

*TMW-Early Childhood Educator Program (TMW-ECE)*

PROTOCOL TITLE: TMW-Early Childhood Educator Program (TMW-ECE)

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## **TMW-Early Childhood Educator Program (TMW-ECE)**

### **Introduction**

The TMW- Early Childhood Educator Program (*TMW-ECE*) is one of the interventions in the TMW Center's public health approach to impacting children's early cognitive and social-emotional development at a population level. The *TMW-ECE* intervention aims to impact educators' knowledge and beliefs about the importance of a rich early language environment in children's foundational brain development, and develop their skills for cultivating one in their classrooms and beyond. *TMW-ECE* will target early childhood educators through an online course where they will participate in eight online, self-directed modules. This study will evaluate the efficacy of the professional development intervention in increasing knowledge and promoting behaviors among educators that support critical language and cognitive development in young students ranging from infancy to preschool age. In order to evaluate the efficacy of the course, all participants will complete surveys regarding their knowledge, beliefs, and behaviors regarding childhood development and their involvement in the child's care. It will also provide information on how users interact with an online professional development format and inform future course iterations to improve the user experience. *TMW-ECE* will integrate education and technology into a scalable multimedia platform with the goal of broadening the reach of our earlier in-person programs.

### **Theoretical Background**

*TMW-ECE* is an extension and a focused adaptation of the TMW Center's suite of interventions, specifically developed for early childhood educators. *TMW-ECE* is grounded in three main bodies of literature and research. The first is research on early childhood language acquisition, child development, and child behavior. The foundation of our evidence-based curricula derives from the differences found in children's language environments, which largely depend on socio-economic status (Hart and Risley, 1995). Second is research on the potential that early childhood educators have to mitigate the development and achievement gaps that children from low-SES backgrounds experience (Piasta et al, 2012; Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Justice, Mashburn, Hamre, & Pianta, 2008). Third is research and data on the use of professional development programs as a way to maximize that potential and to improve and enrich the language learning environment of early childhood classrooms (Piasta et al, 2012). This project addresses a high priority topic for educators that has long-term implications for educational and achievement trajectories for low-SES children. Therefore, *TMW-ECE* aims to increase educator knowledge of early childhood language development and to identify the most effective way to translate this knowledge into behavioral change that will have lasting impact on their students. We aim to bring these bodies of research together to craft a public health intervention using existing TMW initiatives while also adding an important educational component.

### **Importance of Language Acquisition on Cognitive Development:**

A child's early language exposure is pivotal in language development and in ultimate educational and intellectual achievement (Bruner, 1981; Chapman, 2000; Gallaway & Richards, 1994; Hart & Risley, 1995; Huttenlocher, Haight, Bryk, Selzer, & Lyons, 1991; Rowe, 2008). Hart and Risley's landmark study demonstrated the tremendous impact of a child's early language milieu on future learning by revealing a significant correlation between the number of words a child is exposed to between ages 0-3 and his or her ultimate IQ and academic success (Hart & Risley, 1992; 1995). Their findings were both significant and alarming, demonstrating the critical and time-sensitive role that early language exposure plays in a child's life.

Hart and Risley's study revealed a steep socioeconomic gradient in early exposure to words and language, raising particular concern for children born into poverty. At the end of their third year, children from high socioeconomic status (SES) families heard approximately *forty-five million* words, while children from economically impoverished backgrounds heard only approximately *thirteen million*. Hart and Risley found that more talk equated to faster vocabulary growth and higher IQ test scores at three years and older. Their follow-up with these children at 9-10 years of age confirmed that school interventions came too late to alter these trajectories; the reverberations of early linguistic shortfall were likely to follow these children throughout their lives.

However, this research also demonstrates that the challenges these some children face are not a result of genetics nor lack of potential, and most importantly they are not unalterable. In fact, the aforementioned inequity can be mitigated with high quality early childhood educational interventions. Research has shown direct links between early childhood care quality and positive impacts on children's math and literacy skills as well as their intellectual, social, and behavioral development (Pinto et al., 2012; Howes et al., 2008; Mashburn, 2008), illustrating the necessity of an intervention aimed at early childhood educators.

