, as well. For example, a study of six US child care programs found classroom staff could not fully benefit from training focused on enhancing teacher–child interactions unless their classrooms also were provided with needed play-based learning materials (Wilcox-Herzog et al. 2013). In another small study of coaches working as part of a QRIS initiative, one challenge faced was the lack of funds to purchase the equipment and supplies that would lead to improved structural quality (Ackerman 2008).

Matching training with learning goals

A second key factor to consider is the intensity and duration of training necessary to support the content of what is being learned (Lauer et al. 2014; Winton et al. 2016; Zaslow et al. 2010). Single classes may be adequate for improving teachers' ability to appropriately engage in stand-alone activities to be performed in a standardized way across all settings. Such activities include reducing the risk of sudden infant death syndrome, implementing nutrition best practices, or meeting specific licensing regulations (Byington et al. 2011; Kakietek et al. 2014; Moon and Oden 2003; Moon et al. 2008; Van Stan et al. 2013). This research base also suggests the sequence of training received on these topics may not be an issue. For example, a child care teacher typically will not need prior training on sudden infant death syndrome to understand and benefit from training focused on hand washing.

Single trainings also can be useful for increasing the workforce's initial knowledge about specific aspects of process quality, such as the importance of screening for children's mental health (Gleason et al. 2012). However, effective training to support teachers' capacity to appropriately engage in high-quality pedagogical activities likely requires building on a prior knowledge base, and thus sequence can be critical (Minor et al. 2016). For example, conducting ongoing assessments of children's learning and development as a means for informing teachers' practice requires a solid grounding in child development, the content of what is being taught, and early childhood pedagogy (Buysse et al. 2013; Ertle et al. 2008; Ginsburg 2009; Gummer and Mandinach 2015). This is particularly critical if young children speak a home language other than English and/or are identified as having special needs (Ackerman and Tazi 2015; Wall 2011). Thus, while it may be useful to provide new staff with a single introductory training on the use of

formative or summative assessments, improving their knowledge and practice related to the administration of specific assessments and/or assessment approaches likely requires an ongoing effort.

Similarly, training may aim to expand individuals' knowledge and practice across multiple aspects of an academic domain (e.g., mathematics) or domains, or improve more global facets of child care quality. In this case, a single workshop may not be adequate, especially if teachers have minimal prior levels of knowledge about, or experience with, the focus of the training (Manning and Avery 2007; Moreno et al. 2015; Zaslow 2014). And, if the aim of training is to improve early childhood pedagogical practices as a means for also enhancing the level of teachers' interactions with infants, toddlers, and preschoolers, and/or young children's learning outcomes, greater amounts of intensive training and/or training plus coaching may be necessary (Campbell and Milbourne 2005; Early et al. 2017; Fabiano et al. 2013; Gerde et al. 2014; Hamre et al. 2012; Koh and Neuman 2009; Neuman and Cunningham 2009; Ota and Berghout Austin 2013; Pianta 2011; Pianta et al. 2014; Piasta et al. 2012; Yamauchi et al. 2013).

Child care training delivery options

Winton et al. (2016) argue that a third important factor to consider when designing training is the way in which it will be delivered, especially in light of the needs of the individual receiving it and the content of what is being learned. Like other education-related endeavors, the child care workforce traditionally participated in classroom-based training, meaning individuals physically traveled to the location where instruction was offered. To support what was learned in training, they also may have met with a coach, mentor, or technical assistance provider in their classroom or school/center (e.g. Caruso et al. 1998; Ewen and Goldstein 1996; Snell et al. 2013). However, due to the steady increase in online access and use of technology devices (Pew Research Center 2017a, b), settings serving infants, toddlers, and preschoolers are increasingly relying on online-based technology as a pedagogical tool. For example, computers, tablets, and smartphones are now used to document and assess children's learning, facilitate teachers' practice, and communicate with parents (Hamilton and Edge 2016; Parette et al. 2013; Parnell and Bartlett 2012; Pasnik and Llorente 2013; Wartella et al. 2013).

