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# Evidence-informed in-service professional development to support KEIS providers' sustained fidelity to caregiver coaching.

Serena J. Wheeler
*University of Louisville*

# EVIDENCE-INFORMED IN-SERVICE PROFESSIONAL DEVELOPMENT TO SUPPORT KEIS PROVIDERS' SUSTAINED FIDELITY TO CAREGIVER COACHING

By

Serena J. Wheeler
AA, Lindsey Wilson College, 1990
BA, Lindsey Wilson College, 1991
MAE, Western Kentucky University, 2004

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# EVIDENCE-INFORMED IN-SERVICE PROFESSIONAL DEVELOPMENT TO SUPPORT KEIS PROVIDERS' SUSTAINED FIDELITY TO CAREGIVER COACHING

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Serena Wheeler

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By the following Dissertation Committee

_____
Dr. Scott Tomchek

_____
Dr. Ginevra Courtade

_____
Dr. Jason Immekus

_____
Dr. Jessica Hardy

DEDICATION

This dissertation is dedicated to my family

Mr. David Wheeler

Mr. Nicholas Wheeler

Mrs. Kaitlin Wheeler Riley

Mr. Andrew Riley

Ms. Marcia Freels


for their ongoing love and support

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I'm excited to acknowledge those who motivated and supported me to pursue a PhD. The families of infants and toddlers I served in my early intervention practice inspired me to embrace capacity-building practices. My colleagues modeled the many ways families, providers, students, and others could be supported with collaboration. Lastly, my mentors challenged me to think differently and on a larger scale for greater impact.

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ABSTRACT

EVIDENCE-INFORMED IN-SERVICE PROFESSIONAL
DEVELOPMENT TO SUPPORT KEIS PROVIDERS' SUSTAINED
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Part C early intervention (EI) providers are expected to implement family-centered, capacity-building practices with the increasing number of caregivers of eligible infants and toddlers with or at risk of developmental delays or disabilities. There is a current knowledge to practice gap in service provision, establishing the need for evidence-informed professional development. The Coaching in Early Intervention Training and Mentorship Program (CEITMP) was developed to expand the professional knowledge and skills of Kentucky's cross-disciplinary (i.e., developmental interventionists, occupational therapists, physical therapists, and speech-language pathologists) EI providers to coach caregivers to promote their increased confidence and competence to support their child's development and learning. The CEITMP embedded adult learning principles and included professional development specialists' supporting training and mentorship for EI providers over a 32-week period by introducing and illustrating strength-based caregiver coaching, offering performance feedback on providers' video recorded EI visits and self-assessments, facilitating collaborative teaming, and providing

follow-up to support sustained fidelity to caregiver coaching practices. Active

Implementation Frameworks were applied to retrospectively investigate

implementation and intervention data from the first four years of the statewide,

multi-component training and mentorship program. Results indicated the CEITMP

was implemented with good fidelity and was key in supporting EI providers to

complete the program successfully; EI providers demonstrated the ability to use

and sustain caregiver coaching with fidelity; and aggregate state data showed

positive child and family outcomes. These results emphasize the significance of

ensuring both intervention and implementation fidelity to promote intended

outcomes.

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CHAPTER 1 INTRODUCTION

A caregiver capacity-building approach is endorsed (Bruder, 2010; Dunst & Trivette, 2009; Romano & Schnurr, 2022) for families of children birth to three, who have or are at risk of developmental delays or disabilities, receiving early intervention (EI) services through Part C of the Individuals with Disabilities Education Act (IDEA, 2004). Capacity-building practices are designed to support caregivers to capitalize on everyday opportunities in their natural environments to help their children develop and learn (Swanson et al., 2011). However, cross-disciplinary providers, such as developmental interventionists (DI), occupational therapists (OT), physical therapists (PT), and speech-language pathologists (SLP), representing a variety of pre-service training programs, often deliver services directly to children using traditional therapy models (e.g., special instruction and therapy; Bruder et al., 2021; Krick Oborn & Johnson, 2015; Marturana & Woods, 2012; Raab & Dunst, 2004). Given one day workshops and webinars are ineffective yet remain the most used methods of training in-service EI personnel on effective practice models (Bruder et al., 2021; Krick Oborn & Johnson, 2015; Odom., 2009; Snyder et al., 2011), high-quality professional development (PD) with embedded adult learning methods can be employed to support diverse EI providers to refine and align their practices (Bruder et al.,

2009; Dunst et al., 2015; Marturana & Woods, 2012) with recommended approaches.

Implementation science is concerned with understanding the many factors associated with evidence-based practices (EBPs; Dunst et al., 2013), including the adoption and integration of the practices (Eccles et al., 2009) in everyday contexts with high fidelity (Barton & Fettig, 2013) and ultimately the long-term sustainability of practice implementation (Fixsen et al., 2005). Implementation is the "tie that binds" an EBP to positive outcomes for young children and their families (Odom, 2009), meaning high fidelity of implementation combined with high fidelity of intervention practices, increases the likelihood of the intended effect - positive outcomes (Barton & Fettig, 2013; Dunst et al., 2013; Fixsen et al., 2005).

Active implementation frameworks (AIF; National Implementation Research Network, 2022a), derived from implementation science theory, focus on enabling contexts for intervention and implementation fidelity and serve as a guide for systems' improvement by promoting sustainable EBPs to achieve intended outcomes. I applied AIF to early intervention systems (EIS) to retrospectively investigate implementation and intervention data from Kentucky Early Intervention System (KEIS) providers measuring sustained caregiver coaching skills before, during, and after participating in an evidence-informed, high-intensity training and mentorship PD program. I also explored the implementation team's fidelity to administering the PD program. Additionally, KEIS annual state performance plan/annual performance report (SPP/APR) data

provided context for the study.

**Background**

  EI programs were established in 1986 under Part H of what is now Part C of IDEA (Individuals with Disabilities Education Act, 2004), to address the needs of eligible infants and toddlers at risk of, or with delays and disabilities, ages birth through two years, and their families. Congress initially launched the Part C program to enhance the development of young children; reduce the need for costly, long term special education services; maximize opportunities for independent living; and build the capacity of families to meet their child's needs (Early Childhood Technical Assistance Center, 2022). Eligibility criteria for enrollment in the federally and state funded program is determined by individual states and based upon evaluation by a multi-disciplinary team (Individuals with Disabilities Education Act, 2004). Part C supports, intended to be initiated as early as possible, are designed around the child's identified needs in one or more developmental areas: physical (motor), cognitive, communication, social or emotional, and adaptive. Family needs are also linked to evaluation findings, as they are foundational to intervention planning in EI.

  Cultivated from IDEA and grounded research, the Mission and Key Principles for Providing EI Services in Natural Environments (Workgroup on Principles and Practices in Natural Environments, 2008), the Division for Early Childhood Recommended Practices (DEC RPs; 2014), and Initial Practice-Based Professional Standards for Early Interventionists/Early Childhood Special Educators 2020 (The Council for Exceptional Children and The Division for Early

Childhood, 2020) [hereafter, referred to as the EI/ECSE Standards], guide early intervention/early childhood special education (EI/ECSE) professionals' preparation and practices. Pre-service and in-service training includes using EBPs to promote positive child and family outcomes (Campbell & Sawyer, 2009; Odom, 2009). The mission for providing EI services focuses on building the capacity of caregivers to support their child's learning and development during everyday routines; and the key principles reflect the foundational, high-quality, family-centered services and supports of the EI system. The DEC RPs offer guidance to practitioners and stakeholders about the most effective ways to advance outcomes for young children with developmental differences, ages birth through 5 years, and their families. Further, the EI/ECSE Standards underscore the specialized knowledge and skills needed to work with young children with delays and disabilities and their families. These widely accepted guidance documents not only inform practice, but serve as frameworks for EI/ECSE workforce development PD.

Part C is a complex workforce system, operated independently in each state, with multiple professional and paraprofessional disciplines represented (Bruder et al., 2021). EI personnel needs are intensifying nationwide with the growing number of infants and toddlers with or at risk for developmental delays and disabilities receiving services (U.S. Department of Education, 2020). The effectiveness of the workforce is currently limited by inconsistent requirements for certification/licensure; shortages of preservice early childhood intervention programs in IHE; growing gaps in practitioners' knowledge and use of EBPs with

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fidelity; high turnover in administration; and a lack of effective PD including the absence of systems to recruit, train, support, and sustain provider competency (Bruder et al., 2021; Krick Osborn & Johnson, 2015). EI providers often work with little to no supervision (Chen et al., 2008), and frequently provide services using approaches with which they are familiar, or the family expects, such as working directly with children with an emphasis on addressing delays and child developmental milestones (Campbell & Sawyer, 2009; Odom, 2009).

Comprehensive systems of personnel development (CSPD) are needed to build a competent EI/ECSE workforce (Bruder et al., 2021). Well-designed PD is critical to address the requisite knowledge and skills of practitioners to implement recommended practices (Campbell & Sawyer, 2009; The Council for Exceptional Children and the Division for Early Childhood, 2020). Although single day workshops remain a common attempt to strengthen the knowledge and skills of practitioners, minimal change in practice is typically observed with the approach (Krick Osborn & Johnson, 2015; Snyder et al., 2011). Research-based components of PD built on adult learning principles have been associated with positive practitioner outcomes (Bruder et al., 2009; Campbell & Sawyer, 2009; Dunst et al., 2015; Snyder et al., 2011). Additionally, greater integration of these individual research-based components (i.e., active learner participation, trainer guided learning opportunities for reflection and practice, clear objectives, information about skills, modeling, feedback, sufficient duration and intensity, and follow up coaching) yield greater PD effects (Dunst & Trivette, 2009; Dunst et al., 2015), with the key component of coaching (Snyder et al., 2011) and

performance feedback (Krick Osborn & Johnson, 2015) resulting in significant changes in providers' practice.

**Problem Statement, Purpose, and Research Questions**

Given the expectation that Part C providers will implement evidence-based, capacity-building practices with the increasing number of caregivers of eligible infants and toddlers with or at risk of developmental delays or disabilities, there is a need for evidence-informed PD to address the knowledge to practice gap in service provision. Kentucky's Coaching in Early Intervention Training and Mentorship Program (CEITMP; 2022a), built on the above adult learning methods and best PD practices, sought to expand the professional knowledge and skills of KEIS providers to promote caregivers' confidence and competence to support their child's development and learning.

The purpose of this retrospective study was to investigate KEIS providers' sustained intervention fidelity to caregiver coaching practices according to the Kentucky Coaching Adherence Rubric-Revised (KCAR-R; Coaching in Early Intervention Training and Mentorship Program, 2022b); and professional development specialists' (PDSs) implementation fidelity to a mandatory, evidence-informed, multi-component PD program as part of KEIS's State Systemic Improvement Plan (SSIP) designed to promote positive outcomes for children and families. My research questions are:

1. What changes are there in caregiver coaching skills as measured by the KCAR-R across baseline, immediately following high-intensity training and

mentorship, and first maintenance period assessment markers for KEIS providers who completed the CEITMP?

2. What differences are there in KEIS providers' fidelity to a defined set of caregiver coaching skills measured by the KCAR-R based on characteristics of discipline, years' experience, cohort, and launch group at baseline, immediately following high-intensity training and mentorship, and first maintenance period assessment markers?

3. What differences are there in KEIS providers' sustained caregiver coaching skills as measured by the KCAR-R on their initial maintenance period submission based on engagement in recommended, optional preparatory activities of attending a maintenance refresher group meeting, viewing videos in the exemplar library, both, or no engagement?

4. What differences are there in KEIS providers' sustained caregiver coaching skills as measured by the KCAR-R on their initial maintenance period submission based on the length of time that occurred following their completion of the CEITMP (i.e., 2-4 months, 5-8 months, 9 months, 12, months, 18 months)?

5. What degree of fidelity did PDSs implement the CEITMP with providers in cohorts 11-16?

6. What levels of assistance/flexibility did PDSs use to support EI provider successful completion of the CEITMP?

**Study Significance**

This study presented a unique opportunity to investigate the implementation of a real-world, statewide PD program for EI providers using an implementation science lens. The CEITMP was designed to support active cross-disciplinary providers to use and maintain caregiver coaching strategies with fidelity to increase caregivers' self-perception of their ability to help their child develop and learn. This work contributed to the EI systems' change literature related to improving provider practice by reporting on both intervention and implementation fidelity, aggregate KEIS SPP/APR family and child outcomes, maintenance data, and providing an example of transitioning research-based practices to the field. The results of this study will inform future CEITMP modifications to support KEIS providers to maintain fidelity to caregiver coaching practices. Furthermore, the findings of this study will also contribute to the KEIS state leadership team and work group as they develop processes and seek legislative approval to institute a tiered rate reimbursement system for EI providers, with a higher rate of pay assigned to providers demonstrating effective, evidence-informed services, such as sustained caregiver coaching, with fidelity.

CHAPTER 2 LITERATURE REVIEW

In this chapter I reviewed literature on the combination of sustained effective practices, effective implementation, and enabling contexts to promote positive outcomes framed by implementation science theory and AIF. Initially, I provided an overview of implementation science and AIF as the theoretical foundation for this study. I then reviewed effective implementation and sustained intervention practices and included a summation of enabling contexts. These reviews grounded the exploration of evidence-informed PD implementation to promote EI providers' adoption and sustained use of a caregiver coaching intervention, an EBP to promote positive child and family outcomes, such as increased caregiver capacity to support their child's learning and development.

**Implementation Science**

Developed in the health care field in the 1970s, implementation science is a newer area of study that arose in response to medical professionals not basing their practices on scientific evidence (Odom et al., 2020). Similarly, it emerged in the field of education in the 1980s as a result of a noted research to practice gap and need for evidence-based educational practices (Odom et. al., 2020). Presently, the science of implementation is used by a variety of practitioners, researchers, and policymakers, spanning disciplines in human services, juvenile

justice, education, medicine, business, agriculture, engineering, manufacturing, and marketing fields (Fixsen et al., 2005).

Fixsen and colleagues (2005) defined implementation as a "specified set of activities designed to put into practice an activity or program of known dimensions" (p. 5). Implementation science is the examination of how innovations based on or informed by evidence get transferred to different contexts outside of research settings and has been defined as the "scientific investigation of factors associated with effective implementation" (Franks & Schroeder, 2013, p. 7). Focused on improvement and seeking to narrow the gap between what we know and what we do, implementation science is concerned with the system level components that facilitate the uptake and sustained integration of evidence-based or evidence-informed practices with fidelity to increase the likelihood of intended outcomes (Fixsen et. al., 2005; Franks & Schroeder, 2013).

The terms fidelity, adherence, and integrity are often used interchangeably in the EI/ECSE literature to discuss evaluation of practices (Barton & Fettig, 2013; Dunst et al., 2013). Consistent and clear definitions are essential in ensuring shared understanding of terminology (Barton & Fettig, 2013; Odom, 2009). Dane and Schneider (1998) used the word integrity to refer to the degree to which identified procedures are implemented as intended, and Dunst and colleagues' (2013) definition of fidelity focused on using the key characteristics of an EBP as a result of what was learned from research about the relationship between the characteristics and outcomes of the practice. In this paper, the term fidelity refers to the degree to which an evidence-based/informed practice is

adhered to as intended, applicable to an implementation, intervention, innovation practice, and/or program.

Research shows that fidelity to intervention practices based on evidence is linked to intended outcomes, and the process of implementation measured by checklists is associated with fidelity, resulting in programs having a greater probability of efficacy (Barton & Fettig, 2013; Durlak & DuPre, 2008; Fixsen et al., 2005). However, a lag time of 20 or more years has been reported for practices deemed effective in research settings to translate to real-world settings (Franks & Schroeder, 2013). The knowledge to practice gap is immensely important in early childhood education, as high-quality early childhood programming is known to lead to positive developmental outcomes (Franks & Schroeder, 2013). Although evaluation studies have incorporated elements of implementation science (Barton & Fettig, 2013), little research specific to early childhood education with an implementation science lens has been conducted (Franks & Schroeder, 2013).

Franks and Schroeder (2013) outlined seven key themes spanning the literature which provide a foundational understanding of implementation science: (1) initial efforts should focus on assessing system, organization, or program's needs, readiness, and capacity for change to ensure a good fit; (2) leadership and representative stakeholder engagement is critical from the onset to promote buy-in; (3) deliberate efforts to share the structure for the implementation process should be made prior to initiating any change; (4) processes to build learners' knowledge and skills around the innovation or practice, including recognition of

preservice knowledge is needed; (5) data systems to monitor fidelity and evaluate intended outcomes are imperative; (6) strategies to obtain continuous feedback to improve processes is essential; and (7) considerations for adapting the innovation to fit within the intended contexts while retaining its integrity is important. These key themes can be used to frame program and service implementation.

Science-based implementation frameworks constructed with stages of implementation and core components can improve outcomes and support replicating effective programs and systems. Implementation science must focus on the fidelity to the practice or innovation but also the system level components that support quality implementation, continuous improvement, and sustainability. To transition to active implementation, a well-operationalized innovation, practice, or model is fundamental.

**Active Implementation Frameworks**

Researchers highlight how implementation science outcomes are influenced by the lack of common terminology and organized approaches (Fixsen et. al., 2005; Fixsen et. al., 2021). They advocate for a generalizable framework that can be used and understood across fields and disciplines. AIF were created from synthesized research findings based on the evidence of practitioners and researchers involved in organization and systems' change, program development, successful use of innovations, and intentional use of the implementation components in practice (Fixsen et al., 2021). Focused on the integration of effective interventions, effective implementation, and enabling

contexts to promote socially significant outcomes (National Implementation

Research Network, 2022a), the five overarching frameworks of AIF (Figure 1)

are: (1) usable innovations, (2) implementation drivers, (3) implementation

teams, (4) implementation stages, and (5) improvement cycles. I briefly reviewed

**Figure 1**

*Active Implementation Frameworks*
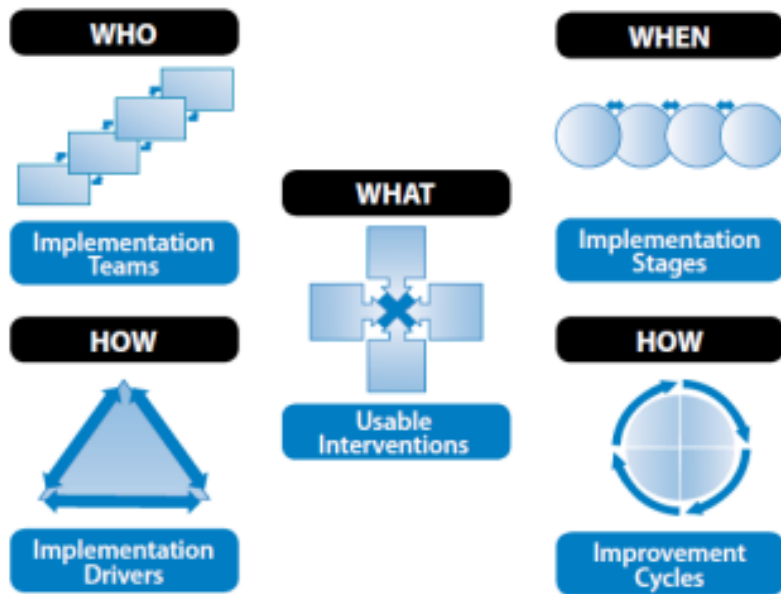


*Note:* Active Implementation Frameworks. From "National Implementation Research Network, University of North Carolina at Chapel Hill, 2022. Used with permission."

each framework and link to KEIS' state systemic improvement plan (SSIP) efforts

and summarized in Table 1.