#### *Impact of Early Childhood Education on Children's Development and Achievement*

Theory and research suggest that a large part of children's language development is contingent on both the quality and quantity of language and communicative acts to which they are exposed, and early childhood educators are key to exposing children to frequent, high quality interactions that help build their language skills (McDonald et al., 2015; Piasta et al., 2012; Pinto et al., 2013). Building these skills early is crucial to children's school readiness in kindergarten and beyond. In fact, children who enter kindergarten with underdeveloped literacy and language skills are more likely to exhibit difficulties in school performance in both the short term and long term compared to those whose skills are well-developed in early childhood (Justice et al., 2012). Additionally, while children's early literacy and language achievements are relatively fluid in early childhood, these skills become increasingly stable as children get older (Lonigan, Burgess, Anthony, & Barker, 1998), demonstrating the importance of early intervention.

This is especially important for children from disadvantaged backgrounds, who are at a higher risk for language difficulties, as evidence supports that there is a link between the language environment in the classroom and children's language development and growth (Piasta et al., 2012). While high quality early childhood education can propel children forward, studies have also shown that early childhood environments of poor quality can actually hinder or nullify any positive effects experienced from the quality of the child's home environment (Watamura et al., 2011; Pinto et al., 2012), illustrating the urgency of ensuring all children have access to high quality early education opportunities.

#### *A Participatory Model of Professional Development and Educational Intervention*

Research has shown that exposure to high quality professional development programs can have a positive impact on classroom practices of early childhood educators, particularly in areas of language and literacy (Piasta et al., 2015; Desimone, Porter, Garet, Yoon, & Birman, 2002; Piasta et al., 2012; Landry, Swank, Smith, Assel, & Gunnewig, 2006). Early childhood educator training typically occurs either in post-secondary educator preparation programs, or through professional development accessed while employed as a childcare provider (Illinois Board of Higher Education, 2018). Educators in early childcare centers have a wide range of formal education, from a high school diploma through graduate-level degrees (Whitehead, 2018) demonstrating a need for equally diverse and plentiful professional

development options. And yet evidence-based professional development programs for educators of young children is limited (IITQI, 2016).

Building off of this existing body of research, the *TMW-ECE* intervention seeks to create a participatory model of professional development that will inform teachers of child development that will, as a result, aim to improve and enrich their classroom environments. It will specifically target educators with less formal education (no more than a bachelor's degree) with the goal of filling in gaps that advanced-degree programs may have addressed. The intervention is currently being designed and planned with iterative participation and feedback from the audience we seek to have an impact on. Exploratory and formative qualitative research informs the intervention, drawing insights from early childhood care educators. Our intervention is being developed with focus groups and individual interviews with educators and visits to early childhood classrooms in Chicago that informed the creation of an online professional development program that is informative, engaging, and convenient for a busy educator to complete.

While earlier TMW interventions have been developed for parents, the *TMW-ECE* intervention will be tailored for educators. One advantage of *TMW-ECE* is the employment of an online platform to disseminate information to educators in various formats, allowing for a continuous flow of information. The program will include messages and strategies specifically for educators of children from birth to three years of age with a focus on the role of talk and interaction in children's brain development, strategies educators can use to support their students' brain development, and ways educators can share this knowledge with parents to maximize the impact on a child's learning.

#### *The significance of the Early Childhood Educator Program as a Public Health Initiative*

*TMW-ECE* is a public health effort to raise awareness about the critical importance of early childhood language development. For the intervention, *TMW-ECE* will be hosted on an online learning management system (LMS) where educators will complete the eight modules. If successful, we aim to scale the *TMW-ECE* Initiative to the national level so that the professional development program will be available for early childhood educators to complete nationwide. As a public health approach to disparities in early language environments, cognitive development, and later school readiness, *TMW-ECE* offers the potential for the development of a new standard of care in early childhood education.