Similarly, this expansion has changed the ways in which both degreed and non-degreed teachers, who work with children age birth to 5 years, access training and interact with other individuals who can support their learning. For example, an array of colleges and universities, for-profit companies, and nonprofit agencies (e.g., child care resource and referral agencies) are providing online training. Teachers are uploading videos of their classroom activities and are participating in video-, audio-, electronic mail-, or text-based conferences with coaches, technical assistance providers, and each other. They are also accessing online print resources. In addition, many early childhood classroom-focused curricula and assessment developers offer online classes related to using their products (Artman-Meeker and Hemmeter 2012; Dennis and Horn 2014; Diamond and Powell 2011; Donohue et al. 2007; Downer et al. 2009; Garvis and Lemon 2015; Gomez et al. 2015; Hernandez et al. 2015a, b; Kinzie et al. 2006; Torrence and Donohue 2007).

The quantity of available research related to the efficacy of online instruction is mixed, and likely due, in part, to the need for researchers to 'catch up' with current practices. For example, numerous studies situated in K-12 and post-secondary settings suggest that online classes can be as effective as traditional classroom-based instruction (Means et al. 2013; Ni 2013). However, research comparing the effects of online versus traditional classroom-based training on the non-degreed child care workforce's knowledge and skills appears to be limited to stand-alone health and safety topics (e.g., Rheingold et al. 2012, 2015). At the same time, a growing body of research demonstrates that the combination of intensive online training and other professional supports (e.g., ongoing coaching) can be effective for improving degreed PreKindergarten teachers' instructional interactions with preschoolers (Lee et al. 2012; Pianta et al. 2008, 2014), as well as preschoolers' learning outcomes (Cabell and Downer 2011; Downer et al. 2011; Kinzie et al. 2014).

The field also could benefit from additional research on the ages and educational background of online training consumers. This issue is salient, as access to appropriate in-service training is an equity issue in terms of opportunities for all programs serving children age birth to 5 years to improve the quality of care and education provided, no matter what their funding stream (Gomez et al. 2015). Evaluations of initiatives aimed at improving the knowledge and skills of the US child care, federally funded Head Start, and state-funded PreKindergarten teachers also recommend that states offer online training as a means for ensuring high-quality content is consistently available to all interested individuals (Lastinger Center 2012).

The results of research conducted thus far on the characteristics of online training users are mixed. For example, a study of nearly 5900 home-based family child care providers in 42 US states found individual users are diverse in terms of their ethnicity and years of experience (Durden et al. 2015). However, another survey of 231 early care and education staff in one US state showed only half of the participants were comfortable with the technology needed to complete online training (Stone-MacDonald and Douglass 2015). Similarly, a three-state study of nearly 600 home- and center-based child care providers found individuals were more likely to prefer online training over traditional classroom-based approaches as long as they were comfortable using the internet as part of their daily work (Weigel et al. 2012). And, in a study of 131 Australian early childhood educators, researchers found older teachers were least likely to access online resources (Thorpe et al. 2015). In short, while online training may expand the workforce's access options, practically speaking that may only be the case for individuals in specific age groups.

Rationale for the current study

There is an increasing policy focus on enhancing the US child care workforce's capacity to support infant, toddler, and preschooler program quality and young children's learning and development. This policy focus on training is important given state regulations regarding the minimal educational qualifications needed to begin working as a child care teacher, as well as research on the important role teachers' interactions with students play in young children's learning outcomes. Yet, due to differences in the workforce's current knowledge and skills, the settings in which they work, and the policies regulating

those settings, the training needed by teachers to support structural or process quality is not likely to be 'one size fits all.' What effective training looks like in terms of its intensity and duration is topic dependent, as well. In short, the mere provision of training may not be sufficient to improve child care quality and promoting young children's learning.

Given this context, researchers have noted the need for better data on rates of participation in in-service training which may not lead to a degree, but aims to enhance the child care workforce's capacity to support child care quality and promote young children's learning, nonetheless. However, the current research base on offered and completed US child care training is limited to a few state-specific studies (e.g., Cox et al. 2015; Linder et al. 2016; Susman-Stillman et al. 2014). In addition, recent research has not yet examined the extent to which training aimed at the US child care workforce as a whole is available on an online basis, much less the topics offered and the duration and intensity of training related to any topic. More research is also needed about the online training in which the workforce has enrolled, as well as enrollees' demographics in terms of their age, education background, and staff position.

To expand the field's understanding of these interrelated issues, I undertook quantitative research guided by the following research questions:

1. What are the ages, education levels, and occupations of individuals accessing online training?
2. What does online training 'look like' in terms of intended audience, duration, and topics?
3. To what extent do completed hours of online training vary between topics from 2010 to 2015?
4. On average, how many annual hours of online training did individuals complete in the period of 2010–2015?
5. What are the implications of these results in regards to the potential for online training to effectively respond to policies aimed at enhancing the workforce's capacity to support program quality and young children's learning and development, as well as for future research?