**Table 1**

*AIF Linked to KEIS's Systems Change Efforts*

| AIF | KEIS's Systems Change Effort |
| --- | --- |
| Usable Innovation | A capacity-building, caregiver coaching approach to support KEIS eligible families to help their children develop and learn |

| | |
|---|---|
| Implementation Drivers | **Leadership Drivers**<br>−SLA team<br>−SSIP team (i.e., POE Managers, CEITMP team, SLA team)<br>−OSEP and TA teams<br><br>**Competency Drivers**<br>−Selection and training of implementation team<br>−CEITMP development<br>−KCAR-R development<br><br>**Organizational Drivers**<br>−Facilitative administration: SLA team<br>−Systems intervention: SSIP and SLA Teams<br>−Data-based decision making: SLA and CEITMP teams via annual SPP/APR/SSIP data and KCAR-R scores |
| Implementation Teams | **District Implementation Team**<br>−POE manager<br>−POE staff (SC, support staff, DCES)<br>−KEIS providers<br>−PDS liaison from CEITMP<br><br>**SSIP Implementation Team**<br>−POE managers<br>−CEITMP team<br>−SLA team<br><br>**State Implementation Team**<br>−SLA team<br>−ICC |
| Implementation Stages | *Exploration*<br>−Leadership team needs assessment in response to OSEP's call for RDA, fit of innovation within KEIS and feasibility for providers and consumers<br><br>*Installation*<br>−CEITMP & KCAR-R development, trained CEITMP team, embedded KEIS provider mandatory participation in service provider agreement<br><br>*Initial Implementation*<br>−Implemented CEITMP in 3 districts (small, medium, and large sized), obtained feedback for process improvement, field tested KCAR-R, and established reliability<br><br>*Full Implementation*<br>−Implemented CEITMP statewide, data shows providers can coach caregivers with fidelity, and child and family outcomes are achieved |

| Improvement Cycles | −CEITMP responded to problems and barriers and made quick, incremental improvements |
| | −Feedback obtained from districts and EI providers during initial implementation has been used to improve program |
| | −CEITMP & SLA teams collaborated to ensure program policies aligned with KEIS and ensured processes were transparent |
| | −Feedback obtained from each cohort across phases during initial implementation has been used to refine the CEITMP and KCAR-R |

*Note.* AIF = Active Implementation Frameworks; KEIS = Kentucky Early Intervention System; SLA = state lead agency; SSIP = State Systemic Improvement Plan; POE = point of entry; CEITMP = Coaching in Early Intervention Training and Mentorship Program; OSEP = Office of Special Education Programs; TA = technical assistance; KCAR-R = Kentucky Coaching Adherence Rubric-Revised; SPP/APR = State Performance Plan/Annual Performance Report; SC = service coordinator; DCES = district child evaluation specialist; PDS = professional development specialist; ICC = interagency coordinating council; RDA = results driven accountability.

### *Usable Innovations*

Blasé and colleagues (2018) described usable innovations as the focus of implementation efforts, such as practices, approaches, or programs, that are teachable, learnable, doable, and assessable in practice with fidelity measures that correspond to intended outcomes. Innovations may range from simple to complex, and detailed descriptions are needed for future replications. Innovations are usable and produce socially significant outcomes when they have clear descriptions, a coherent explanation of the essential functions that define the innovation, operational definitions of the essential functions, and a practical assessment of fidelity. The innovation examined in this study is the capacity-building approach of caregiver coaching, which providers use to support caregivers to help their children develop and learn.

### *Implementation Drivers*

Implementation drivers ensure the development of competency, organizational support, and engaging leadership components around an

innovation to support change reflecting an effective and sustainable framework (Metz et al., 2013). They are key to AIF and promote the adoption and use of an innovation leading to improved outcomes (National Implementation Research Network, 2022a). Fixsen et al. (2005) outlined the three implementation drivers as competency, organization, and leadership. To maximize the adoption and use of an innovation, the implementation drivers must be integrated and compensatory. Drivers share the same core beliefs and goals for the innovation, and the skills or abilities lacking in one driver can be counterbalanced by another driver.

The *competency drivers* of selection, training, coaching, and fidelity are connected and create processes that support change and ensure high fidelity of innovations that lead to positive outcomes, and for this dissertation study, included the selection and training of the implementation team, as well as CEITMP and KCAR-R development. *Organization drivers* aim to form, support, and sustain accommodating environments for effective services with facilitative administration, systems intervention, and decision-support data systems, and for this dissertation study, were comprised of the state lead agency (SLA), SSIP, and CEITMP teams. *Leadership drivers* support competency drivers and organization drivers by using technical or adaptive leadership strategies to correspond to different types of challenges during implementation efforts. Technical leadership typically involves a single individual who uses traditional approaches for solving common problems; and adaptive leadership strategies are employed by a group working together to address complex and unclear

problems with equally involved solutions that require time, collaboration, and test to resolve. The leadership drivers for this initiative constitute the SLA, SSIP, and Office of Special Education Programs (OSEP) teams.

### Implementation teams

Implementation teams have knowledge and skills around usable innovations. They may be comprised of existing staff, external experts, new staff, intermediary supports, and groups outside the organization at different levels, such as the district, region, and state. Implementation teams use effective evidence-based strategies to support systems' change in real world settings targeting application of an innovation with fidelity, sustainability, and scaling up (Metz et al., 2013). There are three levels of the KEIS SSIP implementation teams: (1) district teams comprised of point of entry (POE) managers and staff, KEIS providers, and a CEITMP PDS; (2) SSIP teams that include POE managers, the CEITMP and SLA teams; and (3) state teams that constitute the SLA team and the Interagency Coordinating Council (ICC).

### Implementation stages

Metz et. al. (2013) defined the implementation stages as the process of determining and operationalizing an innovation to improve outcomes. The four discernible stages are exploration, installation, initial implementation, and full implementation. Although there is a natural progression through the stages in pursuit of intended outcomes, there are often overlapping functions when transitioning to a next stage (National Implementation Research Network, 2022a). All four stages are critical to the process, and rather than functioning

independently, sustainability is integrated into each stage.

Metz et al. (2013) explained decisions to adopt innovations should be based on assessed needs, evidence, readiness for replication, and availability of resources during the *exploration stage*, which involves an iterative process of frequent communication between leadership, experts, stakeholders, and purveyors to determine if implementation of the innovation is feasible. The KEIS leaders completed a needs assessment in response to OSEP's Results Driven Accountability (RDA). In the *installation stage*, significant planning and use of resources occur as the initiative starts with a focus on building the capacity of implementers; developing a program around an innovation; designing fidelity measurements; and ensuring procedures, policies, hospitable systems, and environments are created. During installation, the implementation team developed the CEITMP and KCAR-R, trained the CEITMP team, and embedded mandatory KEIS provider participation into service provider agreements. The *initial implementation stage* requires managing change at all levels when the new initiative is launched. Continuous improvement and rapid-cycle problem-solving using data, decision-making, and ensuring consistent messaging and frequent communication for existing and new participants is critical during this time. The pilot implementation of the CEITMP in three different-sized districts utilized feedback for process improvement, and afforded CEITMP team the opportunity to field test and establish reliability on the KCAR-R.  Lastly, *full implementation* represents the complete integration of the innovation into all levels of the system. A successful change in the system is apparent when data indicate the innovation

is being provided skillfully and consistently. The CEITMP moved into full

implementation status and collected data on both intervention and

implementation fidelity, as well as obtained annual SPP/APR data on child and

family outcomes.

Sustainability embedded into each stage is crucial to success (Metz et. al.,

2013). Financial resources to sustain the infrastructure for the innovation should

be established, consistent, and sufficient for maintaining fidelity long-term.

Supports for continued success, such as effective training and coaching; fidelity

assessments; data to inform decisions, continuous improvements, and

adaptations; and policies and procedures that align with the innovation and

initiative should be in place and reviewed periodically (Metz et al., 2013).

**Improvement cycles**

Implementation teams use improvement cycles to continuously improve

processes, address problems, and identify solutions to challenges associated

with implementing intended innovations (National Implementation Research

Network, 2022a). *Plan, Do, Study, Act (PDSA)* cycles are processes to quickly

solve problems when innovations are initially being implemented. The CEITMP

coordinator responds to technical problems quickly and the team modifies

program procedures to reflect changes with immediate effect. *Usability testing* is

a planned set of checks to assess the feasibility and significance of an innovation

or processes for improvement. Survey feedback from each cohort of providers is

used to improve the CEITMP and clarify the KCAR-R. *Practice-policy feedback*

*loops* involve executive leadership becoming aware of barriers, ensuring policy

allows for sustained implementation, and transparent processes. Monthly SSIP

implementation meetings focus on collaboration to problem-solve and ensure

program processes are transparent align with KEIS policies. All three types of

improvement cycles, used for enhancing system functioning, can be used within

a subset of the larger system, the transformation zone. While scaling up

initiatives, the transformation zone focuses on developing a replicable, effective

framework for all components needed to implement a sustainable innovation with

fidelity.

**Effective Implementation, Intervention Practices and Sustainability**

EI/ECSE professionals (i.e., therapists, interventionists,

administrator/leaders, PDSs, consultants, and researchers) directly and indirectly

promote positive outcomes for young children at risk of or with developmental

differences and their families (Division for Early Childhood Recommended

Practices, 2014). To ensure the highest likelihood of positive outcomes, practices

should be based on or informed by current evidence and employed with fidelity

(Barton & Fettig, 2013; Cook & Odom, 2013; Dunst et al., 2013; Fixsen et al.,

2005). Dunst and colleagues (2013) defined EBPs as being scientifically

investigated with a focus on the key features of the practices that are empirically

linked to hypothesized outcomes and repeated under a variety of conditions.

Yet, knowledge of EBPs alone does not equate to effective implementation

(Odom, 2009); it requires consistent, repeated effort over time (Fixsen et al.,

2005). As shown in Figure 2, intended outcomes are achieved when effective

interventions are paired with effective implementations in enabling contexts

(National Implementation Research Network, 2022b).

**Figure 2**

*The Active Implementation Formula for Success*



*Note:* Active Implementation Formula: Reflective Questions. National Implementation Research Network Frank Porter Graham Child Development Institute. CC BY-NC.

The constructs of intervention and implementation are often used synonymously, but they are distinct in EI/ECSE. *Intervention* pertains to the practices, methods, or procedures used by intervention agents (e.g., therapists, interventionists) to advance improvements in outcomes, while *implementation* concerns the practices, methods, or procedures used by implementation agents (e.g., coach, trainer, consultant) to promote adoption and incorporation of the intervention into intervention agents' practices (Fixsen et al., 2005). Intervention fidelity relates to the degree to which intervention agents use practices as designed for optimal outcomes, and implementation fidelity describes the degree to which implementation agents use practices as designed to encourage the adoption and use of interventions/practices (Dunst et al., 2013).

Evaluating fidelity is multi-dimensional and the methods, rationale, and goals for assessing fidelity continue to evolve (Lemire et al., 2020; Snyder et al., 2013). Lemire and colleagues (2020) reviewed 23 studies on implementation and intervention fidelity and found that written documents (e.g., implementation logs, self-report checklists, questionnaires, program records) and observations (e.g.,

in-person, video, audio, interview) were the methods primarily used by researchers to collect fidelity data. Systematic literature reviews revealed that studies typically describe outcomes, frequently report intervention fidelity, though only sometimes report implementation fidelity (Barton & Fettig, 2013; Lemire et al., 2020; Neely et al., 2017; Ward et al., 2020).

In recent years, a focus on implementation fidelity has centered on understanding the effects of intervention practices and associated variables, including characteristics of participants and contexts, study goals, objectives, and the complexities of fidelity assessments (Ledford & Wolery, 2013; Lemire et al., 2020), and informing program and practice improvements (Snyder et al., 2015). Experts agree that assessing the fidelity of implementation practices, such as PD methods, is essential to understanding the extent intervention agents are employing intervention practices with fidelity to promote desired outcomes for children and families (Barton & Fettig, 2013; Dunst et al., 2013; Lemire et al., 2020; Neely et al., 2017; Snyder et al., 2013). Fidelity of intervention and implementation are integral to evaluating the effectiveness of innovations and intended outcomes and contribute to sustained practices (Dunst, 2015; Fixsen et al., 2005). Therefore, both should be comprehensively reported in practice-based investigations (Barton & Fettig, 2013; Dunst et al., 2013).

***Factors***

Fixsen and colleagues (2005) noted a gap in the literature on organizational and system influences on intervention fidelity, implementation fidelity, and sustained practices over time. Intervention and implementation

fidelity, as well as outcomes in EI/ECSE have been more widely studied (Barton & Fettig, 2013; Lemire et al., 2020; Neely et al., 2017; Ward et al., 2020) than sustained practices (Ai et al., 2022). Noted contributing factors and barriers to achieving intervention fidelity, implementation fidelity, and sustainability in EI/ECSE are explored and then summarized in Table 2.

Studies have identified attributes of EI intervention fidelity as including practices that align with providers' values, roles, existing practices, and ease to employ (Rieth et al., 2022); the fit of the practice model with the recipient's need (Vismara et al., 2013); and the training and support parents received from practitioners (Barton & Fettig, 2013). Lieberman-Betz (2015) proposed that dosage of the intervention, adherence to the practice model, quality of strategies used coupled with skills of the implementer, and responsiveness of recipients of the intervention, were linked to intervention fidelity. Alternatively, Vismara et al. (2013) described the lack of provider or agency buy-in and philosophical differences about the EI practice as barriers to intervention fidelity. Contextually dependent factors such as setting, environment, recipient's behavior (Lieberman-Betz, 2015), goodness of fit, and recipients acclimating to a new practice (Rieth et al., 2022) were also noted as challenges to intervention fidelity. Lastly, inconsistent and infrequent use of practices (Barton & Fettig, 2013), lack of standardized protocols for intervention, valid and reliable tools, and skilled implementers (Lieberman-Betz, 2015) were specified as obstacles to intervention fidelity.

Features associated with implementation fidelity have included

comprehensive PD, data-driven processes, and a good fit with the model (Ai et al., 2022; Barton & Fettig, 2013). Rieth and colleagues' (2022) study on Project ImPACT for Toddlers detailed pertinent factors of the program's implementation fidelity as individual learning styles; practices being relevant, practical, and built on existing skills and known strategies; the group training model; accessible, organized, user friendly training materials; opportunities for providers to practice and receive performance feedback and mentoring from a coach; and agency support. Proposed barriers to implementation fidelity have been attributed to lack of organizational backing and changes in supports such as leadership, policies, and funding (Ai, et al., 2022; Rieth et al., 2022). Concerns about managing competing demands of PD and workload (Rieth et al., 2022), perceived reduction in flexibility, and philosophical differences about the practice (Vismara et al., 2013) were also stated as challenges to implementation fidelity.

Leadership preparing systems for implementation, opportunities to collaborate with colleagues and stakeholders, capacity-building PD, access to resources, and data-based decision-making have been identified as contributing factors to sustained fidelity. Stakeholder engagement beginning at the development phase of PD was reported by EI providers as supportive to maintenance, which included ensuring practices were a match for the intended recipients (Rieth et al., 2022; Vismara et al., 2013). Capacity-building support has been linked to sustained practice including systematic, comprehensive PD; coaching, performance feedback, and training; and high-quality training materials in multiple, accessible formats (Ai et al., 2022). To sustain practices, Vismara et

al., (2013) highlighted having skilled coaches and mentors to support

practitioners to reach fidelity as key. Rieth and colleagues' (2022) revealed

having the tools to integrate the new practice into existing practices was

connected to sustainability. Resources, such as consistent funding streams for

activities, and continued access to high-quality materials and supports are

needed when planning for sustainability (Ai et al., 2022). Lastly, the collection

and use of data to evaluate and make decisions about practices and

implementation was important to sustainability as was access to electronic

systems for organizing and reviewing data (Ai et al., 2022).

Identified barriers to achieving sustainability included the lack of program

and system cohesiveness, common in early childhood programs which are often

managed by separate entities or operate under different policies, regulations, and

funding sources, with varying levels of access to high quality materials and

supports (Ai et al., 2022; Rieth et al., 2022). Vismara et al., (2013) also noted the

ability of systems and programs to monitor continued implementation fidelity in

real-world settings as supportive rather than punitive as a challenge. To illustrate,

participants indicated their lack of preparation and administrative support (e.g.,

additional training, resources, dedicated time needed to practice) contributed to

their unwillingness to voluntarily submit evidence of their continued fidelity to the

Early Start Denver Model (ESDM) for feedback and support.

Despite their importance in the context of an implementation science

framework, more studies examine intervention fidelity, implementation fidelity,

and outcomes than sustained practices (Barton & Fettig, 2013; Lemire et al.,

2020; Lieberman-Betz, 2015; Neely, et al., 2017). Implementing and refining a

new practice with fidelity is an iterative process that often takes years and

ensuring a plan for sustainability should be integrated from the inception (Fixsen

et al., 2005). Research-based contributing factors and barriers to achieving

intervention fidelity, implementation fidelity, and sustainability in EI/ECSE (Ai et

al., 2022; Barton & Fettig, 2013; Lieberman-Betz, 2015; Rieth et al., 2022;

Vismara et al., 2013) are summarized in Table 2.

**Table 2**

*Intervention and Implementation Fidelity and Sustainability Factors*

| Factors | Intervention Fidelity | Implementation Fidelity | Sustainability |
|---|---|---|---|
| | Contributing to | | |
| Practices being aligned with providers' values, roles, & existing practices | x | x | x |
| Practice matches with recipient's needs | x | x | x |
| Systematic, comprehensive, quality, capacity-building PD | | x | x |
| Opportunities to receive coaching and performance feedback from skilled mentor | | x | x |
| Leadership and organizational support, for processes, policies, and consistent funding | | x | x |
| Accessible, high-quality, user-friendly training materials in multiple formats | | x | x |
| Data-based decision-making processes | | x | x |
| Efficient and effective collaborative teaming and group training | | x | x |

| | | | |
|---|---|---|---|
| New practice matches learning styles, is practical, and linked to other known strategies | x | x | |
| Training and support valued by recipient | x | | |

| | | | |
|---|---|---|---|
| Barriers to | | | |
| Setting and/or recipients need to acclimate and accept new practice | x | | |
| Inconsistent and infrequent use of practices | x | | |
| Lack of standardized protocols for intervention with valid and reliable tools | x | | |
| Lack of skilled implementers | x | | |
| Philosophical differences about the practice | | x | |
| Concerns of managing competing demands of PD and workload and reduction in flexibility | | x | |
| Lack of cohesiveness. Programs operating under different policies, regulations, funding, etc. | | | x |
| Ability to monitor fidelity in real-world settings with support rather than punishment | | | x |

*Note.* Implementation fidelity, intervention fidelity, and sustainability factors were drawn from studies in Ai et al., 2022; Barton & Fettig, 2013; Lieberman-Betz, 2015; Rieth et al., 2022; Vismara et al., 2013.

### *Enabling Contexts*

To achieve desired outcomes, leadership must create space and provide the necessary foundation for transformation (Duda & Wilson, 2018). Building enabling contexts represented in AIF require policies, procedures, and practices that allow for changes and sustained improvements in programs, organizations, and systems. For example, models adopted by a state early intervention system

(EIS) included in vendor service provider agreements provide a context for change in practitioner practices. Enabling contexts that include practice-informed policies and aligned functions are crucial to the success of implementation to improve outcomes.

**Key Considerations for Effective Inservice PD**

AIF targeting systems' change align with CSPD efforts to support EI workforce development, focused on the acquisition and sustainability of evidence-based/informed knowledge and skills. Since many EI Providers were trained on and are using traditional therapy models (Bruder et al., 2021; Krick Oborn & Johnson, 2015; Marturana & Woods, 2012), actively participating in high-quality in-service opportunities can facilitate a change in their EI practice (Bruder et al., 2009; Campbell & Sawyer, 2009; Dunst et al., 2015; Marturana & Woods, 2012). Dunst et al. (2019) indicated PD practices:

> refer to the types of learning opportunities and experiences used with practitioners and how trainers, coaches, and other professional development specialists both engage practitioners in learning activities and encourage and support that learning…an implementation practice that was used by professional development specialists to promote practitioner's use of early childhood intervention practices. (p. 231)

Adult learning methods should be used by EI providers to support caregivers to help their children develop and learn, and they can also be used by PDSs to mentor and train EI providers in capacity-building practices. In their meta-synthesis, Dunst and colleagues (2015) identified adult learning methods

essential to high-quality in-service PD to promote positive outcomes for practitioners and those they serve, including PDSs introducing and illustrating practices; job-embedded opportunities for providers to practice and reflect on new knowledge and skills; mentoring and performance feedback from PDSs; adequate time and intensity to master the practice; and ongoing follow-up supports. EI providers reported teaming, collaboration, and group discussions during PD contributed to their practice change in mixed-methods studies (Rieth et al., 2022; Spence & Santos, 2019). Adult learning methods and opportunities for shared learning experiences embedded in well-designed PD for EI providers have the potential to support the development of a strong workforce.