#### Purpose

Through evidence-based strategies, the *TMW-ECE* program teaches educators how to harness the power of their words to build their students' brains and impact their students' learning trajectory. The purpose of the proposed study is to determine the efficacy of an eight-module interactive, online multi-media professional development course on our target population: individuals over the age of 18, who have no more than a bachelor's degree, and are employed as early childhood educators of children between the ages of 0 and 3. Outcomes of interest include changing caregiver knowledge and beliefs about child development, and encouraging the use of strategies provided to strengthen early learning environments. We will also measure how participants interact with the online course in order to determine which features help and hinder the online professional development process.

We hypothesize that the *TMW-ECE* intervention will be effective in improving educator beliefs and knowledge of their role in children's foundational brain development, and increasing the frequency of behaviors that are known to support children's language and cognitive development among our target population. The hypothesis relies on the existing research supporting the idea that educator understanding and beliefs will alter educator behavior.

We propose a two-cohort design randomized-controlled trial to evaluate the efficacy of the *TMW-ECE* program in positively impacting the knowledge and beliefs of less-educated caregivers (those with no more than a bachelor's degree). The *TMW-ECE* program will constitute the treatment arm of the study (Cohort A) which will complete the multi-media online professional development course beginning Summer 2019. Cohort B will be the control group, which initially does not view any modules but completes the surveys at the same intervals as treatment arm participants. After completion of the final survey measure, Cohort B participants will be offered the opportunity to review a revised version of the professional development course when it has been updated based on the findings of this study.

## **Protocol**

### ***Study Timeline:***

Each participant will be involved in the study for approximately 6 months. An outline of the study timeline is included on the following page

#### **Phase 1: Pre-Intervention**

Participant completes a demographics survey on RedCap to determine eligibility based on the exclusion criteria listed below. If they are eligible and desire to participate, they will complete the informed consent process online prior to beginning the intervention.

Upon signing the consent form, participants will be randomized into either the treatment or control group after providing their consent. All participants will be notified via email with detailed instructions on how to complete the study measures online and, if treatment group, how to view the modules.

Survey Session 1: Participant completes the following surveys online: SPEAK, Course Content Survey, and TOI.

#### **Phase 2: Intervention**

Participants in the treatment group complete interactive modules. They will be asked to complete one module per week, for a total of eight weeks.

Participants in the control group will have no active study requirements for the eight weeks following Survey Session 1.