Discussed next is the methodology for the study.

Methods

Data source

The current study was informed by a convenience sample of aggregate data provided in 2016 by a for-profit training provider of online single course training aimed at the child care and afterschool workforce across the US. I gained access to these data as part of prior conversations with the provider's CEO/President about an unrelated research project.

Since 2005, over 200,000 individuals from all 50 states and the District of Columbia have enrolled in approximately 1.8 million of the training provider's classes, which are known as 'courses' (personal communication with the CEO/President, 10 July 2015). The provider's decisions regarding which courses to offer are in large part based on state and federal child care training-related policies and related needs (personal communication

with the CEO/President, 4 February 2016). The courses are advertised as meeting state child care licensing regulations and QRIS criteria, the requirements of the Child Development Associate (CDA) credential[1], and state-specific credential opportunities. Therefore, given both the aim of the study and the provider's 10-year history in the online child care training market, analyses of these data appeared to represent a unique opportunity.

Courses

Individual courses are tagged with one of eight CDA categories and based on the main content of the course. In 2016, these courses could be purchased on a per-hour basis for US $12–$15 (depending on the number of hours accessed), an annual subscription basis for US $99, or as part of a 20- or 50-user center-based subscription (US $499 and $999, respectively). The training provider also offered an online instructor-supported CDA certificate program, state-specific director and child care professional credential coursework, and 'mini-certificates,' which bundled 6–12 h of courses related to specific topics (e.g., positive guidance). However, data related to these course takers were not provided and thus were not included in the study.

The courses are presented in a slide-like format, with each slide containing text and images. Some courses also have online links to video content, as well as reflection exercises. Course takers are asked to respond to one or two multiple-choice questions every 10–15 slides, with progression to the next set of slides dependent on correctly answering these interim questions. Each course also concludes with an assessment containing approximately 8 questions per course hour. Passing a course requires 70% of a test's items to be answered correctly (personal communication with the provider's CEO/President, 8 February 2016).

Data used and analysis approach

To address the study's research questions, I conducted secondary analyses of four separate, aggregate datasets which had been collected by the training provider for business purposes: 2015 de-identified course taker's self-reported registration information, 2016 offered courses, 2010–2015 completed course hours related to each CDA category, and the number of individuals enrolled in at least one individual course during each of these 6 years (see Table 1). In all cases, the data were related to individual courses and their respective course takers, as opposed to enrollees in the provider's CDA or other certificate programs.

Because these aggregate datasets were both de-identified and decoupled from each other as a means for maximizing participant confidentiality (Corti and Thompson 2012;

[1] The Child Development Associate (CDA) Credential is the minimum qualification to be hired as a child care teacher in licensed centers in three US states, as well as in the federally funded Early Head Start program for infants and toddlers (Author, unpublished work). The credential is also a voluntary milestone step in the majority of states' child care career ladders or lattices (Missouri Coordinating Board for Early Childhood 2014) and are tracked through CCDF-supported early care and education workforce registries, which are being piloted or implemented in 44 states (Ackerman 2016). Attaining the CDA requires 120 clock hours of training across an array of structural and process quality topics, with at least 10 hours of training in each of the areas of (1) Planning a safe and healthy learning environment, (2) advancing children's physical and intellectual development, (3) supporting children's social and emotional development, (4) building productive relationships with families, (5) managing an effective program operation, (6) maintaining a commitment to professionalism, (7) observing and recording children's behavior, and (8) understanding principles of child development and learning (Council for Professional Recognition 2015).

Table 1 Research questions and data sources

Research question	Relevant training provider dataset(s)
1. Course-taker demographics	2015 course takers' registration information
2. Focus of online training	2016 offered courses
3. Rates of participation between training topics	2010–2015 completed course hours
4. Average per-person completed training hours	2010–2015 number of course takers 2010–2015 completed course hours

Kum and Ahalt 2013), it was not possible to conduct complex, multivariable analyses. Therefore, each research question was addressed by conducting frequency analyses of the relevant dataset. I also converted the quantity of hours into a percentage of total training hours.