  Although varying in dosage, content, components, facilitators, and formats of PD, researchers have investigated combinations of training and mentorship for EI providers to promote acquisition of knowledge (Childress et al., 2021), and targeted skills (Coogle et al., 2019; Meadan et al., 2020), as well as a change in practice (Campbell & Sawyer, 2009; Krick Oborn & Johnson, 2015; Marturana & Woods, 2012; Romano et al., 2021; Spence & Santos, 2019). A common thread of PD training includes introducing and illustrating specific content facilitated through synchronous or asynchronous formats. Recent studies noted narrated slide presentations, self-paced online modules, and handouts (Meadan et al., 2020) followed by knowledge checks (Childress et al., 2021; Coogle et al., 2019; Romano et al., 2021), group instructional activities with demonstrations (Campbell & Sawyer, 2009; Marturana & Woods, 2012; Spence & Santos, 2019), and one-on-one instruction (Krick Oborn & Johnson, 2015) as common formats

for introducing in-service content. Job-embedded opportunities for providers to

practice and self-reflect on the application of new knowledge and skills,

consistent with adult learning principles, was deemed important to include in PD

(Childress et al., 2021; Coogle et al., 2019; Marturana & Woods, 2012; Meadan

et al., 2020; Romano et al., 2021; Spence & Santos, 2019).  Performance

feedback, mentorship, and coaching as part of PD occurred synchronously via in

person or video conferencing, during facilitated individual or group reflection, and

time synced comments were offered on videos or video segments

asynchronously, including through email, and was provided by researchers

(Coogle et al., 2019; Krick Oborn & Johnson, 2015; Marturana & Woods, 2012;

Meadan et al., 2020), PDSs/researchers (Campbell & Sawyer, 2009; Childress et

al., 2021; Spence & Santos, 2019), or peers (Coogle et al., 2019; Romano et al.,

2021). Spence and Santos (2019) found that EI providers indicated participating

with a group of EI providers as one of the most supportive PD components for

facilitating their effective practice. Adequate time and intensity with ongoing

support to master the application of the content was regarded variably by

different researchers. PD dosages included six weeks (Childress et al., 2021),

nine weeks (Krick Oborn & Johnson, 2015), ten weeks (Spence & Santos, 2019),

twelve total hours (Campbell & Sawyer, 2009), fifteen total hours (Coogle et al.,

2019), four months (Romano et al., 2021); eight months (Marturana & Woods,

2012), and ten months (Meadan et al., 2020).

Studies on multi-component PD for EI providers have primarily reported

favorable results. A functional relation was detected between PD and use of

caregiver coaching practices (Meadan et al., 2020) and FGRBI practices (Romano et al., 2021). Researchers reported increases in skills such as application and knowledge of adult learning principles with PD (Childress et al., 2021), provider use of caregiver coaching strategies with coach performance feedback (Krick Oborn & Johnson, 2015), use of participation based-services with PD (Campbell & Sawyer, 2009); and specific caregiver coaching behaviors and expanded routines for services, as well as decreased child-focused intervention with PD (Marturana & Woods, 2012). EI providers in Spence & Santos' (2019) study reported variable changes in their practice after PD participation. Conversely, Coogle and colleagues (2019) did not detect a functional relation between PD delivered by peers and changes in EI providers' and caregivers' use of family engagement strategies and embedded learning opportunities. Moreover, Childress et al. (2021) noted an increase in EI providers' knowledge and application of adult learning principles, but no changes in their knowledge of early childhood caregiver coaching and recommended practices after a six-week PD. I reviewed these studies to obtain detailed descriptions of PD, fidelity assessed, outcomes, sustainability examined, and limitations reported.

Meadan et al., (2020) used a single case, multiple baseline research design with four triads (i.e., EI provider, caregiver, and coach) to examine the functional relation between Coaching Caregivers (CoCare) PD and EI providers' subsequent use of caregiver coaching with families targeting the development of their children's communication skills. CoCare PD is a cascading intervention

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model in which researchers virtually train and coach EI providers around caregiver coaching practices, who then support caregivers to use naturalistic communication strategies with their children who have communication needs. In the first intervention phase of the study, EI providers recorded EI visits for baseline; completed self-paced, online learning activities; recorded two additional EI visits; coached with a researcher until demonstrating fidelity to a checklist; and engaged in individual virtual meetings with researchers for reflection and feedback on caregiver coaching practices; followed by maintenance. In the second intervention phase, caregivers completed training modules and then received coaching from EI providers' around naturalistic communication strategies. At baseline phase, three EI providers showed little to no evidence of using caregiver coaching practices and one provider demonstrated some evidence of caregiver coaching practices utilization. After the self-paced online training phase, minimal or no improvement in caregiver coaching practices were observed via video recorded EI sessions. In the coaching phase, two EI providers demonstrated an immediate increase in their use of caregiver coaching practices, one took slightly longer, and one provider was unable to continue. All three remaining providers were able to reach and maintain fidelity according to the Global Coaching Fidelity Scale (GCFS) through the end of the coaching phase, indicating a functional relation between the CoCare PD and EI providers' increased use of caregiver coaching practices. The authors noted limitations of their study included the inadequacy of the GCFS to measure the quality of coaching practices, the absence of component analysis of the multi-faceted PD,

and the lack of child outcomes reported.

Romano et al. (2021) used a concurrent multiple probe single-case experimental baseline design to study the effects of a multi-component PD approach implemented by three trained, internal peer coaches, designed to promote change in nine EI providers' practices to align with the Family Guided Routines-Based Intervention (FGRBI) and caregiver coaching approaches. The peer coaches followed a protocol to support EI providers. During baseline phase, EI providers video recorded and submitted at least five typical sessions and did not receive feedback, training, or mentorship. During the three-week online module phase, peer coaches met with EI providers and used a narrated, standardized slide show for guiding content discussion. At the end of each meeting, EI providers selected goals to target with their families and peer coaches helped them to identify relevant strategies for support. In the coaching phase, EI providers used their video recorded EI sessions to self-reflect on their use of FGRBI key practices within TORSH™ and submitted to their peer coaches for feedback. The three peer coaches implemented the PD with fidelity, and a functional relation was detected between the PD and EI providers' use of FGRBI, with an increase in use of key indicators observed during coaching phase and replicated across three sites with large between case-standardized mean difference (BC-SMD) effect sizes ranging from 1.49 - 2.63. Additionally, paired sample $t$-tests on pre- and post-test scores indicated children made gains in their communication skills ($p < 0.01$). The limitations stated in this study included data limited to only the two families for which EI providers received peer coaching

support, the absence of generalization and maintenance data, the lack of reports on changes to caregiver use of strategies, and the breaks in data collection, which could impact the internal validity of single case, multiple probe designs.

Childress et al., (2021) used a mixed-methods, within-subjects, pre- and post-test design, to evaluate the effects of a six-week, multi-component PD course on EI providers' knowledge and use of adult learning principles. Five of nine EI providers, who volunteered for the PD, completed all activities and earned continuing education hours (CEUs) and gift cards. The researcher/trainer developed and delivered the virtual PD using adult learning principles and met with providers 90 minutes weekly. Three interactive, instructional webinar sessions were alternated with three support sessions in which providers reflected on content and experiences in a round robin format and received performance feedback. EI providers completed self-assessments following each meeting and worked on their individual goals related to supporting caregiver learning between meetings. Prior to and following PD, providers submitted video recorded EI visits and responded to a survey about their practices. All videos were edited to 32 minutes to match the minimum number of minutes submitted in a video, and 30-second interval coding was used to review videos. Paired $t$-tests from pre- and post-training showed statistically significant increases in EI providers' knowledge of adult learning principles with large effects ($d = 1.49$) and items answered correctly across providers about the principles, components, and strategies increased with a large effect ($d = 1.77$). There were no statistically significant increases in knowledge of early childhood caregiver coaching and recommended

EI practices found. The limitations noted in this study included small sample size, provider selection of the families recorded, distraction of a recording device during EI visits, lack of all content from video recorded EI sessions being coded, inability to pilot the knowledge measure and self-assessment prior to the study, and the researcher/trainer's bias.

Spence & Santos (2019) used mixed methods to investigate the facilitators and barriers to changing EI providers' practice and the effectiveness of PD components. The study targeted a training program that transitioned from single-day workshops with EI providers to an institute designed to form learning communities. Six service coordinator providers and 12 direct service providers volunteered and completed the training. Direct service providers paid for the training and all providers received 25 CEUs and gift cards for participation. The PD occurred in four, 5-hour sessions spanning ten weeks, and included five hours of additional activities. EI providers were placed in groups of 4-5 for the series of face-to-face trainings focused on the Mission and Key Principles of EI and family-centered practices. The PD consisted of teaming, reflection and individual feedback, small and large group discussion, video examples, practical scenarios, 15-20 minutes of video reflection and feedback on their own and peers' EI visits, and receiving performance feedback on their video after the last training session. Two experienced facilitators, including the first author, led the training and implemented 100% of the PD components with fidelity. According to the surveys, focus groups, and reflections, EI providers reported variable changes in their practice and noted the most effective PD components as the

reflective video activities, group discussions, and participating in a group of EI providers. They indicated barriers to changing their practices were existing expectations of families, current habits of EI service delivery, provider-determined flexibility in time and location of services, and leadership's lack of knowledge about EI. Limitations reported in this study included the sample of one institute of 18 providers in one geographical area of the state, lack of diversity in the focus group, and uncertainty around providers' previous training and exposure to the PD content.

Krick Oborn & Johnson (2015) used a multiple baseline design to examine three EI provider's use of specific caregiver coaching strategies with caregiver-child dyads during PD participation. EI providers in the Midwest were recruited by email; three who were implementing practices at similar lower levels were selected for the nine-week PD. For the workshop phase, two, one-on-one, 2-hour workshops targeting caregiver coaching strategies was delivered by the primary researcher during the first week. Providers then video recorded and submitted three weekly EI visits for review but no feedback. Then providers received weekly performance feedback via email on their recorded EI visits for the next six weeks. In maintenance phase, one recorded EI visit was reviewed four weeks following the last performance feedback to examine sustained practices. Visual analysis and percentage of non-overlapping data were used to measure changes in providers' use of caregiver coaching strategies using a 30-second partial interval coding method. Results indicated increased used of strategies with performance feedback. Only one EI provider demonstrated continued use of caregiver

coaching strategies in maintenance. Limitations were reported in this study.

Findings may have been impacted by the selection of three motivated EI

providers implementing practices at lower levels who had a relationship with the

primary researcher. The pre-determined six-week duration and intensity of

performance feedback may not have been adequate to support practice change.

The exclusion of provider self-reflection and self-assessment may have impacted

learning and maintenance of caregiver coaching skills. Providers and families

may have behaved differently when recorded, and providers likely only used

caregiver coaching strategies when they recorded. Lastly, generalization of

caregiver coaching with other families was not a focus.

      Campbell & Sawyer (2009) investigated a PD designed to explore EI

providers' adoption and use of participation-based practices using Natural

Environments Rating Scale (NERS) percentages, EI Q-sort survey results, and

follow up interviews. A total of 96 cross-disciplinary providers completed all

requirements of a12-hour of PD which included two, 3-hour group trainings, with

a three-month period of self-study between. EI providers selected the date, time,

and location of the PD most convenient for them. During the first training, two

instructors used standardized content around participation-based practices

highlighting caregiver and provider roles using slides, pictures, and video

examples with groups of 10-15 providers. For the self-study, EI providers

recorded a session with the family of their choice and completed a self-reflection

on 20 minutes of the video using the NERS and set reflective questions. They

then recorded a second EI visit and interviewed the family about their routines. In

the last training session providers showed a segment of their recorded EI visit and instructors facilitated group discussion, provided feedback, and posed questions to the group. The NERS scores showed participation-based services increased from 34.4% on initial video recordings to 57.3% on second video recordings, and no statistically significant differences by provider discipline or experience were found. Limitations were noted in the study. Representativeness may have been impacted by the convenience sample of EI providers from a large, northeastern city and those who did not complete the PD. No baseline performance was obtained; providers self-selected only one child and family for their video recordings; no generalization or maintenance was explored; providers received little feedback on their videos; and the PD duration, intensity, and individualized support may not have been enough to influence practice change.

Marturana & Woods (2012) examined the effects of a Distance Mentoring Model (DMM) of PD to expand cross-disciplinary EI providers' knowledge and skills in FGRBI. Providers were recruited, placed in groups of two, attended the initial training, participated in DMM through Skype and conference calls, and were paid for one hour of weekly participation in mentoring activities. A total of 18 of 34 providers submitted at least four of eight monthly video recorded EI sessions, attended both the trainings in the 8-month period, and participated in at least four feedback sessions. The expert mentor selected 1-minute clips related to the providers' goal with the family and 1-minute clips of a missed opportunity from the video recordings and used them during the1-hour feedback sessions with the peer group. The expert mentor followed a feedback fidelity checklist to

deliver feedback and included opportunities to problem-solve, action plan, self-reflect, and follow up via email with a summary. During feedback sessions via Skype, video clips were reviewed with slides highlighting key components for discussion. In conference calls, providers were asked to recall excerpts from their submitted videos and the expert mentor shared verbatim examples. Research assistants used 30-second interval coding to identify FGRBI caregiver coaching strategies and routines in video recorded full EI sessions. Results of paired sample $t$-tests showed a decrease in child focused intervention with a large effect size from the first to second video ($d = 0.92$), and first to fourth video ($d = 1.03$), and an increase in specific caregiver coaching behaviors with a large effect size from the first to second video ($d = 1.28$), and first to fourth video ($d = 0.97$). No differences in conversation and information sharing, joint interactions, or other interactions were noted. Lastly, there was a significant decrease in the number of routines centered on play ($t = 2.06$) between the first and second video, and a significant increase in family and community routines ($t = 2.03$) between the first and fourth video. Limitations were stated for this study. Most providers only recorded with one family on their caseload; therefore, generalization of practice change was not known. The uncertainty of the impact of the length of time and established relationships providers had with families, the absence of examining child and family outcomes, the high rate of participant exclusion (47%) due to incomplete data, and the inability to analyze individual components due to the design of the PD package were also limitations.

Coogle and colleagues (2019) used a multiple-probe single case design

with three caregiver, child, and EI provider triads to ascertain whether there was a functional relation between technology enhanced performance feedback (TEPF) PD delivered by their peers and EI provider and caregiver use of family engagement strategies and embedded learning opportunities (ELOs). The PD intervention included a traditional PD condition consisting of a 30-minute narrated slide presentation followed by immediate response to five questions via email, capturing two videos at the next EI session and one additional video at the subsequent EI session. For the TEPF condition, EI providers uploaded a 10-minute video from each session and within 72 hours, coaches provided written affirmative and suggestive feedback and reflective questions around family engagement and ELOs using examples from the videos. EI providers responded to the reflective questions via email. Two to three weeks following the completion of TEPF, EI providers submitted 1-3 videos to determine maintenance of skills. Results indicated that within TEPF, all three EI providers and caregivers had overlapping data with previous conditions and indicated no functional relation between TEPF and use of the strategies. Data for each EI provider's use of family engagement strategies overlapped with previous conditions with a decelerating trend within TEPF and showed no functional relation. Lastly, although increasing levels of ELOs were present at TEPF, two out of three triads had overlapping data with previous conditions and a decelerating tend, with no functional relation. These findings were inconsistent with previous research. Limitations noted in this study included the 10-minute time samples from EI sessions, and the pre-existing relationships of the peer coaches who selected EI

providers for the study.

Effective PD results in positive outcomes for EI practitioners (Campbell & Sawyer, 2009; Childress et al., 2021; Krick Oborn & Johnson, 2015; Marturana & Woods, 2012; Meadan et al., 2020; Romano et al., 2021; Spence & Santos, 2019), ultimately impacting the young children and families they serve (Dunst et al, 2013; Fixsen et al., 2005). To ensure PD is high-quality and results driven, evidence-informed frameworks should be used for design, outcomes must be specified, implementation guidelines should be established and adhered to, and fidelity must be assessed. Taken together, these result in advancing a distinguished EI workforce focused on positive outcomes for children and families.

Limitations in studies that examined multi-component PD and changes in EI providers' knowledge and practices included sample size, lack of full EI video recorded session review, limited PD duration and intensity, and EI providers self-selecting families to participate. Single case research designs in education typically involve small sample sizes (Ary et al., 2010), which was the methodology used for several of the investigations reviewed (Coogle et al., 20019; Krick-Oborn & Johnson, 2015; Meadan et al., 2020; Romano, et al., 2021) with the number of participants ranging from 1-4. Some of the mixed-methods studies had small sample sizes including nine (Childress et al., 2021), and one institute of 18 providers (Marturana & Woods, 2012; Spence and Santos, 2019). Interval coding (Coogle et al., 2019; Krick Oborn & Johnson, 2015; Marturana & Woods, 2012) and reviewing only segments of video recorded

EI visits (Campbell & Sawyer, 2009; Childress et al., 2021; Coogle et al., 2019) may have contributed to missed evidence of skills. Knowing that they were being recorded may also impact performance (Childress et al., 2021; Krick Oborn & Johnson, 2015). Lastly, studies noted lack of sufficient PD frequency, duration, and intensity (Campbell & Sawyer, 2009; Krick Oborn & Johnson, 2015) may have impacted results.

Gaps in this reviewed literature on PD for EI providers included inconsistent reports of intervention and implementation fidelity in EI linked to child and family outcomes, limited exploration of EI provider generalized and sustained skills, and minimal descriptions of results by EI provider characteristics (e.g., discipline, years' experience). Child and family outcomes linked to intervention and implementation have begun to emerge in the EI literature (Romano et al., 2021, Coogle et al., 2019), but more is needed. Since intervention and implementation fidelity linked to outcomes is connected to sustained practice change (Ai et al., 2022; Coogle et al., 2019; Fixsen et al., 2005; Krick Oborn & Johnson, 2015; Meadan et al., 2020; Rieth et al., 2022; Vismara et al., 2013) more research studies are needed to examine EI provider generalized and sustained fidelity of recommended skills and practices, such as caregiver coaching, following participation in PD. Campbell and Sawyer's (2009) study was the only investigation I located that examined results by EI provider discipline and years' experience. Additionally, the EI providers in this study were required to participate in a real-world PD. Conversely, other authors explained their participants were recruited or volunteered (Childress et al., 2021; Coogle et al.,

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2019; Krick Oborn & Johnson, 2015; Marturana & Woods, 2012; Meadan et al., 2020; Romano et al., 2021; Spence & Santos, 2019) to engage in PD activities to enhance their practices, and many received incentives. For example, participants received CEUs (Coogle et al., 2019; Meadan et al., 2020; Spence & Santos, 2019), gift cards (Childress et al., 2021; Spence & Santos, 2019), and paid time for engaging in mentoring (Marturana & Woods, 2012). Thus, further inquiry of attributes is warranted to explore differences in provider characteristics, such as discipline and years' experience, as well as research volunteers versus real-world contexts.

This study, informed by limitations of previous studies and gaps in the literature, contributes to the state of science on intervention fidelity of a practice and PD implementation fidelity. I used the active implementation formula framework to examine PDS fidelity to implementing the CEITMP for providers' who were mandated to participate and demonstrate sustained fidelity to caregiver coaching practices. I also reported on KEIS annual SPP/APR child and family outcomes. Lastly, I explored differences in providers' scores according to discipline, years' experience, cohort, and launch group.

**Caregiver Coaching Effectiveness**

Part C of the IDEA (2004), the Mission and Key Principles of EI (Workgroup on Principles and Practices in Natural Environments, OSEP TA Community of Practice: Part C Settings, 2008), and the DEC RPs (2014) advocate for family-centered, capacity-building approaches for supporting caregivers of infants and toddlers with developmental differences to help their

child develop and learn, such as caregiver coaching. DEC RPs' (2014) family strand represents family-centeredness, family capacity-building, and family-professional collaboration, the essence of caregiver coaching. Yet, many EI providers find caregiver coaching challenging and continue to deliver child-focused interventions (Bruder et al., 2021; Friedman et al., 2012; Romano & Schnurr, 2022). Determining the effectiveness, or desired result, of caregiver coaching in EI is complex, due to the individualized nature and varying system approaches to managing Part C services. Definitions, components, measurements, and outcomes of caregiver coaching were explored to provide a foundation for the effectiveness of the practice central to a high-quality PD program aimed at increasing EI providers' capacity to support caregivers in KEIS.

Kemp and Turnbull (2014) and Friedman et al., (2012) addressed the lack of an accepted, universal definition of caregiver coaching and components in EI. Aranbarri and colleagues (2021) highlighted that coaching is often mistakenly used equivalently with the terms training and education, which refer to the provider working with the child and discussing the interventions with caregivers, respectively. Caregiver coaching is a relationship-directed process that encompasses the ideals of family-centered practice (Kemp & Turnbull, 2014) and includes an emphasis on triadic interactions between the caregiver, provider, and child designed to facilitate active caregiver participation (Aranbarri et al., 2021; Ciupe & Salisbury, 2020; Friedman et al., 2012; Pellecchia et al., 2022; Rush & Shelden, 2020) resulting in their enhanced competence and confidence in supporting their child (Ciupe & Salisbury, 2020). Kemp and Turnbull (2014)

acknowledged Rush and Shelden's (2011) definition of coaching is frequently

used in EI:

> an adult learning strategy in which the coach promotes the learner's ability
>
> to reflect on his or her actions as a means to determine the effectiveness
>
> of an action or practice and develop a plan for refinement and use of the
>
> action in immediate and future situations. (p. 8)

Rooted in trusting relationships and adult learning theory (Friedman et al.,

2012; Marturana & Woods, 2012), caregiver coaching in EI is an interaction style

or approach, comprised of several components aimed to build caregiver capacity.