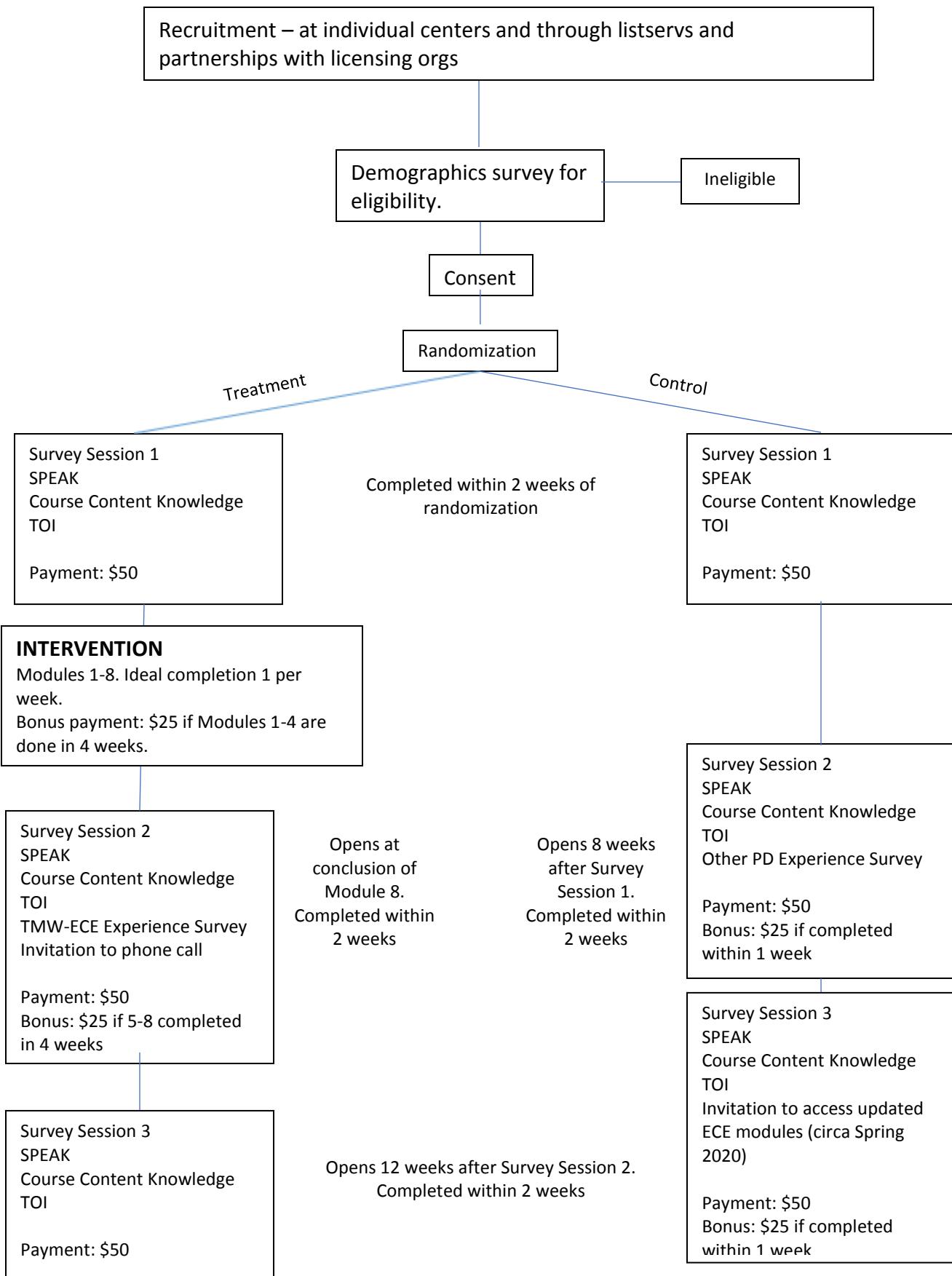
#### **Phase 3: Post-Intervention**

Upon completion of Module 8, participants in the treatment group will be invited by email to complete Survey Session 2, which includes the following surveys: Speak, TOI, Course Content Knowledge, and the qualitative Course Experience survey.

Participants in the control group will be invited to complete Survey Session 2 exactly eight weeks after they complete Survey Session 1, which corresponds to how long we anticipate treatment group participants needing to complete the 8 modules. This Survey Session will include the same surveys as the treatment group: SPEAK, TOI, Course Content Knowledge, and a qualitative Course Experience survey on their most recent professional development.

All participants in both experimental groups will be invited by email to complete Survey Session 3 exactly 12 weeks after the completion of Survey Session 2. Surveys include: SPEAK, Course Content Knowledge, and TOI.

At the conclusion of the study, participants in the treatment group may be asked to participate in a phone interview about their experience with the program, their opinions on the curriculum, and how they interact with the children in their care. This interview will be conducted with a trained member of the research team.



### Participants

We plan to recruit up to 600 early childhood educators with no more than a bachelor's degree who are employed to teach students between the ages of 0 and 3 years old. These participants will be randomly assigned to a condition after the completion of a demographics screening survey and granting of informed consent. All educators will be allocated to one of the two experimental conditions: the treatment group (Cohort A) will complete the 8 modules during the duration of the 6-month study. The control group (Cohort B) will not complete the 8 modules as part of their participation in the study. However, they will be given the option to access the revised professional development course when it is adapted based on the study's findings. Each group will consist of approximately 300 participants.