Results

Demographics of online course takers

As part of the initial account registration process, the training provider does not request users to provide information regarding the early care and education sector (e.g., child care center, family child care, Early Head Start, state-funded PreKindergarten) in which they work or their gender. However, course takers are asked to indicate their 'Current Occupation' and 'Education Level' via pre-populated drop-down boxes, as well as their date of birth.

Frequency analysis of initial registration data from 2015 individual course takers ($N = 40{,}559$) shows 53.4% self-reported their occupation as a teacher or assistant teacher in settings serving infants, toddlers, and preschool-aged children ($N = 21{,}683$). Twenty-two percent of individuals self-reported their occupation as floater ($N = 8937$), which typically means the person 'floats' between classrooms on an as-needed basis, as opposed to being assigned to a single classroom (Russell 2016). Less than 2% of course takers ($N = 591$) reported they work as a family child care provider. Another 10.3% ($N = 4161$) of course takers reported they serve in a Director or other administrative or managerial position. The remaining 12.8% of course takers ($N = 5187$) reported their occupation as being in a kindergarten, school-age, or 'other' setting (see Table 2).

In addition, 44.7% ($N = 18{,}120$) of 2015 course takers reported their education level as having a high school diploma or General Education Diploma (GED). An additional 27.6% reported the attainment of some college ($N = 5299$), a CDA ($N = 2268$), or an Associate's Degree ($N = 3625$). Another 23.7% reported they have a Bachelor's degree or higher. The remaining individuals reported they hold a state-based certified child care professional, infant/toddler, school-age, or director credential.

Finally, of the 33,108 2015 course takers who reported their date of birth at the time of registration (and from which age in years was calculated), 44.2% ($N = 14{,}645$) were between 18 and 32 years old. An additional 44% ($N = 14{,}533$) reported their age range as 33–55. The reported ages of the remaining 12% of course takers ranged from 56 to 89 years old.

Table 2 2015 course-taker occupation, education level, and age

Category	Number	Percent
Occupation ($N = 40{,}559$)		
Teacher or assistant	21,683	53.4
Floater	8937	22.0
Family child care provider	591	1.5
Director or other administrative/managerial position	4161	10.3
Kindergarten, school-age, or other setting	5187	12.8
Education level ($N = 40{,}559$)		
High school diploma or GED	18,120	44.7
Some college, a CDA, or an associate's degree	11,192	27.6
Bachelor's degree or higher	9595	23.7
State-based credential	1652	4.1
Age ($N = 33{,}108$)		
18–32	14,645	44.2
33–55	14,533	43.9
56–89	3840	11.6

2016 offered courses

Analysis of the data also showed that in 2016 the training provider offered 129 one- to 4-h Beginner, Intermediate, and Advanced courses. Beginner Training was defined as being 'most appropriate for those beginning their career or… are exposed to new information or concepts.' Intermediate training was aimed at 'professionals who have an adequate understanding of basic child development concepts/theory and have begun to make the connection of what they know to their everyday work with children.' Advanced training was designed to 'challenge the experienced professional to synthesize, form generalizations, draw conclusions, apply, and modify acquired knowledge into everyday practice.'

While the provider offered individual courses in all three categories, 74% ($N = 96$) were at the Beginner level and just 2% were at the Advanced Level. In addition, 72% ($N = 93$) of the courses were 1 h in duration. However, because the remaining courses were up to 4 h long, the quantity of courses and hours varied within and between the eight CDA categories.

As seen in Table 3, the highest number of courses ($N = 27$) were related to 'Planning a safe and healthy learning environment.' Three examples of 1-h Beginner courses related to this topic included *Indoor Safety in the Early Childhood Setting*, *Sudden Infant Death Syndrome*, and *Shaken Baby Syndrome*. A 1-h intermediate level course within this category is *Fit for Life*, which 'provides strategies and methods to improve physical fitness and incorporate movement activities across the curriculum.'