Salisbury & Copeland (2013) identified caregiver coaching strategies as targeted

information sharing (S), observation and opportunities for caregiver practice with

provider feedback (OO), problem solving and reflection (P), and review of the

session (R; SOOPR) and used a checklist format to measure the presence of the

characteristics as observed, partially observed, or not observed during EI visits.

Pellecchia and colleagues (2022) identified comparable core elements of

caregiver coaching including use of authentic learning experiences, collaborative

decision-making, demonstration, in vivo feedback, and reflection. Rush and

Shelden (2020) described the practical use of the five caregiver coaching

characteristics of joint planning, observation, action/practice, reflection, and

feedback. Clearly, there is much congruence between these scholars' identified

characteristics, strategies, and core elements of coaching used to support

caregivers to help their children develop and learn.

Nonetheless, there are challenges with systematically replicating the key

components and behaviors of caregiver coaching (Kemp & Turnbull, 2014; Ward et al., 2020). The complex, individualized nature of caregiver coaching focused on families' priorities and routines is often inconducive to a consistent, reproducible procedure. However, framing an EI visit by using the common caregiver coaching characteristics with fidelity can provide some consistency in processes to evaluate the quality and effectiveness of EI provider behavior.

*Caregiver Coaching Outcomes*

Measuring and determining the efficacy of caregiver coaching in EI has been researched on a scant scale. Child developmental progress has been explored using the Early Learning Accomplishment Profile-Revised (ELAP-R) and proportional change index (PCI; Salisbury & Copeland, 2013), and the Individual Growth and Development Indicators for Infants and Toddlers (IGDI)- Early Communication Indicator (ECI; Ciupe & Salisbury, 2020; Romano et al., 2021) and Early Movement Indicators (EMI; Ciupe & Salisbury, 2020). Although variable, children made 12–13-month developmental gains according to the ELAP-R with the most significant gains in fine motor, cognitive and self-help, whereas the PCI showed changes in gross motor, social-emotional, and self-help areas (Salisbury & Copeland, 2013). Additionally, gains were detected in children's physical development on the IGDI-EMI (Ciupe & Salisbury, 2020), and social and communication areas on the IGDI-ECI (Ciupe & Salisbury, 2020; Romano et al., 2021).

While positive child outcomes are the central focus in EI, building the capacity of caregivers equips them to support their child's development and

learning (Division for Early Childhood, 2014; Individuals with Disabilities

Education Act, 2004) both in the present and the long-term. Caregiver coaching

is a capacity-building mechanism for EI providers to promote caregiver self-

efficacy, competence, and confidence. A small number of studies in the Part C

context have investigated caregiver outcomes related enhanced capacity. To

ensure alignment with IDEA, the Mission and Key Principles of EI, and the DEC

RPs, the requisite caregiver outcomes explored in this review represented family

identified priorities, rather than a pre-determined practice, skill, program, or

developmental domain. To measure effectiveness related to caregiver outcomes,

various measures have been used including the Early Intervention Parenting

Self-Efficacy Scale (EIPSES) and feedback surveys (Salisbury & Copeland,

2013); the caregiver feedback survey (CFS), an adaptation of the Intervention

Rating Profile–15 (Salisbury et al., 2018); and the Parenting Interactions with

Children: Checklist of Observations Linked to Outcomes (PICCOLO; Roggman et

al., 2013) in Ciupe and Salisbury (2020).

     Three studies were identified with research questions focused on

caregiver outcomes (Ciupe & Salisbury, 2020; Salisbury & Copeland, 2013;

Salisbury et al., 2018), while two articles reported provider perspectives of

caregiver benefits and outcomes (Douglas et al., 2020; Jayaraman et al., 2015).

Themes merged around caregiver outcomes as a result of caregiver coaching in

Part C, including caregiver enhanced capacity to help their child develop and

learn, greater participation of caregivers in EI sessions, and notable increased

caregiver investment in working toward outcomes.

***Enhanced Caregiver Capacity***

Salisbury & Copeland (2013) completed an exploratory case study with 21 infants/toddlers in which a caregiver coaching approach was utilized by Part C providers. The FGRBI approach combined with reflective practice, mentoring, and problem-based learning components to form the Chicago Early Intervention Project (CEIP) service delivery model was used to support providers, who participated in weekly reflective supervision and twice monthly communities of practice. Caregiver ratings on the EIPSES coupled with study survey responses indicated caregivers developed a stronger sense of self-efficacy; direction; and more confidence in advocacy, teaching, and engaging with their child. Similarly, Salisbury and colleagues (2018) investigated 19 caregivers' and 11 Part C EI providers' shared experience in home visits during the development, refinement, and evaluation of Embedded Practices and Interventions with Caregivers (EPIC), a 10-hour PD, that targeted a caregiver coaching approach. Group and individual semi-structured interviews, caregiver feedback surveys, and focus groups revealed caregivers viewed the coaching process as positive and effective in increasing their understanding. They acknowledged they were included in sessions and worked jointly with providers to help their child which differed from previous traditional EI services received. They indicated partnering in existing routines and activities was supportive, and they did not feel judged during coaching sessions. These results of increased caregiver capacity, empowerment, confidence, and competence have been corroborated in studies reporting providers' perspectives on use of caregiver coaching (Douglas et al., 2020;

Jayaraman et al., 2015).

### *Active Participation in EI Sessions*

Stronger caregiver feelings of self-efficacy, competence, and confidence serve as a catalyst for active caregiver participation in EI sessions. Ciupe & Salisbury (2020) used secondary analysis of recoded video tapes from the EPIC project to complete a two-year single case study. Coded observations and the PICCOLO (Roggman et al., 2013) were used to examine how a caregiver coaching process implemented by one provider impacted three caregivers' ability to take the lead in supporting their child's learning in daily routines. A functional relation was found between the SOOPR caregiver coaching model and caregiver initiations of teaching, responsiveness, and encouragement with their children, suggesting a systematic coaching approach resulted in caregivers' independent use of targeted strategies designed to support their children's learning and enhance their caregiver-child relationship during intervention and in maintenance. As caregivers increased their initiations of interactions with their children, the provider decreased the frequency of coaching strategies used and served in a more supportive role, which demonstrated increased caregivers' capacity to support their children's learning and development. Providers have also expressed that caregiver coaching elicits greater caregiver participation (Douglas et al., 2020; Jayaraman et al., 2015).

### *Caregiver Investment*

Lastly, caregiver investment in supporting their child's learning and commitment to achieving developmental and family goals was an identified

outcome of caregiver coaching. Caregivers feeling confident to initiate during EI

visits led to increased use of strategies and carryover between EI visits (Ciupe &

Salisbury, 2020). Jayaraman and colleagues (2015) indicated providers reported

that caregiver coaching elicited greater caregiver investment in outcomes.

Fostering trusting relationships with caregivers is foundational to

successful, productive EI visits. Consistent with Rush and Shelden's (2020)

depiction of effective coach characteristics, caregivers in Noll and colleagues'

(2022) qualitative study described coaching practitioners as meeting them where

they are using words such as "supportive, listens, reassuring, caring,

collaborative, prepared, flexible, non-judgmental, patient, passionate, consistent,

and understanding" (p. 27). These attributes contribute to a trusting relationship,

the foundation to establish caregiver-provider partnerships for successful Part C

EI visits. To increase caregiver buy-in and active participation, providers build

relationships, clarify roles, and discuss the coaching approach (Douglas et al.,

2020; Jayaraman et al., 2015). Although providers indicated it was a challenge to

integrate into their practice, caregivers reported valuing observation and

reflection practices (Salisbury & Copeland, 2013). EI providers' approach to joint

planning correlated to more active caregiver participation and proposing new

ideas, and reflection was suggested to correlate with caregiver confidence in

Jayaraman et al. (2015).

**Summary**

There are a dearth of studies exploring aspects of effective

implementation, intervention, and enabling contexts to support EI practitioners'

adoption and sustained use of effective caregiver capacity-building practices and their associated child and family outcomes. Contributing factors to intervention fidelity, implementation fidelity, and sustainability of EI practices have been identified in the literature (Ai et al., 2022; Barton & Fettig, 2013; Lieberman-Betz, 2015; Rieth et al., 2022; Vismara et al., 2013), and researchers (Barton & Fettig, 2013; Dunst et al., 2013; Fixsen et al., 2005; Odom, 2009) have called for future studies to include intervention and implementation fidelity when reporting study outcomes, since their absence can affect results. Studies with intervention fidelity, implementation fidelity and outcomes data collected on real-world, evidence-informed PD integrating the research-based adult learning principles (Dunst et al., 2015; Spence & Santos, 2019) that target EI providers' approaches to increase caregiver capacity to support their child's learning and development can demonstrate the translation of research to practice.

After determining the need for improvements centered on positive child and family outcomes, KEIS applied AIF to produce a significant change in its system. They adopted the innovation of caregiver coaching practices, and the leadership established implementation teams to focus on competency drivers. The primary activity, the CEITMP, a real-world, mandatory, evidence-informed, multi-component PD program was developed to support cross-disciplinary providers to implement caregiver coaching with fidelity. The present study investigates a substantial number of KEIS providers' sustained *intervention fidelity* to caregiver coaching practices according to the KCAR-R measure, after participating in the CEITMP, while also examining PDSs' *implementation fidelity*.

Additionally, KEIS SPP/APR data provides context for the study.

CHAPTER 3 METHODOLOGY

This chapter details the methodology used to examine KEIS providers'
sustained intervention fidelity to caregiver coaching practices and PDSs' fidelity
to implementing a mandatory, multi-component, evidence-informed PD program.

**Research Questions and Variables**

1. What changes are there in caregiver coaching skills as measured by the
   KCAR-across baseline, immediately following high-intensity training and
   mentorship, and first maintenance period assessment markers for KEIS
   providers who completed the CEITMP? The dependent variable of
   caregiver coaching skills as measured by the KCAR-R was assessed
   using a ratio level of measurement, while the independent variable of time
   point, baseline, following high-intensity training and mentorship, and first
   maintenance period was examined using a nominal level of measurement.

2. What differences are there in KEIS providers' fidelity to a defined set of
   caregiver coaching skills measured by the KCAR-R based on
   characteristics of discipline, years' experience, cohort, and launch group
   at baseline, immediately following high-intensity training and mentorship,
   and first maintenance period assessment markers? The dependent
   variable of caregiver coaching skills as measured by the KCAR-R was
   assessed using a ratio level of measurement, while the independent

variables of key assessment marker: baseline, following high-intensity training and mentorship, and first maintenance period by characteristics: discipline, years' experience, cohort, and launch group was examined using a nominal level of measurement.

3. What differences are there in KEIS providers' sustained caregiver coaching skills as measured by the KCAR-R on their initial maintenance period submission based on engagement in recommended, optional preparatory activities of attending a maintenance refresher group meeting, viewing videos in the exemplar library, both, or no engagement? The dependent variable of caregiver coaching skills at initial maintenance period as measured by the KCAR-R was assessed using a ratio level of measurement, while the independent variable of attending the maintenance refresher group meeting, viewing exemplar videos, both attending the maintenance refresher group meeting and viewing exemplar videos, and no engagement in recommended, optional preparatory activities prior to initial maintenance video submission was examined using a nominal level of measurement.

4. What differences are there in KEIS providers' sustained caregiver coaching skills measured by the KCAR-R on their initial maintenance period submission based on the length of time that occurred following their completion of the CEITMP (i.e., 2-4 months, 5-8 months, 9 months, 12, months, 18 months)? The dependent variable of sustained caregiver coaching skills as measured by the KCAR-R on initial maintenance

submission was assessed using a ratio level of measurement, while the independent variable of length of time between CEITMP completion and initial maintenance period was examined using a nominal level of measurement.

5. What degree of fidelity did PDSs implement the CEITMP with providers in cohorts 11-16? Descriptive statistics were used to report results.

6. What levels of assistance/flexibility did PDSs use to support EI provider successful completion of the CEITMP? Descriptive statistics were used to report results.

**Study Context**

In response to the call for RDA, KEIS stakeholders used principles of implementation science to develop a comprehensive SSIP (Kentucky Cabinet for Health and Family Services, 2021) focused on creating a high-quality EI workforce and improving outcomes for young children with developmental differences and their families. Table 1 linked AIF to Kentucky's SSIP efforts. Given that active engagement with learning and ongoing support are more effective than one-day workshops or module trainings (Bruder et al., 2021; Snyder et al., 2011), the CEITMP was developed. The CEITMP, comprised of both training and mentorship components, embedded recommended adult learning methods (see Appendix A), including PDSs introducing and illustrating practices; job-embedded opportunities for providers to practice and reflect on knowledge and skills; mentoring and performance feedback from PDSs; adequate time and intensity to master the practice; ongoing follow-up supports

(Dunst et al., 2015); and teaming, collaboration, and group discussions while learning the practice (Spence & Santos, 2019).

The CEITMP, summarized in Appendix B, focused on supporting KEIS providers to employ a caregiver coaching approach with fidelity. The quick view, shown in Figure 3, details the four-phase PD that spanned 32 weeks with an estimated time expenditure of up to 90 minutes weekly depending on provider base knowledge of caregiver coaching at enrollment, level of engagement throughout the program, and proficiency with technology/platforms. The desired outcomes for the CEITMP for EI providers included: (1) considering existing knowledge and practices in the context of recommended practices, (2) increasing knowledge of strength-based caregiver coaching, (3) demonstrating caregiver coaching practices with fidelity during early intervention visits, and (4) developing a network of support among early intervention colleagues. Cohorts of up to 28 cross-disciplinary providers were enrolled in the CEITMP every three to four months. After determining meeting availability and group preferences, small groups of up to six providers were formed and assigned to one PDS, who served as their coach and mentor.

The CEITMP team met twice weekly to discuss program implementation activities, provider completion status, needs, and process improvement opportunities. CEITMP team members rotated facilitating and note-taking responsibilities for these meetings. At the end of each CEITMP phase, PDSs completed a team-developed checklist for all providers in their groups to

document activities successfully submitted within designated time frames and

noted afforded flexibility or individualized joint plans when indicated.

**Figure 3**

*CEITMP Quick View of Weekly Activities*

| DATES | PHASE WEEK | QUICK VIEW of Content | ACTIVITIES |
|---|---|---|---|
| Aug-Nov | CEITMP Enrollment | Pre CEITMP data on current coaching practices | Baseline Video w/consent & Kick-off Prompt Question |
| Nov 29-Dec 5 | *KICK OFF* | **CEITMP INTRODUCTION/Kick Off** | *Virtual CEITMP Kick OFF* + Survey |
| Dec 6-12 | Discovery Phase DPW1 | Coaching | eLearning module |
| Dec 13-19 | DPW2 | *Effective Coaches & Coaching Compared to Other Approaches* | Handbook |
| Dec 20-Jan 2 | WINTER BREAK | WINTER BREAK | WINTER BREAK |
| Jan 3-9 | DPW3 + GM1 | **Coaching Script/Coaching vs Consulting** | Group Meeting 1 |
| Jan 10-16 | DPW4 | Strengths | eLearning module |
| Jan 17-23 | DPW5 | *How to Use a Coaching Style of Interaction* | Handbook & view coaching clips |
| Jan 24-30 | DPW6 + GM2 | **Strengths/Adult Learning/Reflective Questions** | Group Meeting 2 |
| Jan 31-Feb 6 | DPW7 | *Strategies for Learning the Coaching Process* | Handbook |
| Feb 7-13 | DPW8 | Home & Community Visits | eLearning module |
| Feb 14-20 | DPW9 | *Coaching Families* | Handbook & view peer coaching clips |
| Feb 21 - 27 | DPW10 | 5 Characteristics of Coaching | 5 Coaching Characteristics DP End Reflective Activity |
| Feb 28-Mar 6 | DPW11 + GM3 | **Peer Coaching & Coaching Characteristics Review** | Group Meeting 3 |
| Mar 7-13 | DPW12 | *Coaching Teachers* & survey | Handbook + Survey |
| Mar 14-20 | Mentorship Phase MPW1 | TECHNOLOGY TRAINING | Technology Training Completion |
| Mar 21-27 | MPW2 + GM4 | **Introduction to the Rubric** | Group Meeting 4 |
| Mar 28-Apr 3 | MPW3 | CQ Intro, Exemplar, Video, Self-Reflect & Share | Complete self-assessment on CQ7/CQ1 clip |
| April 4-10 | MPW4 | CQ Intro, Exemplar, Video, Self-Reflect & Share | Complete self-assessment on CQ2/CQ1 clip |
| April 11-17 | MPW5 | CQ Intro, Exemplar, Video, Self-Reflect & Share | Complete self-assessment on CQ3/CQ1 clip |
| April 18-24 | MPW6 + GM5 | **Review CQ1, CQ7, CQ2 & CQ3** | Group Meeting 5 |
| Apr 25-May1 | MPW7 | CQ Intro, Exemplar, Video, Self-Reflect & Share | New Video: Complete self-assessment on CQ4/CQ1 clip |
| May 2-8 | MPW8 | CQ Intro, Exemplar, Video, Self-Reflect & Share | Complete self-assessment on CQ5/CQ1 clip |
| May 9-15 | MPW9 | CQ Intro, Exemplar, Video, Self-Reflect & Share | Complete self-assessment on CQ6/CQ1 clip |
| May 16-22 | MPW10 + GM6 | **Review CQ4, CQ5, CQ6 & CQ1** | Group Meeting 6 + Survey |
| May 23-29 | Fidelity Phase FPW1 | Submit and Self-Assess Video-1 (V1) | Video-1 - New Full Video |
| May 30-Jun 5 | FPW2 | Reflect/respond on feedback/questions for Video-1 | Reflection |
| June 6-12 | FPW3 + GM7 | **Fidelity to Coaching Reflection** | Group Meeting 7 |
| June 13-19 | FPW4 | Submit and Self-Assess Video-2 (V2) | Video-2 - New Full Video |
| June 20-26 | FPW5 | Reflect/respond on feedback/questions for Video-2 | Individual meetings with coaches as needed |
| Jun 27-July 3 | FPW6 | Submit Video3 & Self-Assess *Exempt if fidelity on V1 & V2 | Video-3 - New Full Video (unless exempt) |
| July 4-10 | Prof Dev Phase PDPW1 | Reflect on growth in using coaching approach | Review & reflect on baseline video |
| July 11-17 | PDPW2 + GM8 | **Prepare for Maintaining Coaching & Web of Support** | Group Meeting 8 after demonstrating fidelity |
| July 18-24 | PDPW3 | Professional Development Plan | Exit Survey + CEITMP Plan |

*Note.* CEITMP = Coaching in Early Intervention Training and Mentorship Program.

### *CEITMP Enrollment*

To afford providers adequate time to prepare and plan for participation in

the CEITMP, correspondence with each cohort was facilitated through a program

email three months prior to the PD kickoff. Initial email communication included

general information, timelines, a survey, access to program platforms, and next

steps including instructions for submitting a baseline video recording of an entire

EI visit via TORSH Talent™. Providers had access to public caregiver coaching

information during this time, but it is not known how many providers accessed this information. Providers were assigned University of Louisville organization Blackboard accounts approximately two weeks prior to the start of the CEITMP to access program materials. PDSs reviewed baseline videos and rated them according to the KCAR-R to assess fidelity to a defined set of caregiver coaching strategies. Feedback was not provided to participants. However, providers who demonstrated fidelity or very near fidelity at baseline were offered the opportunity to individualize their PD experience.

### CEITMP Kickoff

In the first of the 32 weeks, the CEITMP team facilitated a required, 90-minute virtual kickoff meeting to provide an overview of the program, review requirements, introduce strength-based, caregiver coaching, and answer questions from a cohort of providers when they began the program. At the end of the kickoff meeting, groups transitioned to break out rooms to meet with their PDS. The kickoff was designed to help providers smoothly transition into the PD; therefore, a required alternative activity was sent to EI providers who missed the meeting, which included watching the recorded kick off meeting and responding to prompts about the content of the meeting.