### Exclusion criteria

Exclusion criteria are as follows:

- Educators who report having a higher level of education (above a bachelor's degree, including any graduate school coursework).
- Educators who do not work with children ages 0-3 as their primary age group.
- Educators who are under the age of 18.
- Educators who do not have access to a computer or tablet with access to the internet.
- Anyone not employed by a childcare program (either home or center-based).
- Anyone whose role within a childcare setting is not that of an educator (primary teacher or assistant teacher)

### Recruitment:

To reach our target population of early childhood educators with no more than a bachelor's degree, we intend to recruit through the following channels:

- licensing agencies (INCCRRA, NAEYC, ilaeyc, IAFC)
- large childcare centers/provider networks (IL Action for Children, Chicago Commons, Kindercare, Early HeadStart)
- Early childhood degree programs (City Colleges of Chicago AA, DePaul/UIC BS)

By working with agencies, providers, and institutions who have contact with a large number of early childhood educators, we hope to gain access to listservs and newsletters that can help us reach interested participants. Partner organizations will be given some background information on the TMW Center and our work, the professional development course, and study goals (attached). They will be asked to share only a recruitment flyer (attached), however, so as not to risk spreading the content of the program and contaminating participants prior to the study's start.

### Consent

All participants will be asked to read and electronically sign an Informed Consent Form via the online platform, RedCap. They will have access to an electronic copy of the consent form. We will ask permission to obtain contact information including name, address, telephone and email in order to contact subjects to complete follow-up surveys. Participants and the research staff will have access to the electronic consent document throughout the duration of the study. This will take place before the participant completes the first module of *TMW-ECE* or completing surveys (with the exception of the demographic survey, which will be completed as an eligibility screener prior to being shown the consent document). So that Dr. Suskind or her research team may contact the participants in the future, we will

request consent to keep contact information from this study (name, address, phone number, and email address) in a password-protected database.

#### Randomization

We will use the website Research Randomizer ([randomizer.org](http://randomizer.org)) to generate a randomization table. In an Excel spreadsheet, the first half of the dummy number set will be assigned evenly to the Treatment condition (arm 1) and the other half will be assigned evenly to the Control condition (arm 2). Then, the data in the columns “participant,” “condition,” and “dummy” will be sorted using the Excel “Sort by” function on the column “dummy”. The participant numbers are now unsorted and randomly assigned to either one of the two experimental conditions: Treatment or Control. This will allow us to ensure equal sample sizes for all treatment and control conditions.

#### **Description of LMS:**

This course will be delivered via an online learning management system (LMS) that helps create, manage, and deliver eLearning courses. For this study, the LMS will be the method through which study participants will complete the *TMW-ECE* professional development course. The LMS will host all eight modules of the program, and users will complete each module on the LMS. As the participants work through the modules, the LMS will record how the participants interact with the program, and this information can then be downloaded in the form of reports to analyze the effectiveness of the intervention. Examples of these reports include how long participants spend on a certain slide, which answers they selected for survey questions, and what scores they achieved on quizzes.

The LMS will be reviewed for compliance with security requirements and protection of user rights. Each user will be given a unique log-in to a password protected account, and no one from the LMS company will be able to access user data unless granted permission for assistance with a technology related problem. Members of the research team will be able to access participant data through a password protected account.

#### **The Professional Development Course:**

TMW’s approach to fostering a rich early language environment centers around the **3Ts: Tune In, Talk More, and Take Turns.** *TMW-ECE* is an eight-module course that demonstrates ways that caregivers can use this approach to enrich the talk and interaction in their classrooms and maximize their children’s foundational brain development. The course explores how the 3Ts support early literacy and math instruction, as well as social emotional development and classroom management. A course outline is attached.

#### Study Incentives

Educators who complete the entire study will receive at least \$150 and up to a total of \$200. These payments will be issued in the form of an electronic gift card sent via the participant’s provided email address.