The highest number of course *hours* ($N = 42$) were related to 'Managing an effective program operation.' Three examples of 1-h Beginner courses in this category were *Staff Retention & Motivation (Part I)*, *Time Management Skills for Administrators*, and *Successful Staffing.* An intermediate level course within this category included a 1-h follow-on class entitled *Staff Retention and Motivation (Part II).*

Training related to 'Advancing children's physical and intellectual development' ranked the third highest for number of courses ($N = 24$) and the second highest in number of

Table 3 2016 offered courses and hours related to CDA competency areas

CDA competency area	Courses		Hours	
	Number	Percent	Number	Percent
Safe, healthy learning environment	27	20.9	33	17.6
Physical and intellectual development	24	18.6	34	18.2
Manage an effective program	26	20.2	42	22.5
Social and emotional growth	20	15.5	31	16.6
Relationships with families	5	3.9	5	2.7
Commitment to professionalism	8	6.2	13	7.0
Observing and recording behavior	3	2.3	3	1.6
Child development and learning	16	12.4	26	13.9
Total	129		187	

course hours ($N = 34$) (see Table 3). An example of a 1-h Beginner course in this category is *Brain Development and Learning: What Every Early Care and Education Professional Should Know*, and with a key goal being to help students 'identify three protective factors or strategies for reducing a child's stress.' Another 1-h Beginner course is *Birth to Five: Cognitive Development in Young Children*, which aims to 'introduce students to such early cognitive changes as the development of memory, cause and effect, and problem solving.' An example of a 2-h intermediate course is *The Importance of Play in Early Childhood*, which as the title suggests, 'provides an overview of the importance of play for promoting children's development… and ways to promote more play in children's lives.'

Due to the number of courses and hours related to 'Planning a safe and healthy learning environment,' 'Advancing children's physical and intellectual development,' and 'Managing an effective program operation,' these combined categories represented 60% of all 2016 courses ($N = 77$) and 58% of all course hours ($N = 109$). Among the remaining CDA categories, 'Commitment to professionalism' was addressed through eight courses. Five single-hour courses were related to 'Building productive relationships with families.' Finally, the fewest number of individual courses and hours ($N = 3$) were related to 'Observing and recording children's behavior.'

Variations in 2010–2015 training participation rates

Table 4 displays the annual number of completed training hours related to each CDA category for 2010–2015, as well as percentage of total annual hours each quantity represents. As seen in the table, training related to the category of 'Planning a safe, healthy learning environment' consistently had the highest relative participation rate in each of the 6 years. These rates ranged from a low of 26.5% in 2014 to a high of 36.8% in 2011. This topic also retained its first-place spot when combining all 6 years of training hours. The second-highest rate of participation in each of the 6 years was for training related to 'Steps to advance children's physical and intellectual development.' The training rates for this topic ranged from 16.5% in 2010 to 24.5% in 2013. Not surprisingly, the topic also had the second-highest percentage of training hours when the data for all 6 years are combined.

Table 4 2010–2015 completed training hours and percent of total annual hours

CDA competency area	2010	2011	2012	2013	2014	2015	Overall
N	22,387	27,483	32,666	35,860	37,061	40,559	
Safe, healthy learning environment	74,279	118,186	120,424	123,585	118,868	130,671	686,013
	33.4%	36.8%	32.0%	30.0%	26.5%	29.7%	30.9%
Physical/intellectual development	36,635	56,753	86,610	101,086	102,269	86,749	470,102
	16.5%	17.7%	23.0%	24.5%	22.8%	19.7%	21.2%
Manage an effective program	21,861	30,897	46,830	60,482	89,104	80,821	329,995
	9.8%	9.6%	12.4%	14.7%	19.9%	18.4%	14.9%
Social and emotional growth	34,260	41,386	47,036	51,856	57,952	57,449	289,939
	15.4%	12.9%	12.5%	12.6%	12.9%	13.0%	13.1%
Child development and learning	18,736	30,424	29,263	29,355	28,122	30,915	166,815
	8.4%	9.5%	7.8%	7.1%	6.3%	7.0%	7.5%
Relationships with families	17,328	22,602	22,205	19,832	22,254	21,991	126,212
	7.8%	7.0%	5.9%	4.8%	5.0%	5.0%	5.7%
Commitment to professionalism	12,890	11,502	15,137	15,499	18,877	20,691	94,596
	5.8%	3.6%	4.0%	3.8%	4.2%	4.7%	4.3%
Observing and recording behavior	6293	9439	9047	10,757	10,103	11,003	56,642
	2.8%	2.9%	2.4%	2.6%	2.3%	2.5%	2.6%
Total hours	222,282	321,189	376,552	412,452	447,549	440,290	2,220,314

Conversely, the number of hours of completed training related to each of four CDA categories never exceeded 10% of the annual total. Training related to 'Principles of child development and learning' ranged from a low of 6.3% in 2014 to a high of 9.5% in 2011. The topic of 'Strategies to establish productive relationships with families' experienced rates of participation ranging from less than 5% in 2013 to just under 8% in 2010. The percentage of total annual training hours for 'Maintaining a commitment to professionalism' ranged from 3.6 to 5.8%. Finally, training focused on 'Observing children's behavior' was least accessed, with the total number of training hours completed representing less than 3% in each of the 6 years.