### CEITMP Discovery Phase

The first phase of the CEITMP targeted 12 weeks of developing foundational knowledge around strength-based, caregiver coaching via synchronous and asynchronous activities. Recommended asynchronous self-study activities included readings from *The Early Childhood Coaching Handbook*

(Rush & Shelden, 2020), eLearning lessons in a voice over slide deck format (Dunn & Pope, 2017), and targeted resources (e.g., articles, exemplar videos, handouts, program-developed materials). PDSs facilitated three monthly, 90-minute, synchronous small group discussions and addressed designated content, demonstrated components of caregiver coaching, and invited providers to practice and plan for integrating caregiver coaching elements in their sessions. Based on the needs of providers and preferences of PDSs, slide decks and video examples were used to enhance small group discussions. In week 10, providers completed the culminating activity of this phase to review a video recording of a peer's EI session, reflect, and identify components of caregiver coaching within the TORSH Talent™ platform, which afforded PDSs the opportunity to assess EI providers' knowledge of caregiver coaching. The PDSs responded to the completed activity by answering providers' questions and making any necessary clarifications. During this learning phase, providers continued delivering services but did not submit recordings of EI visits. They also had opportunities to meet with their PDSs individually for additional support and discussion. PDSs documented on the program-developed end of cohort review checklist, providers' completion of required discovery phase components and readiness for the discovery phase end survey.

### CEITMP Mentorship Phase

The mentorship phase of the CEITMP lasted 10 weeks, centered on providers learning about the KCAR-R, and aimed to support them to apply their developing knowledge of caregiver coaching. This second phase included the

continuation of monthly group meetings, opportunities to engage with targeted

resources (e.g., articles, exemplar videos, program materials), and focus on

different components of caregiver coaching each week (see Figure 3). Providers

video recorded their EI visits, and used TORSH Talent™ to complete time-

synced, self-assessments on segments of their sessions, to identify and reflect

on evidence of each KCAR-R coaching quality indicator (CQ). PDSs reviewed

providers' video clips and self-assessments, rated them, and offered written,

time-synced performance feedback within TORSH Talent™ on adherence to

caregiver coaching guided by the descriptors on the KCAR-R. PDSs documented

on the program-developed end of cohort review checklist, providers' completion

of required mentorship phase components and readiness for the mentorship end

phase survey.

### *CEITMP Fidelity Phase*

Providers focused on refining their skills to implement caregiver coaching

with fidelity in this third, six-week phase. They met with their group and mentoring

PDS once, had opportunities to access targeted resources and complete a

written reflection on the development of their caregiver coaching practices, and

recorded entire EI sessions with families who had signed consent. In the first

week of fidelity phase, providers self-assessed their caregiver coaching skills in

an entire EI session according to the KCAR-R; they submitted their video and

self-assessment to their mentoring PDS who provided time-synced written

performance feedback according to the descriptors on the KCAR-R. To reduce

the risk of bias and offer additional perspectives, non-mentoring PDSs were

randomly assigned to rate and offer performance feedback on subsequent video submissions in the fourth and sixth weeks of fidelity phase. All providers in the program were required to submit three videos for performance feedback; the highest two scores from videos 1-3 were combined to inform the timing of their first maintenance video due date after completing the CEITMP, which is further elaborated in the maintenance section below. To reward efforts and achievements, providers who demonstrated fidelity to coaching on their first two submissions received the option to forgo submitting a third video. Conversely, providers who did not demonstrate fidelity to caregiver coaching on their first three attempts were offered additional support and continued to submit videos until they met the standard of fidelity to caregiver coaching. All providers included in this study demonstrated fidelity to coaching within four video submissions.

### CEITMP Professional Development Phase

After demonstrating the ability to coach with fidelity providers entered the final three weeks of the CEITMP in which they reflected on their baseline video, had their final group meeting, submitted a PD plan, and completed the exit survey. These activities of the professional development plan were designed to support providers to prepare to sustain their use of caregiver coaching practices with fidelity and expand their web of support among other EI providers. After completing the CEITMP, providers entered maintenance, the state's approach to supporting sustained fidelity to coaching practices. PDSs documented providers' completion of required program components and readiness for the exit survey on the program-developed end of cohort review checklist.

*CEITMP Maintenance Phase*

The purpose of maintenance was to sustain the momentum and consistency of using a defined set of caregiver coaching skills in their EI practice. The timing and frequency of these initial maintenance checks were determined by the performance of providers while in program, with higher scores on the KCAR-R in fidelity phase resulting in a longer time span between the end of the program and the first maintenance period. In maintenance, providers periodically submitted a recorded EI visit to be assessed for continued fidelity to caregiver coaching. PDSs reviewed providers' videos and self-assessments, rated them, and offered written, time-synced performance feedback on adherence to caregiver coaching guided by the descriptors on the KCAR-R.

The CEITMP team developed additional supports in maintenance to promote success and supplement the strategies providers identified in their PD plan. PDSs developed and distributed a multi-media, quarterly newsletter by listserv which highlighted caregiver coaching content identified by the CEITMP and providers as needs. The SLA and CEITMP team began informational communication three months prior to providers' maintenance period. Providers were granted TORSH Talent™ accounts the month prior to their maintenance period to access exemplar clips, CQ introduction videos, and the self-assessment tool within the platform. A 90-minute, optional virtual monthly maintenance group refresher meeting was offered, which was facilitated by two PDSs and focused on the KCAR-R and providers' individual questions. Providers were strongly encouraged to engage with targeted supports and suggested

additional resources when fidelity was not met on maintenance initial video submissions. At the end of each month, the maintenance lead documented completed procedures in a program-developed checklist and the maintenance co-lead verified to ensure implementation fidelity.

**Research Design**

Given the real-world nature of the existing data obtained from the CEITMP, identifying a specific research design presented with challenges. True experimental designs require randomization of participants to groups, demonstrate maximum control over extraneous variables, and include manipulation of the independent variable; quasi-experimental research allows for use of existing groups and demonstrates some control over extraneous variables; and pre-experimental research designs allow for existing groups and demonstrates no control over extraneous variables (Ary et al., 2010; Panacek & Thompson, 1995). Experimental designs can infer cause-and-effect relationships. Correlational designs require dependent and independent variables be continuous to assess relationships (Field, 2013). Retrospective cohort and case series study designs, commonly employed in the health sciences field (Hulley et al., 2013), compare outcomes for groups of individuals associated with exposure and non-exposure to elements after the fact (Panacek & Thompson, 1995). These research designs were not appropriate to analyze the CEITMP extant data.

I analyzed data on 17 cohorts of KEIS providers who completed the state mandated CEITMP and had access to the same supports and recommended

maintenance preparatory activities between November 30, 2018, and November 30, 2022, using ex post facto research (Ary et al., 2010) study design. This research design has also been referred to as causal-comparative and is the closest fit for the research questions of interest, as it can be conducted with existing data in which randomization of participants and manipulation of variables is not permitted, ethical, or possible (Ary et al., 2010). It is important to note that inferences about causal relationships within an ex post facto research design are made with maximal caution (Ary et al., 2010) due to the level of scientific rigor (Panacek & Thompson, 1995). To attempt to control for threats to internal validity, data for individual providers were examined across three key PD assessment markers; therefore, participants served as their own control, and differences in fidelity to caregiver coaching skills between homogeneous groups were explored by discipline, years' experience, cohort, launch group, and engagement in recommended maintenance preparatory activities.

**Participants and Sampling Plan**

The University of Louisville is contracted to deliver the CEITMP (2022a). The CEITMP commenced in 2017 with a team including three experienced early interventionists, one of which was this researcher, the program director who also served as a mentor, and a project coordinator who provided organizational and technical support to the team and providers. Two external consultants supplemented training and mentored the initial three PDSs. As part of the scaling up and sustainability plan, one early interventionist filled a PDS vacancy, and three early interventionists were added as PDSs to the team.

To transition into the PDS role, the experienced EI providers engaged in a series of multi-component learning activities. They began by reviewing literature on caregiver coaching in early intervention (i.e., Dunn et al., 2012; Dunn et al., 2018; Foster et al., 2013; Jayaraman et al., 2015; Rush et al., 2003; Rush & Shelden, 2011) and mentoring (i.e., Fazel, 2013; Neuman & Cunningham, 2009; Rush & Shelden, 2011; Watson & Gatti, 2012). They completed eLearning modules on the topics of caregiver coaching; home and community visits in EI; using a primary coach approach; using activities, routines, and materials in the natural environment; and strengths (Dunn & Pope, 2017). Additionally, they participated in individual written and group verbal reflective activities; self-assessed caregiver coaching practices on their recorded EI visits; received performance feedback; provided performance feedback on their caregiver coaching skills; developed a caregiver coaching fidelity tool; and engaged in interactive, virtual small group coaching sessions weekly with mentors. Training and mentorship lasted six months and was determined complete after each PDS demonstrated fidelity to caregiver coaching according to the KCAR-R and acknowledged confidence in mentoring. At the time of this manuscript, the cross-disciplinary CEITMP PD team was comprised of a PT, an OT who serves as the program director, two SLPs, three DIs, one of whom is a Teacher for the Deaf and Hard of Hearing, and a coordinator with a behavioral health background. All maintained requisite licenses and certifications for their respective disciplines.

Providers are independent contractors, subcontractors, or agency employees with vendor agreements with the Kentucky Cabinet for Health and

Family Services to provide services to KEIS eligible infants and toddlers, and their families. This vendor agreement stipulates participation in the CEITMP by all ongoing cross-disciplinary service providers (i.e., DIs, OTs, PTs, and SLPs). Providers reside and provide services across different regions of the state. Services are offered in the environments natural to children and families via tele-intervention, face-to-face, or hybrid formats. This researcher estimates there are approximately 500 active ongoing service providers in the KEIS; however, no public data on this population is available at this time. This study used a convenience, nonprobability sampling method to investigate existing data for 264 KEIS providers who had completed the CEITMP by November 2022, including those who have completed their initial maintenance period; therefore, participants were not selected or recruited.

**Measures**

***EI Provider Characteristics at CEITMP Enrollment***

Providers completed a required survey at the onset of each CEITMP cohort enrollment, to provide contact information, professional discipline, years of experience in EI, availability for monthly meetings, and answer an open-ended question requesting a description of their current EI practices. They also had the option to request to be placed in a group with colleagues. The independent variables of professional discipline, years of EI experience, cohort, and launch group were examined in this study.

***KCAR-R***

The CEITMP team used current evidence in the field (DEC RPs, 2014; Kemp & Turnbull, 2014; Rush & Shelden, 2020; Workgroup on Principles and Practices in Natural Environments, 2008), to iteratively develop the KCAR-R (Coaching in Early Intervention Training and Mentorship Program, 2022b), as seen in Appendix C. The base language for the fidelity tool was developed by the mentor and consultants, expanded by the CEITMP team, and refined during field testing and when establishing reliability. The KCAR-R consists of seven defined coaching quality indicators (CQs) reflecting key behaviors that EI providers utilize to coach caregivers of infants and toddlers at risk of or with developmental differences, striving to build their confidence and competence to support their children's learning and development. For example, CQ1 captures the key behavior of fostering trusting relationships when partnering with caregivers by connecting, listening, and responding in respectful, supportive ways, and CQ2 focuses on developing a detailed two-part joint plan for the visit focused on the caregiver's priority. Each CQ features behavioral descriptors, representing a continuum of EI provider caregiver coaching quality on a Likert-type scale, with ratings of 0 = *not yet*; 1 = *knowledge*; 2 = *awareness*; 3 = *application*; and 4 = *mastery*.

To support consistent KCAR-R scoring, the CEITMP team developed a scoring guide for PDS reference, and reliability scoring by a second trained observer from the team was completed across 20% of full videos submitted by EI providers following a completed phase. The criterion for reliability was established as both observers scoring exactly the same on at least four of the

seven CQs and within one on the remaining CQs. Intraclass correlation coefficients (ICC) are frequently used to index interrater reliability, with values above 0.60 considered good and above 0.80 very good (Marshall & Boggis, 2016). The CEITMP confirmed reliability biannually, with the most recent reliability check of 187 videos checked across 8 raters. ICC (2, 1) estimates with absolute agreement and 95% confidence intervals as 0.97 (0.90 – 0.977) were calculated using IBM Statistical Package for the Social Sciences (SPSS) version 28, demonstrating very good agreement at the full video level (i.e., KCAR-R total score). Raters also showed very good reliability at the individual CQ level as ICC (2,1) estimates with absolute agreement and 95% confidence intervals ranged from 0.86 to 0.94. During development and implementation of the KCAR-R, observers have maintained reliability across 20% of video submissions. The KCAR-R is in the process of being validated and will be submitted for publication. The dependent variable, KCAR-R scores, across the independent variable of key assessment markers of baseline, in program, and maintenance are examined in this study.

Providers submitted video recordings of their EI visits on a designated schedule prior to beginning, during, and following completion of the CEITMP. Trained observers from the CEITMP team used the KCAR-R to rate EI providers' level of fidelity to the defined set of caregiver coaching practices. While viewing entire video recorded EI sessions, CEITMP team raters evaluated providers application of the seven CQs and assigned each CQ a score from 0 to 4. Adherence to quality coaching practices was assessed by combining scores

across all seven CQs for one entire EI visit, with a possible minimum total summed score of 0 and maximum of 28. A cut score of 18 with all CQs at the awareness, application, and/or mastery levels (i.e., 2, 3, 4) was indicative of fidelity to coaching. All full video scores were recorded to the CEITMP data spreadsheet by the rater immediately following video scoring.

*CEITMP Program Data*

A statewide plan developed by the CEITMP team in conjunction with the SLA outlined the pre-determined timeline for each cohort to begin the PD by launch group (i.e., designated districts). At the time of this review, five groups had been launched and as each cohort enrolled, the coordinator entered the provider's cohort and district into the master file. The coordinator generated a report monthly from TORSH Talent™ indicating providers who accessed exemplar videos. I entered the data from the TORSH Talent™ report as well as providers who attended the maintenance refresher group meeting into the master maintenance period schedule spreadsheet file each month. As providers completed required CEITMP activities, PDSs verified completed products were saved, and entered information such as PDS support level provided of length of time between CEITMP completion and initial maintenance period into the end of cohort review file.

**Data Collection**

Prior to beginning this research project, I received approval from the University of Louisville Institutional Review Board (IRB) to amend my current, approved IRB study to include new questions and variables; Appendix D contains

the variable list, and Appendix E the variable codes. For these retrospective analyses, I compiled data pertinent to my research questions into a master Microsoft Excel file from existing program documents for the first 17 cohorts that completed the CETIMP. First, I pulled relevant participant demographics (i.e., professional discipline, years of EI experience, cohort, launch number) from the CEITMP statewide rollout master file. Next, I extracted baseline, fidelity, and maintenance KCAR-R scores from the CEITMP data spreadsheet. Then I retrieved data from the CEITMP maintenance period schedule spreadsheet to identify maintenance providers who accessed exemplar videos according to CEITMP TORSH reports, as well as those who attended maintenance refresher group meetings. Lastly, I obtained PDS CEITMP implementation fidelity information, PDS support level, and length of time between CETIMP completion and initial maintenance period from the end of cohort review file. Following consolidation of all data into a single master Microsoft Excel file, the CEITMP program director randomly selected 20% of the items and validated data entry and de-identified the participants before I imported the data into SPSS version 28. The master file is stored and maintained by the CEITMP at the University of Louisville.

**Data Analysis**

Descriptive statistics were used to organize, summarize, and describe data in terms of sample size, group(s), frequency distributions, raw scores, mean scores, and standard deviations (Ary et al., 2010). A within-subjects, repeated measures analysis of variance (ANOVA) was employed to focus on changes in

provider caregiver coaching skills across key PD assessment markers, which is appropriate when measuring performance trends for the same participant across two or more data points (Field, 2013; Pituch & Stevens, 2015). Repeated measures can capture a sequence of real-world experiences for a cohort across time (Ary et al., 2010) and is conducive to analysis of retrospective data for participants that have been grouped for purposes other than a research experiment (Hulley et al., 2013). A one-way ANOVA was used to determine the presence of statistically significant differences between KEIS provider groups (i.e., discipline, years' EI experience, cohort, launch) as well as those who engaged in optional recommended activities prior to submitting a maintenance video and those who did not. This approach is appropriate to analyze variations of one independent variable and different levels of the dependent variable (Ary et al., 2010; Field, 2013; Tabachnick & Fidell, 2013).

To address research question one, I conducted a within-subjects, repeated measures ANOVA to examine changes in providers' caregiver coaching skills according to the KCAR-R across three key CEITMP assessment markers: baseline, following high-intensity training and mentorship, and initial maintenance period. The first marker was providers' baseline video recording of a full EI session, submitted up to three months prior to beginning the CEITMP. The second marker was the first video recording of a full EI session completed after 23 weeks of high-intensity training and mentorship. Lastly, the third marker was the first video submission in providers' initial maintenance period, which ranged from three to 18 months following their CEITMP completion. I used descriptive

statistics and histograms to examine the normality assumption, and Mauchly's

test to confirm the sphericity assumption. The significance value for hypothesis

testing was established as $p < .05$. Following obtaining a statistically significant

$F$-value, partial eta squared was used to determine effect size, with $\eta_p^2=.01$

indicating a small effect, $\eta_p^2=.06$ a medium effect, and $\eta_p^2=.14$ a large effect. A

post-hoc pairwise comparison examining repeated contrasts was facilitated to

detect differences between groups across assessment markers. Cohen's $d$

(1992) was calculated to measure the magnitude of statistically significant

findings of changes in caregiver coaching skills, with $d = 0.2$ indicating a small

effect, $d = .5$ a medium effect, and $d = .8$ a large effect. Given Childress et al.

(2021) found statistically significant changes in EI providers knowledge and use

of adult learning strategies after a six-week PD, with a large effect size, I

expected to find a statistically significant change in providers' practices after

participation in a high-quality PD with a similar effect, and slippage in

maintenance.

For research question two, I used a one-way ANOVA to examine

differences in providers' caregiver coaching skills according to the KCAR-R

based on group characteristics including discipline, years' EI experience, cohort,

and launch group. I explored differences across three key CEITMP assessment

markers: baseline, following high intensity training and mentorship, and first

maintenance period, completed within a span of 10 months to two years, and by

group characteristic. I used descriptive statistics and histograms to examine the

normality assumption and Levene's test to confirm the homogeneity of variance

assumption. The significance value for hypothesis testing was established as $p <$ .05. Following obtaining a statistically significant *F*-value, eta squared was used to determine effect size. Post-hoc analyses using Tukey's test were conducted when a statistically significant *F*-value was obtained to explore specific group differences. When indicated, Cohen's *d* (1992) was again calculated to measure the magnitude of statistically significant findings. Since Campbell and Sawyer (2009) reported no significant differences in participation-based practices based on provider discipline or years of experience, I hypothesized that there would be no differences in providers' caregiver coaching skills according to provider characteristics. I did expect that there would be statistically significant differences between cohorts and launch groups due to changes made to the CEITMP during improvement cycles.

To address research question three, I conducted a one-way ANOVA to determine the presence of statistically significant differences in caregiver coaching skills, as measured by the KCAR-R, for four independent groups of providers' who engaged in recommended, optional maintenance preparatory activities at varying levels. I used descriptive statistics and histograms to examine the normality assumption and Levene's test to confirm the homogeneity of variance assumption. The significance value of the one-way ANOVA was established as $p <$ .05. Tukey's test was used as a post-hoc comparison and Cohen's *d* (1992) informed the effect size for any statistically significant findings of recommended maintenance preparatory activities. I hypothesized statistically

significant differences in EI providers' caregiver coaching skills would be found based on level of engagement in recommended preparatory activities.

For research question four, I used a one-way ANOVA to determine the presence of statistically significant differences in caregiver coaching skills, as measured by the KCAR-R, on providers' initial maintenance video submission based on the length of time that occurred following their completion of the CEITMP (i.e., 2-4 months, 5-8 months, 9 months, 12, months). I used descriptive statistics and histograms to examine the normality assumption and Levene's test to confirm the homogeneity of variance assumption. The significance value of the one-way ANOVA was established as $p < .05$. Tukey's test was used as a post-hoc comparison and Cohen's $d$ (1992) determined the effect size for statistically significant findings. I hypothesized there would be statistically significant differences in EI providers' caregiver coaching skills between the groups that had a short distance to initial maintenance period and those who had a longer time.

For research questions five and six, I obtained descriptive statistics and organized them to present in tables. First, PDSs' CEITMP implementation fidelity was addressed, with a minimal level of fidelity established at 80%. Lastly, PDS level of support for EI providers' successful program completion was reported.

CHAPTER 4 RESULTS

In this chapter, I delved into the results of CEITMP extant data collected

on KEIS providers' sustained intervention fidelity to caregiver coaching practices

and PDSs' fidelity to implementing a mandatory, multi-component, evidence-

informed PD program. The participant characteristics are described, and results

organized by research question.