Payments will be given according to the following schedule:

\$50 upon completion of Survey Session 1

\$50 upon completion of Survey Session 2

\$50 upon completion of Survey Session 3.

In addition, participants will be eligible to receive up to \$50 in bonus gift cards for completing study milestones on or ahead of schedule. Because the program is self-paced with little interaction from the researchers, we believe that offering these incentives is crucial to keeping participants in adherence to the study protocol and designated 6-month timeline.

The Treatment Group will receive \$25 for completing Modules 1-4 within 4 weeks and an additional \$25 for finishing Modules 5-8 within 4 more weeks.

The Control Group will receive \$25 for completing Survey Session 2 within 1 week of being notified that it is available online, and an additional \$25 for completing Survey Session 3 within 1 week of being notified that it is available on time.

Participants who complete all 8 modules of the online professional development, whether as part of the treatment condition of the study or following study completion for the control group, will have the option of submitting their information to the Illinois Network of Child Care Resource and Referral Agencies (INCCRRA) for professional development credit hours through the statewide Gateways to Opportunity program. We will obtain permission to share their information, including their name, license number, and information about dates of completion of the program, with INCCRRA at the conclusion of the study for any participant who wishes to opt in to receive this credit.

### **Risks and Benefits of Participation**

Due to the educational nature of this study, risks are minimal, relating mostly to potential loss of confidentiality. The program is administered and access online, and involves completing surveys, providing demographic information, and (for the treatment group) completing eight modules of a professional development program. The data will be stored in password-protected computers and stored in locked file cabinets. Benefits include possible increased knowledge of the importance of early childhood language for cognitive development as well as the chance to provide feedback to TMW staff on the content and quality of the program.

### **Analysis**

Paired t-tests will be used to analyze total survey scores before and after intervention. Qualitative data will be used to make changes to the curriculum or module delivery format for future iterations of the program.

### **Description of Measures**

*The following scales, assessments, and questionnaires will be used throughout the course of the study.*

***Survey of Parental/Provider Expectations And Knowledge (SPEAK).*** The SPEAK is a questionnaire that assesses understanding of children's learning process.

***Theories of Intelligence:*** The TOI assesses a caregiver's theories about intelligence for children. It asks questions about what an individual thinks a child will be able to do, and whether their abilities are malleable over time.

***Course Content Knowledge:*** This survey includes questions specific to the course content conveyed in the professional development modules. True/false, and multiple-choice questions will measure participants' uptake of course material.

***Experience survey:*** This survey asks about providers' experiences with the online professional development program format, including ease of use, opinions about the quality of the curriculum, suggestions for how the program can be improved in the future, and how providers have used what they learned in the curriculum in their own classroom.

### **Confidentiality and Data Sharing**

The raw data will only be made available to the PI and trained study personnel listed on the protocol. Participant records will be identified with unique coded identifiers in order to protect confidentiality. Identifiable information, including name, telephone number, and email address will be stored on password-protected computers and access to which will be limited. Survey participants' names will be replaced with numerical codes such that survey scores will not be attached directly to the participants' contact information in order to protect anonymity. The data will be carefully monitored to protect patient privacy. All paper data will be stored in a locked cabinet in a locked office with access allowed only to researchers affiliated with the project.

Participant information may be shared with INCCRRA in order for participants to obtain Gateways credit for their participation in the course. Permission for this will be obtained at the conclusion of the study.