Although the 2010–2015 annual training participation rates are consistent enough to demonstrate which training topics were the most and least accessed, the data in Table 4 also show some change over time. For example, in 2010, the percentage of training hours related to 'Safe, healthy learning environment' represented 33% of total annual hours and thus was nearly twice as large as the percent of training related to 'Steps to advance children's physical and intellectual development.' However, by 2014, these rates differed by less than 4% points. In addition, in 2010 training related to 'Managing an effective program' began at just under 10% of all hours. However, by 2013, this focus had the third highest rate of participation, and by 2015, nearly equaled the rates for training related to 'Advancing children's physical and intellectual development.'

Table 4 is also useful for emphasizing the extent to which training related to 'Observing and recording children's behavior' experienced very little change between 2010 and 2015. In short, the topic not only has the distinction of being the least-accessed, but also experienced consistent participation rates between 2.3 and 2.9%. As was noted earlier, in 2016 the provider offered only three individual courses primarily related to this topic.

Average per-person annual hours of online training

The study's final research question focused on the average number of hours of online training all individual course takers completed between 2010 and 2015. As displayed in Table 4, the quantity of annual completed training hours nearly doubled from 222,282 in 2010 to 440,290 to 2015. However, the number of individuals taking individual classes during this time period also increased from 22,387 to 40,559. Based on these data, in 2010, each course taker completed an average of 9.9 h of training. From 2011 through 2013, this training period rose to roughly 11.5 h, and in 2014, it was 12.1 h. Data for 2015 suggest individuals completed just under 11 h of training on average.

The typical user is reported to complete eight courses per year (personal communication with the provider's CEO/President, February 8, 2016). Therefore, combined with the study's findings regarding the number of courses which are 1 h in duration, these results appear to represent an accurate average. However, it is not clear if the variations between years reflect the addition of multi-hour courses to the provider's offerings during this time period (personal communication with the provider's CEO/President, July 13, 2015) and/or changes in state regulations or individual enrollee preferences.

Summary

In summary, the majority of online course takers reported they worked with infants, toddlers, and preschool-aged children. Their formal education levels ranged from a high school diploma or GED to a Bachelor's degree or higher. In addition, roughly the same percentage of course takers were reported to be between the ages of 18 and 32 as ages 33–55. Between 2010 and 2015, course takers completed an average of 10–12 h of online training.

Additional analyses suggest roughly 75% of 2016 offered courses were at the Beginner level and 1 h in duration. Conversely, only a few Advanced level courses were offered. In addition, the greatest number of courses offered were related to 'Planning a safe and healthy learning environment.' In contrast, the fewest number were related to the topic of 'Observing and recording children's behavior.' Accessed training related to these two topics experienced the highest and lowest respective participation rates from 2010 to 2015, as well. The potential policy and research implications of these findings are discussed next.

Discussion

In this study, I analyzed a convenience sample of aggregate data from a US-based, nationwide online child care training provider as a means for further investigating the ages, education levels, and occupations of individuals who are accessing this training, what such training "looks like," and on which topics the workforce is focusing. The study was set within a growing policy emphasis on child care workforce training as a means for improving the quality of child care and young children's development and early learning, as well as preexisting policies which require a minimal level of pre-service education and the completion of various amounts of in-service training and/or on specific topics. The study's results not only expand the field's understanding of workforce participation in online training, but also have implications for the extent to which such training is

likely to support policies aimed at improving child care quality and promoting young children's learning, as well as the topics to be addressed through future research.

Online training participants, offered training, and the workforce's training focus

As was highlighted in the study's results, an examination of course takers' demographics demonstrates that the online child care training does not appear to be solely favored by individuals of a specific age or education background. In fact, the reported education levels are similar to the US child care workforce statistics cited by Bassok et al. (2013). The age of the sample also appears to be fairly representative of the larger workforce (National Survey of Early Care and Education Workforce File 2012). This finding has important policy implications, as previous research (Stone-MacDonald and Douglass 2015; Thorpe et al. 2015; Weigel et al. 2012) regarding child care workforce participation in online training suggested that such participation might be limited to specific demographic groups.