**Participant Characteristics**

I included participants in this study who met the inclusion criteria of

completing one of the first 17 CEITMP cohorts and demonstrating fidelity to

caregiver coaching within their first four fidelity phase video submissions. One

outlier was identified, deemed invalid, and excluded. The demographics and

descriptive statistics at key assessment markers for the remaining 264 EI

providers are described by group in Table 3. Most EI providers were SLPs,

followed by DI, OT, and PT; and two of the 49 OT EI providers were certified

occupational therapy assistants (COTAs), licensed by the same state board, and

supervised by OTs working in KEIS. Providers reported years of EI experience at

the time of enrollment in the CEITMP, ranging from zero months and 32 years.

Experience was grouped into four categories: (1) less than 3 years, (2) 3-9 years,

(3) 10-19 years, (4) 20 or more years. A total of 17 cohorts ranging in size from 3

to 27 participants were included in this retrospective review. The training of one

replacement and two additional PDSs coupled with COVID-19, guided enrollment

size for cohorts five through ten. Finally, data on each of the five launched

groups is provided given the use of AIF improvement cycles to continuously

refine the CEITMP.

**Table 3**

*CEITMP Group Descriptive Statistics at Key Assessment Markers*

| Group | Baseline | | | Post intensive training/mentorship | | | First maintenance period | | |
|---|---|---|---|---|---|---|---|---|---|
| | *N* | *%* | *M (SD)* | *N* | *%* | *M (SD)* | *N* | *%* | *M (SD)* |
| Discipline | | | | | | | | | |
| DI | 82 | 31.1 | 7.45 (3.86) | 80 | 31.3 | 18.63 (3.43) | 54 | 32.7 | 17.89 (3.61) |
| OT [a] | 49 | 18.6 | 8.67 (4.18) | 47 | 18.4 | 19.74 (3.63) | 31 | 18.8 | 19.26 (3.50) |
| PT | 25 | 9.5 | 9.48 (4.72) | 25 | 9.8 | 20.20 (3.37) | 14 | 8.5 | 20.21 (3.45) |
| SLP | 108 | 40.9 | 7.95 (4.37) | 104 | 40.6 | 19.50 (3.83) | 66 | 40.0 | 19.89 (3.54) |
| Years' Exp | | | | | | | | | |
| < 3 | 68 | 25.8 | 8.06 (4.46) | 67 | 26.2 | 18.45 (3.37) | 39 | 23.6 | 18.79 (3.75) |
| 3-9 | 98 | 37.1 | 7.82 (4.15) | 94 | 36.7 | 19.82 (3.51) | 54 | 32.7 | 18.70 (3.66) |
| 10-19 | 64 | 24.3 | 8.63 (4.35) | 61 | 23.8 | 19.31 (3.91) | 49 | 29.7 | 19.14 (3.61) |
| 20+ | 34 | 12.9 | 7.82 (3.88) | 34 | 13.3 | 19.82 (3.88) | 23 | 13.9 | 20.78 (3.16) |
| Cohort | | | | | | | | | |
| 1 | 9 | 3.4 | 8.33 (4.33) | 9 | 3.5 | 16.56 (3.13) | 9 | 5.5 | 17.44 (4.16) |
| 2 | 15 | 5.7 | 4.47 (4.21) | 8 | 3.1 | 17.13 (2.30) | 14 | 8.5 | 18.50 (3.96) |
| 3 | 23 | 8.7 | 6.43 (3.53) | 23 | 9.0 | 18.09 (4.19) | 21 | 12.7 | 18.00 (3.78) |
| 4 | 15 | 5.7 | 7.13 (4.93) | 15 | 5.9 | 16.93 (2.34) | 14 | 8.5 | 17.29 (3.10) |
| 5 | 9 | 3.4 | 7.56 (3.32) | 9 | 3.5 | 17.22 (3.63) | 5 | 3.0 | 17.40 (3.98) |
| 6 | 6 | 2.3 | 9.33 (3.08) | 6 | 2.3 | 20.50 (3.78) | 5 | 3.0 | 21.00 (2.74) |
| 7 | 9 | 3.4 | 6.56 (3.09) | 9 | 3.5 | 17.56 (4.72) | 8 | 4.8 | 17.00 (3.07) |
| 8 | 3 | 1.1 | 5.33 (1.53) | 3 | 1.2 | 19.67 (1.53) | 3 | 1.8 | 20.67 (2.08) |
| 8.5 | 10 | 3.8 | 7.90 (3.67) | 10 | 3.9 | 21.20 (3.86) | 8 | 4.8 | 21.50 (4.11) |
| 9 | 13 | 4.9 | 8.23 (2.95) | 13 | 5.1 | 19.54 (3.41) | 11 | 6.7 | 20.73 (2.87) |
| 10 | 3 | 1.1 | 7.67 (0.58) | 3 | 1.2 | 19.67 (1.16) | 3 | 1.8 | 20.67 (4.04) |
| 11 | 26 | 9.8 | 10.08 (3.44) | 25 | 9.8 | 18.60 (3.74) | 24 | 14.5 | 20.13 (3.14) |
| 12 | 19 | 7.2 | 11.11 (5.07) | 19 | 7.4 | 19.95 (3.52) | 16 | 9.7 | 20.44 (3.46) |
| 13 | 25 | 9.5 | 8.80 (3.98) | 25 | 9.8 | 20.00 (3.24) | 16 | 9.7 | 19.44 (3.03) |
| 14 | 25 | 9.5 | 8.36 (4.16) | 25 | 9.8 | 20.44 (2.95) | 5 | 3.0 | 18.80 (6.18) |
| 15 | 27 | 10.2 | 8.00 (4.80) | 27 | 10.5 | 21.11 (3.84) | 3 | 1.8 | 18.67 (0.58) |
| 16 | 27 | 10.2 | 7.74 (4.31) | 27 | 10.5 | 20.37 (3.12) | 0 | | |
| Launch | | | | | | | | | |
| 1 | 56 | 21.2 | 6.39 (3.96) | 49 | 19.1 | 17.49 (3.61) | 49 | 29.7 | 17.98 (3.82) |
| 2 | 15 | 5.7 | 7.13 (4.93) | 15 | 5.9 | 16.93 (2.34) | 14 | 8.5 | 17.29 (3.10) |
| 3 | 89 | 33.7 | 9.13 (3.91) | 88 | 34.4 | 19.42 (3.69) | 78 | 47.3 | 20.19 (3.32) |
| 4 | 50 | 18.9 | 8.58 (4.04) | 50 | 19.5 | 20.22 (3.07) | 21 | 12.7 | 19.29 (3.82) |
| 5 | 54 | 20.5 | 7.87 (4.52) | 54 | 21.1 | 20.74 (3.48) | 3 | 1.8 | 18.67 (0.58) |
| Total | 264 | 100 | 8.08 (4.23) | 256 | | 19.34 (3.65) | 16 | | 19.15 (3.64) |

**Research Question One**

For research question one, I used a within-subjects repeated measures ANOVA to examine changes in caregiver coaching skills measured by the KCAR-R, across baseline, immediately following high-intensity training and mentorship, and first maintenance period PD assessment markers. Although 264 participants met inclusion criteria for the study, only 157 had data points for all three key assessment markers. The initial maintenance video score examining sustained caregiver coaching skills was my primary variable of interest in this question. Descriptive statistics in Table 4 and histograms showed normally distributed data (Pallant, 2020). Mauchly's test of sphericity indicated the assumption of sphericity had been violated, $X^2(2) = 6.34$, $p = .042$; therefore, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon = .96$) to decrease the likelihood of a Type one error (Field, 2013). The results showed statistically significant differences $F(1.92, 299.97) = 726.93$, $p < .001$, in the average KCAR-R scores for EI providers coaching caregivers from baseline to immediately following high intensity training to first maintenance period, with a large effect ($\eta_p^2 = .82$) and a power of 1.0. Post-hoc pairwise comparisons examining repeated contrasts showed that a substantial increase in caregiver coaching skills occurred between baseline and high intensity training and mentorship $F(1, 156) = 1065.43$, $p < .001$, with a large effect ($d = 2.86$), and a power of 1.0. The magnitude of the effect size highlights the impressive growth

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seen in EI providers' coaching practices from their baseline video submission to immediately following high-intensity training and mentorship, while the power confirms the presence of the statistically significant difference. Statistically significant differences in fidelity to caregiver coaching skills was also noted when analyzing scores from immediately following high intensity training and mentorship to first maintenance period $F(1, 156) = 8.38$, $p < .004$, with post-hoc pairwise analysis using repeated contrast indicating a small effect ($d = 0.25$), and a power of .82.

**Table 4**

*Descriptive Statistics for Key Assessment Markers*

| Key CEITMP assessment marker | *N* | *M* | *SD* |
|---|---|---|---|
| Baseline | 157 | 7.80 | 3.82 |
| Post high-intensity training and mentorship | 157 | 18.32 | 3.53 |
| Initial maintenance video | 157 | 19.22 | 3.65 |

**Research Question Two**

I used a one-way ANOVA in research question two to explore differences in providers' fidelity to a defined set of caregiver coaching skills at key PD assessment markers based on their characteristics. All 264 participants were included in the analyses. Descriptive statistics outlined in Table 3 and histograms indicated normally distributed data and Levene's test confirmed the assumption of homogeneity of variance at each key PD assessment point: baseline, immediately following high-intensity training and mentorship, and first

maintenance period, for each group characteristic: discipline, years' EI experience, cohort, and launch group. Table 5 summarizes analyses by group demographic and key PD assessment marker. No statistically significant differences were noted between groups when considering years of EI experience, establishing these groups demonstrated relatively similar abilities to adhere to a defined set of coaching skills across key PD assessment points. Statistically significant differences were however detected between discipline groups at the initial maintenance period, and cohort and launch groups across assessment markers; therefore, Tukey's test was used for post hoc comparisons to note specific groups variances.

**Table 5**

*Analysis of Variance Results by Group at Key Assessment Markers*

| Group | Baseline | | | | Post intensive training/mentorship | | | | First maintenance period | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *df* | *F* ratio | *p* | $\eta^2$ | *df* | *F* ratio | *p* | $\eta^2$ | *df* | *F* ratio | *p* | $\eta^2$ |
| Discipline | 3, 260 | 1.88 | .132 | | 3, 252 | 1.76 | .154 | | 3, 161 | 3.66 | .014* | .06 |
| Years | 3, 260 | 0.51 | .669 | | 3, 252 | 2.10 | .100 | | 3, 161 | 1.97 | .120 | |
| Cohort | 16, 247 | 2.35 | .003* | .13 | 16, 239 | 2.70 | <.001* | .15 | 15, 149 | 1.69 | .058 | |
| Launch | 4, 259 | 4.19 | .003* | .06 | 4, 251 | 8.39 | <.001* | .12 | 4, 160 | 4.10 | .003* | .09 |

*Note.* Years = years' early intervention experience.
*$p < .05$

Post-hoc analysis using Tukey's test highlighted a statistically significant difference between DIs (*M* = 17.89, *SD* = 3.61) and SLPs (*M* = 19.89, *SD* = 3.54) at the initial maintenance video assessment marker with a medium effect (*d* = 0.56). SLPs' average KCAR-R score was two points higher than that of DIs.

Statistically significant differences detected between cohorts with Tukey's test are highlighted in Table 6. Figure 4 shows the pattern of baseline scores for cohorts with cohort 12 having the highest KCAR-R average and cohort 2 the lowest. Figure 5 shows the pattern of KCAR-R scores immediately following high intensity training and mentorship, with cohort 15 demonstrating the highest KCAR-R average and cohort 4 the lowest. No statistically significant differences were detected between cohorts in the first maintenance period, and the pattern of KCAR-R scores are shown in Figure 6 and include cohort 6 with the highest mean score and cohort 7 the lowest.

**Table 6**

*Significant Differences Detected in Cohorts*

| Assessment marker difference | Cohort | *N* | *M* | *SD* | Cohort | *N* | *M* | *SD* | *Sig* | *d* |
|---|---|---|---|---|---|---|---|---|---|---|
| Baseline difference 1 | 12 | 19 | 11.11 | 5.07 | 2 | 15 | 4.47 | 4.21 | <.001 | 1.43 |
| Baseline difference 2 | 12 | 19 | 11.11 | 5.07 | 3 | 23 | 6.43 | 3.53 | .026 | 1.07 |
| Baseline difference 3 | 11 | 26 | 10.08 | 3.44 | 2 | 15 | 4.47 | 4.21 | .003 | 1.46 |
| Post intensive training/mentorship difference 1 | 15 | 27 | 21.11 | 3.84 | 4 | 15 | 16.93 | 2.34 | .022 | 1.31 |

**Figure 4**

*Cohort KCAR-R Averages at Baseline*
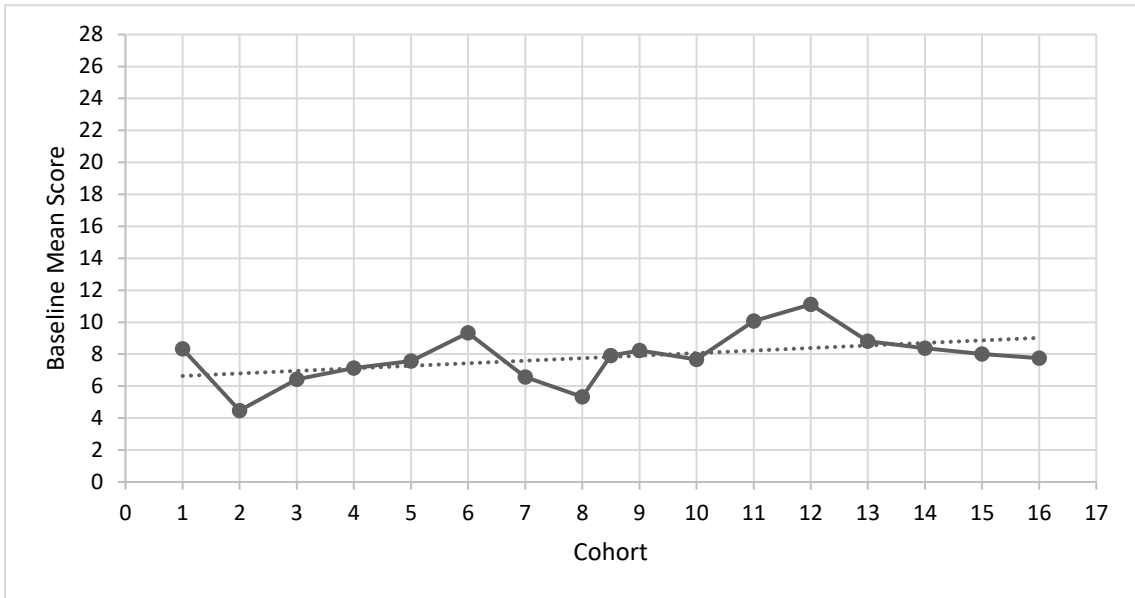


*Note.* KCAR-R Kentucky Coaching Adherence Rubric-Revised.

**Figure 5**

*Cohort KCAR-R Averages Post Training and Mentorship*
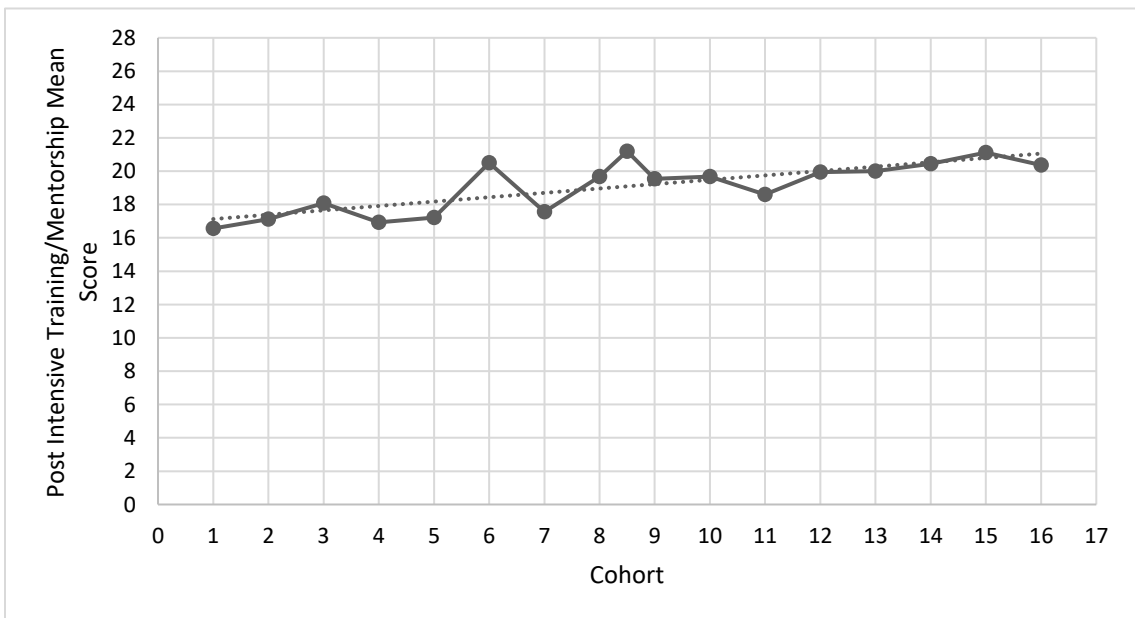


*Note.* KCAR-R Kentucky Coaching Adherence Rubric-Revised.

**Figure 6**

*Cohort KCAR-R Averages on First Maintenance Submission*
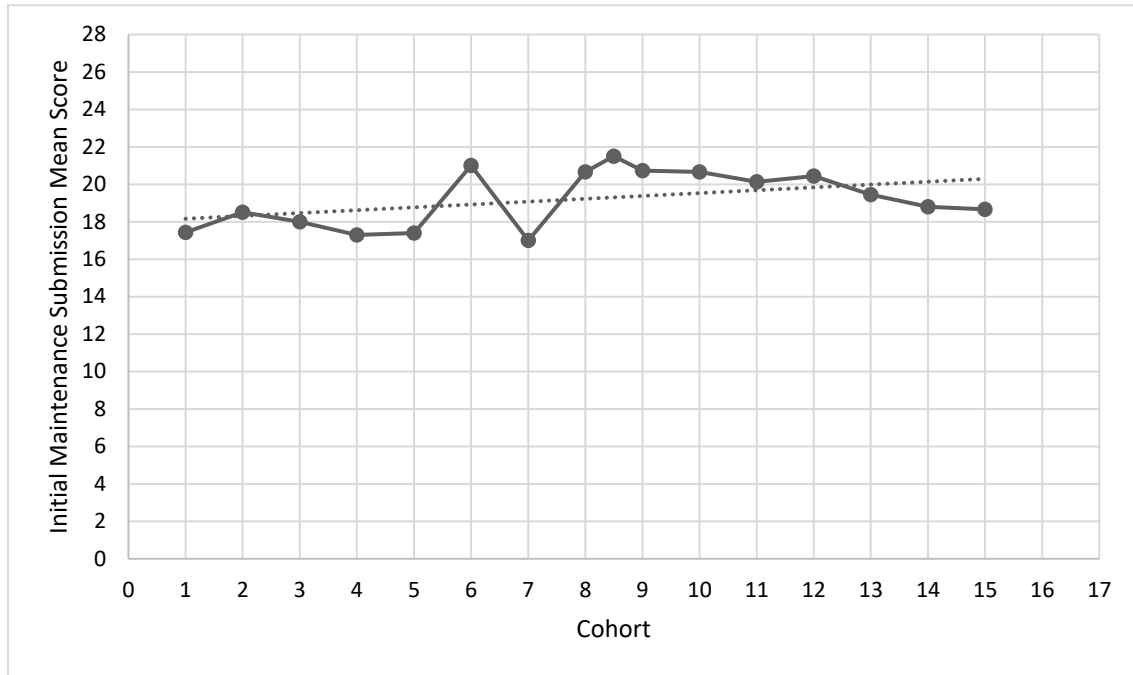


*Note.* KCAR-R Kentucky Coaching Adherence Rubric-Revised.

Statistically significant differences were also found between launch groups, as shown in Table 7. At baseline, launch group average scores ranged from 6.39 ($SD = 3.96$) to 9.13 ($SD = 3.91$). Launch group 1 had the lowest mean score and differed statistically from launch group 3 with the highest mean score. Figure 7 shows the pattern of average KCAR-R baseline scores for the five launch groups. As shown in Figure 8, except for the second launch group, mean scores steadily increased across launch groups immediately following high intensity training and mentorship. Launch group one demonstrated the lowest average KCAR-R score (M = 17.49, SD = 3.61) and the most recent launch group (i.e., five) demonstrated the highest average (M = 20.74, SD = 3.481).