### **References**

- Bruner, J. (1981). Under five in Britain. *Research in Education*, 25, 47-59.
- Campbell, F.A., Pungello, E.P., Miller-Johnson, S., Burchinal, M., & Ramey, C.T. (2001). The development of cognitive and academic abilities: Growth curves from an early childhood educational experiment. *Developmental Psychology*, 37, 231-242.
- Chapman, R.S. (2000). Children's language learning: An interactionist perspective. *Journal of Child Psychology and Psychiatry and Allied Disabilities*, 41, 33-54.
- Desimone, L. M., Porter, A. C., Garet, M. S., Yoon, K. S., & Birman, B. F. (2002). Effects of professional development on teachers' instruction: Results from a three-year longitudinal study. *Educational Evaluation and Policy Analysis*, 24, 81–112.
- Gallaway, C., & Richards, B.J. (1994). *Input and interaction in language acquisition*. New York, NY: Cambridge University Press.
- Hart, B., & Risley, T. (1992). American parenting of language-learning children: Persisting differences in family-child interactions observed in natural home environments. *Developmental Psychology*, 28(6), 1096-1105.
- Hart, B., & Risley, T. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brookes Publishing Co.
- Howes, C., Burchinal, M., Pianta, R., Bryant, D., Early, D., Clifford, R. M., et al. (2008). Ready to learn? Children's pre-academic achievement in pre-kindergarten programs. *Early Childhood Research Quarterly*, 23, 27–50.
- Huttenlocher, J., Haight, W., Bryk, A., Seltzer, M., & Lyons, T. (1991). Early vocabulary growth: Relation to language input and gender. *Developmental Psychology*, 27(2), 236-248.
- Illinois Board of Higher Education. (2018). *The college enrollment and completion patters of Gateways Credential holders*. Springfield, IL: Author.

Illinois Infant Toddler Teacher Quality Initiative (IITQI) Task Force. (2016). *Illinois Infant Toddler Teacher Quality Initiative Task Force Policy Recommendations*, Bloomington, IL: INCCRRA

Justice, L.M., Mashburn, A., Hamre, B., & Pianta, R. (2008). Quality of language and literacy instruction in preschool classrooms serving at-risk pupils. *Early Childhood Research Quarterly*, 23, 51-68.

Landry, S. H., Swank, P. R., Smith, K. E., Assel, M. A., & Gunnewig, S. B. (2006). Enhancing early literacy skills for preschool children: Bringing a professional development model to scale. *Journal of Learning Disabilities*, 39, 306–324.

Lonigan, C.J., Burgess, S.R., Anthony, J.L., & Barker, T.A. (1998). Development of phonological sensitivity in two- to five-year-old children. *Journal of Educational Psychology*, 90, 294–311.

Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D., et al. (2008). Measures of classroom quality in prekindergarten and children' development of academic, language, and social skills. *Child Development*, 79(3), 732–749.

McDonald, D., Proctor, P., Gill, W., Heaven, S., Marr, J., & Young, J. (2015). Increasing early childhood educators' use of communication facilitating and language-modeling strategies: Brief speech and language therapy training. *Child Language Teaching and Therapy*, 31(3), 305-322.

Piasta, S. B., Logan, J. A. R., Pelatti, C. Y., Capps, J. L., & Petrill, S. A. (2015). Professional development for early childhood educators: Efforts to improve math and science learning opportunities in early childhood classrooms. *Journal of Educational Psychology*, 107(2), 407-422.

Piasta, S. B., Justice, L. M., Cabell, S. Q., Wiggins, A. K., Turnbull, K. P.,& Curenton, S. M. (2012). Impact of professional development on preschool teachers' conversational responsivity and children's linguistic productivity and complexity. *Early Childhood Research Quarterly*, 27, 387–400.

Pinto, A., Pessanha, M., and Aguair, C. (2012) Effects of home environment and center-based child care quality on children's language, communication, and literacy outcomes. *Early Childhood Research Quarterly*, 28, 94–101.

Rowe, M.L. (2008). Child-directed speech: Relation to socioeconomic status, knowledge of child development and child vocabulary skill. *Journal of Child Language*, 35, 185-205.

Watamura, S. E., Phillips, D. A., Morrissey, T. W., McCartney, K., & Bub, K. (2011). Double jeopardy: Poorer social-emotional outcomes for children in the NICHD SECCYD experiencing home and child-care environments that confer risk. *Child Development*, 82, 48–65.

Whitehead, J. (2018). *Illinois' Early Childhood Workforce 2017 Report*. Bloomington, IL: INCCRRA.