Previous research also suggests the duration and intensity of training should match the content of what is being learned (Lauer et al. 2014; Winton et al. 2016; Zaslow et al. 2010). A second policy implication of this study is the majority of online training offered by this provider at the time of the study appears to reflect this research base. Specifically, the majority of 2016 offered courses were 1 h in duration and at the Beginner level. Furthermore, while the offered training spanned all eight CDA categories, most of the courses were related to 'Safe, healthy learning environment,' followed by 'Managing an effective program,' both of which tend to include courses on standardized, stand-alone or introductory topics. Conversely, individual training focused on 'Observing and Recording Children's Behavior' was limited to just three 1-h courses. Given that this a topic which can require a sequential approach to learning and thus potentially not be appropriate for a variety of 1-h stand-alone courses, access to just three courses may not necessarily be a bad thing.

These results also suggest the average number of annual per-person training hours ranged from 10 to 12, which is aligned with Linder et al.'s (2016) recent single-state research. While information on individuals' motivation for completing this quantity of training was not available, it appears to be in line with state child care licensing requirements, as well. Furthermore, courses related to 'Safe, healthy learning environment,' experienced the highest average relative participation rates. Given the emphasis on health and safety in state licensing and CCDF policies, it would seem that policies aimed at ensuring the workforce's participation in health and safety-related training appear to be achieving their goal.

In sum, these results provide a preliminary glimpse into the demographics of online course takers, the nature of offered online training, and trends in training participation. Yet, they also suggest some implications for the potential for online training to meet the workforce's in-service learning needs in response to policies aimed at improving young children's development and learning outcomes.

Potential for online training to meet all of the workforce's in-service learning needs

An overarching goal of this study was to expand the field's understanding of to what extent online learning might meet the child care workforce's training needs, particularly

within the context of policies aimed at expanding their capacity to support structural and process quality, as well as the research base on effective training. At the time of the study, the online training provider investigated here mainly offered an array of 1- to 2-h, beginner-level courses and in response to the state policy emphasis on completion of hourly quantities of training related to specific topics. And, many of the stand-alone or introductory topics addressed through these courses mirrored the research base on the potential effectiveness of short, single trainings (Byington et al. 2011; Kakietek et al. 2014; Moon and Oden 2003; Moon et al. 2008; Van Stan et al. 2013). Therefore, while there are limitations to this study (and discussed in more detail below), these results suggest that online training has the potential to provide widespread access to relatively short trainings related to structural quality subjects or as an introduction to a variety of more process quality-oriented topics.

However, additional child care policies focus on improving the workforce's capacity to support young children's development and learning outcomes. In this case, research suggests that single, 1- or 2-h beginner-level workshops are not adequate for teachers with minimal prior levels of knowledge about, or experience with, the focus of the training (Manning and Avery 2007; Moreno et al. 2015; Zaslow 2014). In fact, if the aim is to support the type of teacher–child interactions which are necessary for enhancing young children's early learning outcomes, additional research demonstrates that effective training requires intensive, sequential learning opportunities, as well as ongoing support and feedback (Early et al. 2017; Fabiano et al. 2013; Gerde et al. 2014; Hamre et al. 2012; Ota and Berghout Austin 2013; Pianta 2011; Pianta et al. 2014; Piasta et al. 2012; Yamauchi et al. 2013). In light of this research base, beginner-level online training appears to be less likely to support the aim of state and federal process quality-focused policies. Therefore, another potential issue for researchers and child care policymakers to consider is the availability of intermediate and advanced level training which aims to improve the workforce's teaching practices and children's learning, as well as what such training needs to cover content-wise when aimed at the non-degreed workforce.

To be fair, the online training provider which provided the aggregate data for this study does not claim to meet all of the US child care workforce's in-service learning needs. And, given the demographics of their typical consumer and what is known about the very low pay rates for US child care and even Head Start teachers (Barnett et al. 2016; Whitebook et al. 2014), it may not make sense from a business model perspective (Zott et al. 2011) for this specific provider to offer the type of intensive online training and other professional supports which are aimed at PreKindergarten teachers who already have a minimum of a Bachelor's degree (e.g., Cabell and Downer 2011; Downer et al. 2011; Lee et al. 2012; Kinzie et al. 2014; Pianta et al. 2008).