**Table 7**

*Significant Differences Detected in Launch Groups*

| Assessment marker difference detected | Launch group | N | M | SD | Launch group | N | M | SD | Sig | d |
|---|---|---|---|---|---|---|---|---|---|---|
| Baseline difference 1 | 1 | 56 | 6.39 | 3.96 | 3 | 89 | 9.13 | 3.91 | .001 | 0.70 |
| Post intensive training/mentorship difference 1 | 1 | 49 | 17.49 | 3.61 | 3 | 88 | 19.42 | 3.69 | .016 | 0.53 |
| Post intensive training/mentorship difference 2 | 1 | 49 | 17.49 | 3.61 | 4 | 50 | 20.22 | 3.07 | .001 | 0.81 |
| Post intensive training/mentorship difference 3 | 1 | 49 | 17.49 | 3.61 | 5 | 54 | 20.74 | 3.48 | <.001 | 0.92 |
| Initial maintenance period difference 1 | 1 | 49 | 17.98 | 3.82 | 3 | 78 | 20.19 | 3.32 | .006 | 0.62 |
| Initial maintenance period difference 2 | 2 | 14 | 17.29 | 3.10 | 3 | 78 | 20.19 | 3.32 | .038 | 0.90 |

**Figure 7**

*Launch Group KCAR-R Averages at Baseline*
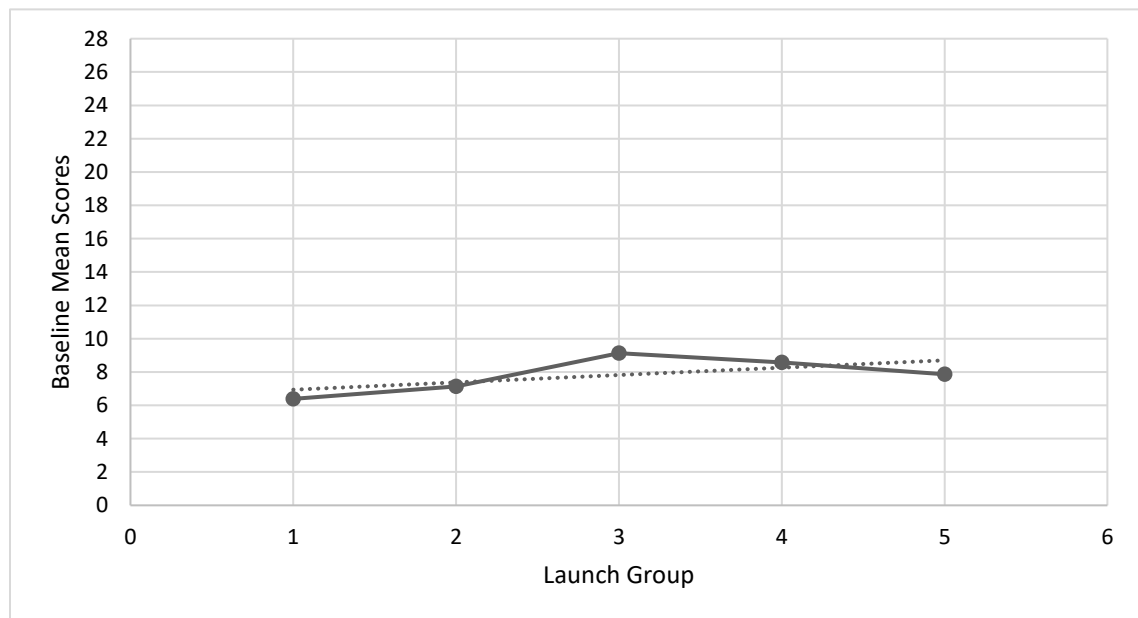


*Note.* KCAR-R Kentucky Coaching Adherence Rubric-Revised.

**Figure 8**

*Launch Group KCAR-R Averages Post Training and Mentorship*
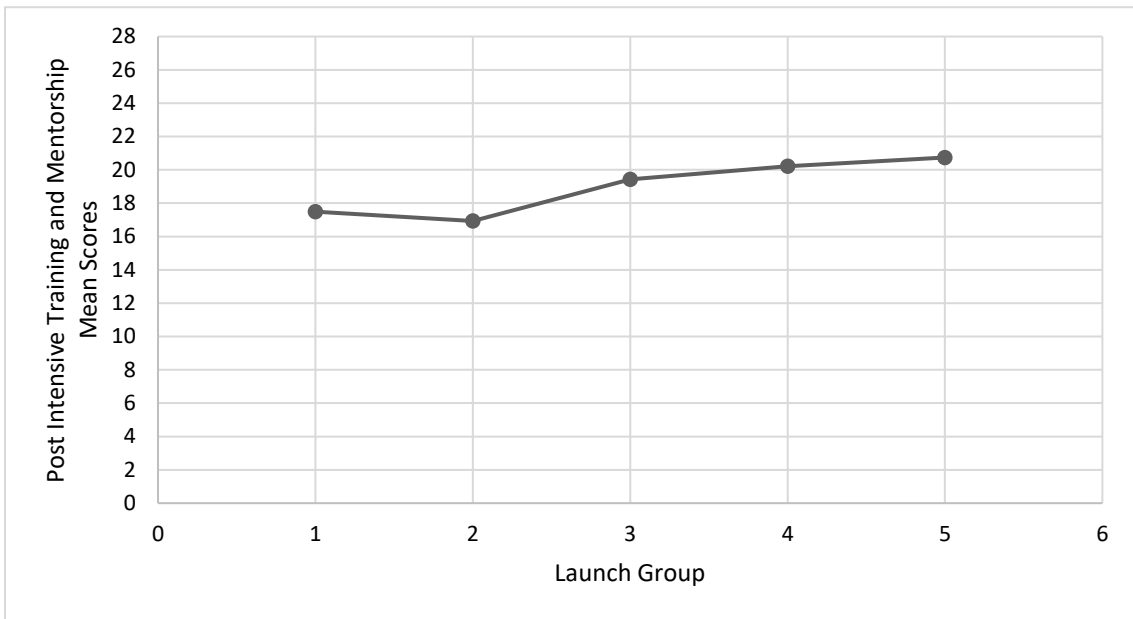


*Note.* KCAR-R Kentucky Coaching Adherence Rubric-Revised.

Figure 9 shows the pattern of initial maintenance period mean scores for launch groups 1-5. Launch group 3 had the highest KCAR-R mean scores ($M = 20.19$, $SD = 3.32$) and differed statistically from the two lowest performing launch groups, launch group 2 ($M = 17.98$, $SD$ 3.82) and launch group 3 ($M = 17.29$, $SD = 3.10$).

**Figure 9**

*Launch Group KCAR-R Averages at Initial Maintenance Period*
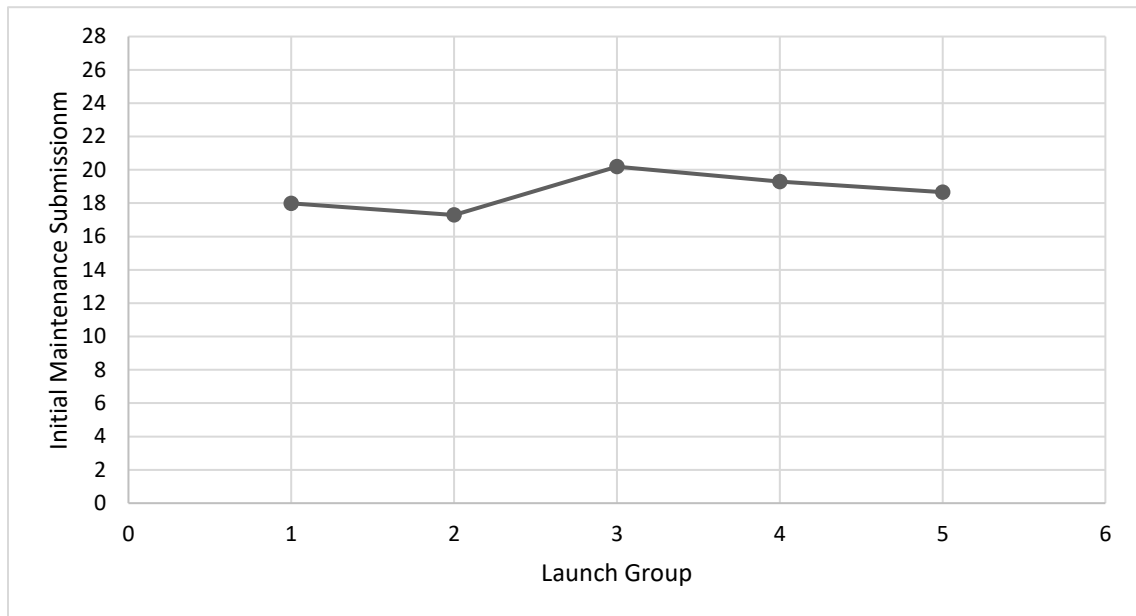


*Note.* KCAR-R Kentucky Coaching Adherence Rubric-Revised.

**Research Question Three**

I used a one-way ANOVA to address research question three exploring differences in provider's sustained caregiver coaching skills in their initial maintenance period based on engagement in optional, but recommended, preparatory activities (i.e., attending a maintenance refresher group meeting, viewing videos in exemplar library, both, and none). Descriptive statistics (Table 8) and histograms indicated normally distributed data and Levene's test confirmed the assumption of homogeneity of variance. Note, data analyzed here represents the 11-month time period for which both exemplar review and refresher meeting attendance information were available, January 2022 through November 2022. The results showed a statistically significant difference in

caregiver coaching skills $F(3, 93) = 3.139$, $p < .029$, with a medium effect

($\eta^2=.09$). Post hoc comparisons using Tukey's test detected differences between

the group that did not engage in any optional maintenance activities and the

group that engaged in both recommended activities of attending a maintenance

refresher group meeting and viewing exemplar videos prior to submitting their

initial video.

**Table 8**

*Descriptive Statistics for Provider Engagement in Optional Activities*

| Engagement in optional maintenance activities | *N* | % | *M* | *SD* |
|---|---|---|---|---|
| No meeting attendance or exemplars viewed | 36 | 37.1 | 18.97 | 3.45 |
| Only viewed exemplars | 11 | 11.3 | 19.73 | 2.83 |
| Only attended meeting | 38 | 39.2 | 20.45 | 3.42 |
| Attended meeting & viewed exemplars | 12 | 12.4 | 22.17 | 2.79 |
| Total | 97 | 100 | 20.03 | 3.41 |

Figure 10 shows increasing average KCAR-R scores on the initial maintenance

period video submissions for groups as they were more actively engaged in

optional maintenance preparatory activities.

**Figure 10**

*Initial Maintenance KCAR-R Averages for Optional Activity Engagement*
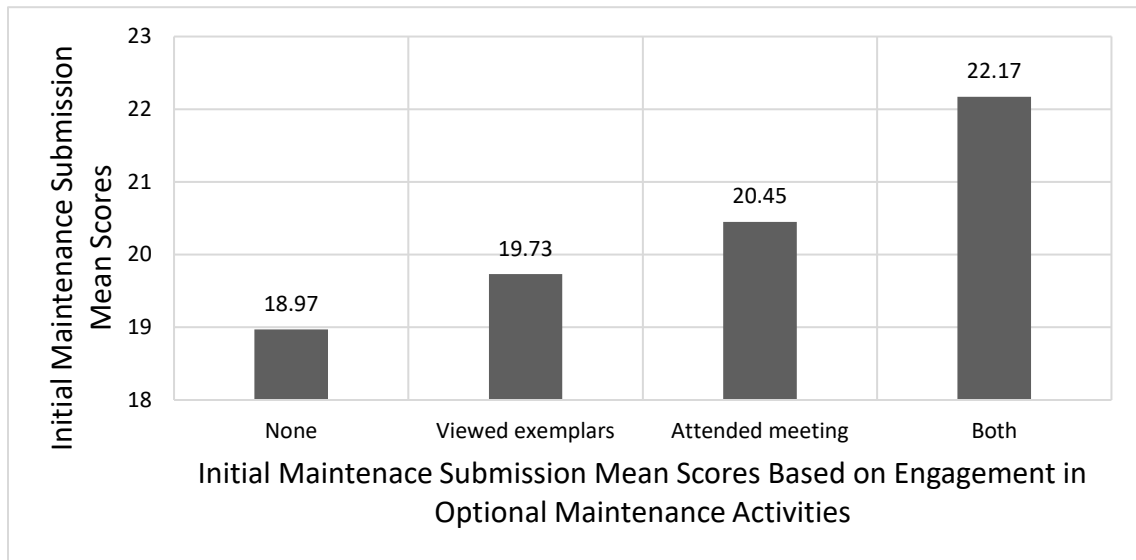


*Note.* KCAR-R Kentucky Coaching Adherence Rubric-Revised.

## Research Question Four

For research question four, I conducted a one-way ANOVA to examine differences in providers' sustained caregiver coaching skills on their initial maintenance video submission based on the length of time that occurred following their completion of the CEITMP (i.e., 2-4 months, 5-8 months, 9 months, 12, months). The length of time between CEITMP completion and initial maintenance period was determined based on KCAR-R scores obtained during the CEITMP fidelity phase. Descriptive statistics shown in Table 9 and histograms indicated normally distributed data and Levene's test confirmed the assumption of homogeneity of variance. Three high-performing participants' maintenance period length was established as 18-months, and due to the small size of this group, their data were excluded from these analyses. The ANOVA

showed a statistically significant difference $F(3, 158) = 10.363$, $p < .001$, with a large effect ($\eta^2=.16$). As shown in Table 10, post hoc analysis using Tukey's test revealed differences between means for the groups with the shortest amount of time (i.e., 2-4 months and 5-8 months) and the groups with the longer amounts of time (i.e., 9 and 12 months) from completion of the CEITMP to initial maintenance period. Figure 11 illustrates the trend of scores in the initial maintenance period by interval period of time. Participants who were higher performers in program and therefore had longer lengths of time between CEITMP completion and the initial maintenance period maintained higher scores on their first maintenance submission.

**Table 9**

*Descriptive Statistics for Initial Maintenance Period Length of Time*

| Length of time from CEITMP completion to initial maintenance video submission | *N* | % | *M* | *SD* |
|---|---|---|---|---|
| 2-4 months | 39 | 24 | 17.59 | 3.63 |
| 5-8 months | 65 | 39 | 18.22 | 3.40 |
| 9 months | 41 | 25 | 20.98 | 3.10 |
| 12 months | 17 | 10 | 20.94 | 2.63 |
| 18 months | 3 | 2 | 24.33 | 2.08 |
| Total | 165 | 100 | 20.03 | 3.64 |

*Note.* CEITMP = Coaching in Early Intervention Training and Mentorship Program.

**Table 10**

*Significant Differences Detected in Maintenance Period Length of Time*

| Difference in KCAR-R scores | Length of time (mos) | N | M | SD | Length of time (mos) | N | M | SD | Sig | d |
|---|---|---|---|---|---|---|---|---|---|---|
| Difference 1 | 2-4 | 39 | 17.59 | 3.63 | 9 | 41 | 20.98 | 3.10 | <.001 | 1.00 |
| Difference 2 | 2-4 | 39 | 17.59 | 3.63 | 12 | 17 | 20.94 | 2.63 | .004 | 1.06 |
| Difference 3 | 5-8 | 65 | 18.22 | 3.40 | 9 | 41 | 20.98 | 3.10 | <.001 | 0.84 |
| Difference 4 | 5-8 | 65 | 18.22 | 3.40 | 12 | 17 | 20.94 | 2.63 | .015 | 0.89 |

*Note.* KCAR-R Kentucky Coaching Adherence Rubric-Revised; mos = months.

**Figure 11**

*Initial Maintenance KCAR-R Averages Based on Length of Time*
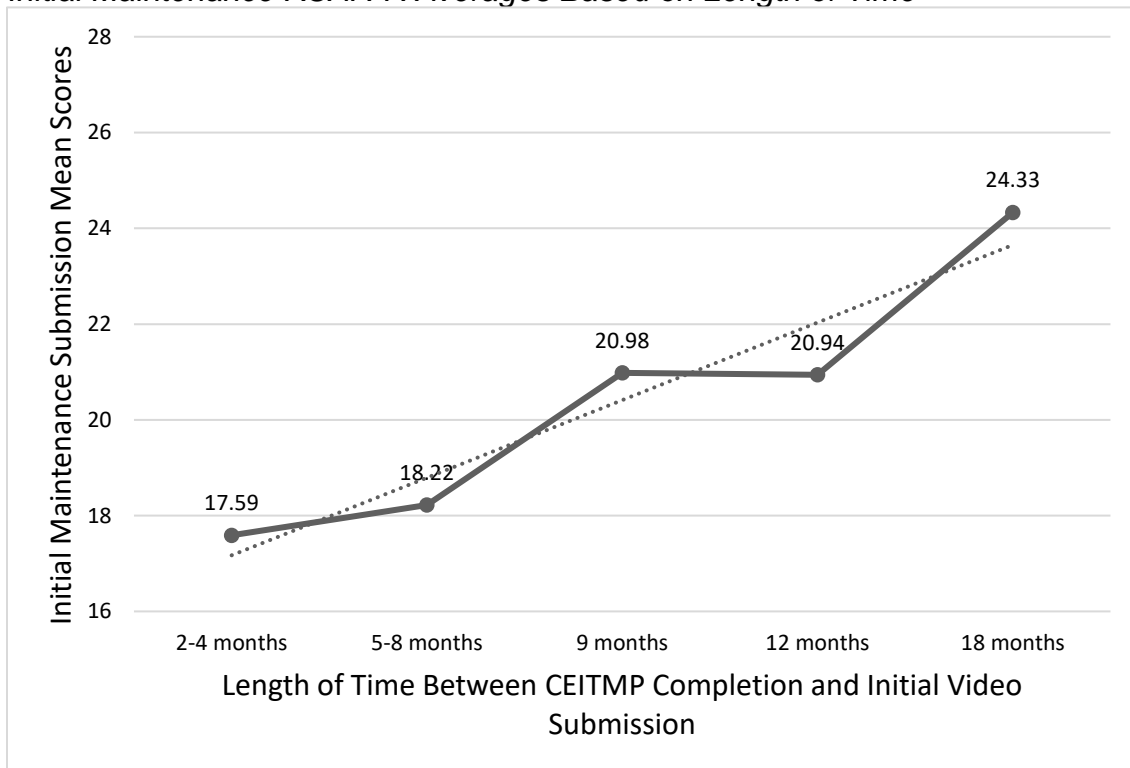


*Note.* KCAR-R Kentucky Coaching Adherence Rubric-Revised; CEITMP = Coaching in Early Intervention Training and Mentorship Program.

**Research Question Five**

Descriptive statistics were used to address research question five exploring the degree to which PDSs implemented the CEITMP components with fidelity. PDSs facilitated teams of EI providers during the CEITMP and recorded completion of required program activities in the team's end of cohort review file, beginning with cohort 11. Table 11 highlights PDS implementation fidelity by cohort and was calculated by dividing the number of complete EI providers' records on the cohort review file by the total number of records for respective cohorts. Overall, CETIMP PDSs demonstrated high fidelity of implementation (96.6%) for cohorts 11-16, ranging from 89.5% (cohort 12) to 100% (cohorts 11, 14, and 15).

**Table 11**

*PDS Implementation Fidelity of CEITMP Components*

| Cohort | N | Number of verified PDS implemented components | % Fidelity |
|--------|-----|-----|-------|
| 11 | 26 | 26 | 100 |
| 12 | 19 | 17 | 89.5 |
| 13 | 25 | 24 | 96.0 |
| 14 | 25 | 25 | 100 |
| 15 | 27 | 27 | 100 |
| 16 | 27 | 25 | 92.5 |
| Total | 149 | 144 | 96.6 |

*Note.* PDS = professional development specialist; CEITMP = Coaching in Early Intervention Training and Mentorship Program.