However, given the stark differences between these two ends of the research-based training continuum, a larger issue to be considered by US child care policymakers is to what extent training alone can effectively increase the workforce's knowledge and skills. As other researchers (Institute of Medicine and National Research Council 2012; Whitebook 2014) have pointed out, policies acknowledging the important role played by teachers in supporting young children's learning and development are well intentioned, but also at odds with the concurrent regulations which allow child care teachers to enter the field without any post-secondary education and instead emphasize the attainment

of limited hourly training. Exploring the solutions to this policy paradox is beyond the scope of this paper, but such an inquiry is critical for determining the potential for online or traditional classroom-based training to meet all of the birth to age 5 child care workforce's training needs.

Limitations of the study and implications for future research

The study reported on here is admittedly limited in that it relied on a convenience sample of training data provided by a single online provider. As a result, it is impossible to know to what extent these results are representative of all of the training accessed by the US child care workforce between 2010 and 2015. Access to more comprehensive data on the US child care workforce's completed training could be helpful for illuminating their training needs in terms of topics and intensity (e.g., 1-h beginner training versus multiple-hour intermediate or advanced courses). However, gathering and analyzing such data would admittedly be methodologically challenging due to the number of local and state child care resource and referral agencies, community colleges, state agencies, and other non- and for-profit organizations which provide training aimed at the birth to age 5 US child care workforce (Bromer and Weaver 2016; Cannon et al. 2016; Cox et al. 2015; National Association of Child Care Resource & Referral Agencies 2008).

Another key limitation is the nature of the data analyzed. As mentioned above, because the aggregate datasets analyzed were de-identified and decoupled from each other as a means for maximizing participant confidentiality, it was not possible to conduct complex, multivariable analyses. As a result, the data did not lend themselves to answering more in-depth questions about which individuals from which settings (e.g., infant and toddler versus preschool, child care versus Head Start, etc.), occupations (teacher versus administrator), or educational backgrounds (e.g., high school diploma versus some college or with a Bachelor's degree) undertook specific courses. I also was unable to determine the extent to which any course taker was a 'repeat customer' over the 5 years of data or even within a single year. In addition, the data analyzed did not provide the opportunity to examine course takers' motivation for taking any course.

It therefore also would be useful for future research to investigate which demographic and/or professional factors are related to individuals' decisions to access specific online courses. Of particular interest is the role played by their position, the in-person training to which they have access, and the ages of the children they serve. Also of interest is their rate of pay and ability to pay for required or elective training, and/or the sector or program in which they work and their respective policies, as such factors may be important to acknowledge if policies are to effectively result in participation in specific quality-related trainings.

Furthermore, these results suggest there is an existing model for beginner-focused, online child care training. However, I did not examine the content of any of these trainings, much less the effects on course taker knowledge and/or practice, and in turn, the effects on program structural quality or children's experiences in child care. It therefore would be helpful for future research to take a closer look at entry-level online courses and the extent to which their focus and duration are effective in this regard. Also of interest is course takers' perceptions of the extent to which a course improves their knowledge and/or skill.

Conclusions

This study provides a preliminary glimpse of the online training aimed at, and completed by the US child care workforce. The secondary analysis of the aggregate data used for the study suggests online training is being undertaken by individuals across the age and education spectrum. Although this is an encouraging finding, the majority of online training both offered and accessed at the time of the study appeared to be in response to policies aimed at meeting hourly- and health and safety-focused policies, rather than enhancing process quality. This finding is important given the concurrent policy emphasis on improving the capacity of the child care workforce to support the learning and development of the nation's young children.

To further understand the potential for online training to enhance the knowledge and skills of the US child care workforce, future research should focus on the extent to which beginner, intermediate, and more advanced training is available—and accessed—on an online versus traditional classroom basis, as well as what factors are contributing to individuals' decisions to access either training format. Also to be investigated is the content of online training courses and the extent to which these courses are effective at building on the workforce's knowledge and skills. A final area to be explored through future research is the capacity of online training to address all of the topics which are relevant to enhancing child care quality and improving young children's learning and development, especially in light of the research base on effective training. Such information will be useful for considering whether the policy context which drives the need for child care workforce training is sufficient for supporting its structural and process quality-related goals.

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