**Research Question Six**

For research question six, descriptive statistics were again used to explore the varying levels of assistance used by PDSs to support EI providers' successful completion of the CEITMP. Data was entered into the CEITMP master file sporadically for cohorts 1 through 8.5 and consistently beginning with cohort 9 to support CEITMP implementation during the pandemic. PDS support data was available on 87% of providers who completed the CEITMP in the first 17 cohorts. PDSs provided varying levels of individualized support to EI providers based on their needs as outlined in Table 12. The least amount of PDS support refers to providers who met or nearly met fidelity to caregiver coaching at baseline and developed individualized completion plans. The second level of support reflects providers who demonstrated awareness of caregiver coaching after discovery phase and a desire to finish the CEITMP at an accelerated pace. Providers completing the CEITMP according to the original schedule received the third level of PDS support. The fourth level of support represents flexibility afforded to EI providers such as schedules that allowed for delayed, early, or multiple submissions, and an additional 2-3 weeks to engage with caregiver coaching content. Finally, the fifth level refers to maximum PDS support, which involved individualized joint plans that included provisions for additional time, mentorship, and training for EI providers to better understand and apply caregiver coaching content to successfully complete the CEITMP. Half of all participants who completed cohorts 1-17 of the CEITMP were afforded flexibility and 36.2% completed according to the original schedule. A total of 13.5% of participants

received the greatest and least amount of PDS supports to successfully complete the CEITMP.

**Table 12**

*Percentage of EI Providers Who Received Each Level of PDS Support*

| PDS level of support | N | % |
| --- | --- | --- |
| Individualized CEITMP completion at baseline | 6 | 2.6 |
| Alternate accelerated CEITMP completion at mentorship phase | 3 | 1.3 |
| Supported according to original CEITMP schedule | 83 | 36.2 |
| Afforded flexibility | 115 | 50.2 |
| Individualized joint plan required due to extensive support needs | 22 | 9.6 |
| Total | 229 | 100 |

*Note.* EI = early intervention; PDS = professional development specialist; CEITMP = Coaching in Early Intervention Training and Mentorship Program.

CHAPTER 5 DISCUSSION

I conducted this retrospective study to investigate KEIS providers'

sustained intervention fidelity to caregiver coaching practices and PDSs'

implementation fidelity to a real-world, evidence-informed, multi-component,

high-intensity training and mentorship program designed to build caregiver

capacity to support their child's development and learning. In this chapter, I

discuss study results situated in the literature and explore the strengths and

limitations of the study. I conclude with recommendations for future research and

implications for practice.

**Study and Results Summary**

During SSIP planning, KEIS's leadership recognized the need to expand

the professional knowledge and skills of EI providers to deliver high-quality

services aligned with best practices that promote positive child and family

outcomes. A training and mentorship program was developed to focus on the

identified EBPs of strength-based, caregiver coaching; routines-based

interventions; caregiver-mediated/capacity-building practices; and natural

learning environment practices. My experience as one of the original PDSs

selected and trained to develop and implement the CEITMP for KEIS providers,

coupled with valuable existing CEITMP data led to this retrospective study.

I discovered opportunities to use implementation science theory and AIF to enhance the CEITMP implementation while I engaged with the literature and my mentors. Implementation science strives to narrow the knowledge to practice gap by focusing on system level components that support quality implementation, continuous improvement, and promote the adoption and integrated use of EBPs with fidelity to increase the likelihood of positive outcomes (Fixsen et. al., 2005; Franks & Schroeder, 2013), while AIF focus on the enabling contexts for both intervention and implementation fidelity to serve as a guide for systems' improvement by targeting sustainable EBPs (National Implementation Research Network, 2022a). KEIS's approach, SSIP goals, and CEITMP desired outcomes were a good fit for AIF as the SSIP highlighted the shift in focus from compliance to quality, while the CEITMP aimed to support active cross disciplinary providers to use and maintain caregiver coaching practices with fidelity to increase caregivers' self-perception of their ability to help their child develop and learn.

Experts agree that assessing fidelity of implementation practices by PDSs in conjunction with intervention fidelity is essential to understanding the extent intervention agents, such as EI providers, employ intervention practices with fidelity (Barton & Fettig, 2013; Dunst et al., 2013; Lemire et al., 2020; Neely, et al., 2017; Snyder et al., 2013) and results in a greater likelihood of intended outcomes (Barton & Fettig, 2013; Durlak & DuPre, 2008; Fixsen et al., 2005). Provider fidelity to caregiver coaching skills data was collected from the inception of the CEITMP. In response to the rapid shifts in EI that occurred during the

COVID 19 pandemic and ongoing improvement cycles, the CEITMP recognized the need and began recording PDS implementation fidelity.

Intervention and implementation fidelity are crucial to evaluating practice effectiveness and intended outcomes, and contribute to sustained practices (Dunst, 2015; Fixsen et al., 2005). There are few studies exploring aspects of implementation and intervention fidelity in EI settings along with enabling contexts to support the adoption and sustained use of EBPs linked to child and family outcomes (Ai et al., 2022; Barton & Fettig, 2013; Cook & Odom, 2013; Franks & Schroeder, 2013; Ledford & Wolery, 2013; Lemire et al., 2020; Lieberman-Betz, 2015; Neely et al., 2017; Ward et al., 2020). This investigation contributes to the literature base by examining a real-world, state-wide, PD program designed to support cross-disciplinary EI providers to use and maintain caregiver coaching practices with fidelity.

This retrospective study on data for 264 providers who completed the CEITMP, 157 of whom had an initial maintenance assessment point, showed substantial increases in caregiver coaching skills and high PDS implementation fidelity. The results of data analyses showed that the CEITMP was effective in impacting providers' growth in caregiver coaching skills and that providers maintained similar levels of fidelity to caregiver coaching skills in their initial maintenance period. There were some variations between groups at key PD assessment markers. Providers who engaged in optional maintenance activities demonstrated higher ratings on the KCAR-R than those who did not participate. PDSs implemented the CEITMP with good fidelity, provided individualized

supports, and afforded flexibility to support providers successful completion of the program.

**Implications**

To better understand the context of the existing data used in this study, situating the CEITMP implementation and sustainability plan is necessary. Key events of the CEITMP are described, including launches within the cohort roll-out, the resignation of one of the original PDSs, expanding the CEITMP team with two new PDSs, COVID-19 impacts, and adding a sixth PDS to support the team with maintenance growth. Table 13 summarizes timelines, events, and impacts to CEITMP implementation for launch groups, cohorts, and districts.

**Table 13**

*Timelines, Events, and Impacts to CEITMP Implementation*

| Launch Group | Launch Date | Cohorts | Districts | Events and impacts to CEITMP implementation |
|---|---|---|---|---|
| 1 | March 2018 | 1, 2, 3, 5 | Lincoln Trail | – CEITMP introduced to the state<br>– three PDSs supported CEITMP kick off implementation with first cohorts in first pilot site<br>– improvement cycles focused on program refinement and fidelity tool development using provider feedback<br>– growing angst about unpaid, required PD across the state<br>– KEIS leadership teams attempted to clarify misinformation |
| 2 | December 2018 | 4 | Big Sandy | – second pilot site, began CEITMP<br>– peak of provider and agency administrator protests about unpaid, required PD<br>– one PDS resignation required revision to roll-out plan and reduction in cohort enrollment numbers<br>– onboarded new PDS<br>– improvement cycles focused on program and fidelity tool refinement using provider feedback |

| 3 | January 2019 | 6, 7, 8, 8.5, 9, 10, 11, 12 | Bluegrass | – third and final pilot site began CEITMP<br>– mentorship and training for new PDS continued<br>– two additional PDSs were onboarded<br>– larger cohort sizes resumed<br>– COVID-19 pandemic impacted implementation and roll-out<br>– tele-intervention became primary mode of service delivery in the state<br>– several KEIS providers paused their contracts<br>– improvement cycles focused on new resource development to support caregiver coaching during tele-intervention service delivery and fidelity tool refinement<br>– PDS implementation fidelity process and checklist developed<br>– additional maintenance program supports were developed |
| 4 | February 2021 | 13, 14 | Barren River, Pennyrile | – first cohorts of statewide implementation to begin CEITMP<br>– in-person services gradually began to resume<br>– improvement cycles focused on program and fidelity tool refinement using provider feedback |
| 5 | July 2021 | 15, 16 | Green River, Gateway, FIVCO, KY River | – transitioned from three CEITMP cohorts simultaneously to two<br>– increased numbers of providers were being supported in maintenance<br>– one new PDS was onboarded to expand the CEITMP team to six PDSs<br>– improvement cycles focused on program and fidelity tool refinement using provider feedback |

*Note.* CEITMP = Coaching in Early Intervention Training and Mentorship Program; PDS = professional development specialist; PD = professional development; KEIS = Kentucky Early Intervention System.

To pilot and refine the mandated PD, the KEIS leadership group identified

Big Sandy, a small district serving eastern Kentucky including mountainous, rural

areas; Lincoln Train, a medium size district outside the Louisville metropolitan region including rural areas and a military base; and Bluegrass, a large district serving central Kentucky, including urban and rural areas (Goff, 2015). Prior to implementation, the SLA distributed the roll-out plan for the first three districts which reflected a gradual increase in cohort enrollment size to allow for improvement cycles to inform CEITMP and KCAR-R refinements. Lincoln Trail district was selected as the first launch group to begin the CEITMP, with three PDSs implementing. Though all in the district would be required to participate, nine providers volunteered for the first cohort. Implementation of the CEITMP with launch group 1 provided an opportunity for clarifications, improvements, needs' assessments, and changes to the curriculum, approach, and supports. From the beginning, the CEITMP team surveyed providers, added video examples to an exemplar library, gathered PDSs' reflections, and collaborated with the district's POE manager and SLA to make program revisions. The CEITMP used the feedback and adult learning principles to transition many early activities from primarily self-directed to more interactive and team-focused. Providers and agency administrators across the state were increasingly vocal in expressing their opposition to the unpaid, required PD; therefore, podcasts and announcements on the state's electronic records platform were used to attempt to clarify misinformation.

At the end of the first year of PD implementation and a peak in providers' and agency administrators' dissatisfaction with the CEITMP requirement, the second group (i.e., cohort 4, Big Sandy), which contained one cohort, was

launched. Soon after, a PDS resigned and significantly impacted program implementation and roll-out plan. The remaining CEITMP team members continued to support providers across three existing cohorts, refine the program and fidelity measure, launch the third group in the Bluegrass pilot site, and revise the roll-out plan to reduce the number of providers to enroll in cohorts while a new PDS was hired and trained.

In fall/winter 2019/2020, two additional PDSs were onboarded, the CEITMP team was at full capacity for the first time since cohort 3, and two large cohorts (i.e., 8 and 9) were enrolled. In the spring of 2020, the COVID-19 pandemic greatly impacted CEITMP implementation for existing cohorts (i.e., 7, 8, 9). The SLA paused KEIS services briefly to develop policies, procedures, and emergency regulations for alternate service delivery methods, while providers contemplated learning to provide EI services via tele-intervention (TI), waiting for in-person services to resume, or terminating their KEIS contracts. The CEITMP team pivoted to concentrate efforts on developing provider supports (i.e., video podcasts, TI video exemplars, infographics, technical support), making further refinements to the fidelity tool and curriculum based on feedback, revising the roll-out plan, collaborating with the SLA on forums for providers and caregivers related to the transition to TI, and developing a mechanism to assess PDS implementation fidelity. Providers enrolled in the CEITMP were given the option to continue the PD or defer participation. Three enrolled providers out of 50 transitioned to TI and chose to complete the CEITMP. During this time, the CEITMP team also began to develop additional resources targeting support for

providers to sustain caregiver coaching practices with fidelity in maintenance. The maintenance communication plan was refined and included a trigger notification of maintenance periods from the SLA, and an optional, 90-minute refresher group meeting was developed and offered monthly. The pandemic lingered and many providers recommended providing services; thus, the SLA required active providers from the previously launched groups to resume participation and enrollment in the CEITMP.

In fall 2021, the CEITMP team continued to make improvements in cycles (i.e., cohorts, launch groups, maintenance) while implementing the program with three large, staggered cohorts concurrently. In preparation for growing maintenance activities, the cohort roll-out plan was revised so that two cohorts, rather than three, would occur simultaneously. A new PDS was onboarded to offset the increasing workflows associated with supporting providers in maintenance. Additionally, the CEITMP team and SLA collaborated to develop a high-quality video featuring a caregiver and child along with their EI service coordinator and provider, emphasizing the connectedness of the family assessment, IFSP, and ongoing services and the resulting caregiver capacity increase. A companion infographic was also developed. The video was placed on the CEITMP KEIS YouTube page and shown to new families as they began receiving KEIS supports.

Sustained fidelity to caregiver coaching practices to support caregivers to help their children develop and learn is the primary focus of the CEITMP. After demonstrating fidelity to caregiver coaching practices, providers are prepared for

maintaining sustained fidelity in the final phase of the CEITMP. Although

optional, recommended activities and resources are available to support

providers in maintenance. For example, CEITMP communications reminds them

to revisit their PD plans, provides a list of coaching resources, promotes

accessing the exemplar library, and facilitates monthly refresher group meetings.

After demonstrating sustained fidelity to caregiver coaching, providers enter the

next maintenance period.

### *Significant Change and Sustained Practices*

Current study findings noted significant growth in providers' caregiver

coaching skills from baseline to immediately following high-intensity training and

mentorship and continued small growth post high-intensity training and

mentorship to initial maintenance period. I anticipated this result, as the CEITMP

was developed using adult learning principles essential to high-quality PD (Dunst

et al., 2015; Rieth et al., 2022; Spence & Santos, 2019; Childress et al., 2021)

offering needed training and mentorship (Vismara et al., 2013), while also aligned

with providers' existing practices (Rieth et al., 2022). Consistent with Meadan et

al. (2020), growth was noted in providers' knowledge and ability to use an

intervention with fidelity after high-quality PD. I hypothesized there would be

slippage in providers' caregiver coaching skills in maintenance; surprisingly, as a

group, there was continued growth at the initial maintenance period assessment

marker, which varied from 2-18 months following CEITMP completion. AIF

(National Implementation Research Network, 2022a), as well as several factors

noted in previous studies (Ai et al., 2022; Rieth et al., 2022; Vismara et al., 2013)

were similarly identified as impactful to sustained fidelity observed in this study. The usable innovation of caregiver coaching, a capacity-building approach to support caregivers to support KEIS eligible families to help their child develop and learn, was embraced by the state leadership. The implementation teams drove the implementation stages to assess needs, install the CEITMP and fidelity tool, pilot the PD in varying sized and geographic located districts, utilize improvement cycles to refine the program, and transition to full implementation.

To support CEITMP development, strong KEIS leadership secured organizational support, consistent funding, and data-based decision-making processes. The PD was based on the evidence and designed to be systematic, comprehensive, and capacity-building; it included user-friendly training materials in multiple formats; ongoing technical support; opportunities for EI providers to receive performance feedback and individualized coaching from a skilled mentor; use of a group training model; and was facilitated by a collaborative team. High-quality PD using AIF supports change in practitioner performance with sustained application of evidence-based strategies with fidelity (Metz et al., 2013; National Implementation Research Network, 2022a). Scholars (Barton & Fettig, 2013; Cook & Odom, 2013; Dunst et al., 2013; Fixsen et al., 2005) indicate positive outcomes are more probable when practices are based on or informed by current evidence and employed with fidelity. Kentucky Federal Fiscal Year (FFY) 2021 SPP/APR (Kentucky Cabinet for Health and Family Services, 2022) data showed higher average scores on the Family Outcomes Survey – Revised (FOS-R; Early Childhood Outcomes Center, 2010) sections relevant to caregiver coaching for

Kentucky districts in which the CEITMP had been implemented; as well as high

averages of understanding your child's strengths, needs, and abilities, and

helping your child develop and learn outcomes statewide. Child outcome data

obtained from the state's electronic database (i.e., Kentucky Early Childhood

Data System (KEDS) of formal developmental assessments with at least two

data points reflected a 95.4% increase in children's positive social emotional

skills, a 96.3% increase in children's use of appropriate behaviors to their needs,

and a 95.5% increase in children's acquisition and use of knowledge and skills.

Though unable to align with specific families who were supported by providers

who completed the CEITMP, Kentucky SPP/APR shows aggregate data on child

and family outcomes is trending positively.

### Differences by Group Characteristics

I also examined differences in caregiver coaching skills across the three

assessment makers for discipline, years' EI experience, cohort, and launch group

variables. Campbell and Sawyer's (2009) study on participation-based practiced

reported no significant differences based on provider discipline or years of

experience. I anticipated comparable findings. No differences in caregiver

coaching skills were found in this study based on provider years of experience

across assessment markers. The cross-disciplinary providers investigated in this

study demonstrated similar abilities to coach caregivers with fidelity. Although no

differences were identified between disciplines at baseline or immediately

following high-intensity training and mentorship, one group difference was

identified at the initial maintenance period marker; SLPs demonstrated higher

averages than DIs. SLPs' likely motivated to secure CEUs, earned by engaging in optional maintenance activities, were shown to have higher scores than those who did not engage. I hypothesize this subset of providers influenced the differences between these two disciplines.

Notable differences in caregiver coaching skills were identified at key PD assessment markers for specific cohorts and launch groups. When the CEITMP was deployed, caregiver coaching practices were new to most KEIS providers and no statewide caregiver coaching resources existed. To continuously refine and improve the PD for providers, the CEITMP team developed caregiver coaching resources, clarified language on the KCAR-R, ensured consistent messaging, developed a frequently asked questions document, and PDSs gained valuable mentoring experience. As the PD rolled out across the state, providers who had completed the PD, shared the newly developed caregiver coaching resources and the fidelity tool with other providers before they enrolled in the CEITMP. Providers were learning more about caregiver coaching from other providers when collaborating on IFSP teams, likely adding to their base knowledge prior to recording their baseline video. The final cohorts in launch group 3 (i.e., Bluegrass district) signaled the end of the pilot, and at this time in the pandemic, TI was the primary mode of service delivery. Many CEITMP participants stated that coaching caregivers was much easier using TI than in person services because it required caregivers to be the intervention agents. Together, these factors contributed to the differences in baseline performance between the earliest cohorts in the Lincoln Trail district with the lowest KCAR-R

average scores, and the later cohorts in the Bluegrass district, with the highest average scores.

Another variation in caregiver coaching skills between specific cohorts and launch groups occurred at the post high-intensity training and mentorship assessment marker. Like the baseline marker, the early cohorts in launch group 1 scored significantly lower immediately following high-intensity training and mentorship than cohorts in launch groups 3, 4, and 5, and cohort 15 scored higher than cohort 4 The processes refined during improvement cycles (National Implementation Research Network, 2022a), such as training POE districts on efforts to support the CEITMP (i.e., ensure family assessment completion, functional outcomes, introduction to caregiver coaching) before the PD was launched for a group, PDSs' refined and enhanced group meeting approaches, the transition to feedback exclusively from PDSs rather than peers with more time dedicated to reflecting on their own practices, clarifications to the rubric, and expanded resources (i.e., infographics, podcasts, exemplars), supported higher average scores for launch groups 3, 4, and 5. Additionally, the more fragmented support provided during the replacement of a PDS and lack of flexibility for enrollment may have influenced the lower scores from cohort 4.

Steady increases in caregiver coaching scores measured by the KCAR-R were observed across launch groups except for the second. The Big Sandy district (i.e., launch group 2) consisted of one cohort and occurred at the peak of statewide angst about the CEITMP; EI providers in this district had only one choice of cohort with no flexibility to select a preferred time to begin the CEITMP;

and they endured one of the most challenging transitions for the CEITMP team (i.e., PDS resignation and replacement onboarding during early program refinement). Taken together, these factors likely contributed to the lower average caregiver coaching skills immediately following high-intensity training and mentorship. Ai et al. (2022) and Rieth et al., (2022) noted that lack of system cohesiveness and varying levels of access to high-quality materials and supports impacted sustained fidelity. The early program development and refinement activities while launch group 1 was enrolled in the CEITMP, and the fragmented support provided to launch groups 1 and 2 were less cohesive than subsequent launch groups. Launch group 3 had the benefit of a longer amount of time to prepare and flexibility for enrollment in the CEITMP. Additionally, providers in later launched groups were supported by PDSs with more experience and additional high-quality resources. These factors likely account for the lower average scores earned by launch groups 1 and 2 compared to the higher average scores demonstrated by launch group 3 on initial maintenance video submissions to demonstrate sustained fidelity to caregiver coaching.

**Optional Activities for Sustained Fidelity**

KEIS vendor agreements indicated providers must complete all required CEITMP activities (i.e., group meetings, reflection on a video recorded EI session, submit self-assessed clips and videos for performance feedback, PD plan, exit survey), including demonstrating fidelity to caregiver coaching to maintain their vendor agreement. State licensure board CEUs were awarded to OTs (35 hours), PTs (28 hours), and SLPs (15 hours) for successful completion

of the program. DIs' governing organization (i.e., Kentucky Department of Education) does not require annual CEUs to maintain certification. Requirements for maintenance period completion were significantly less and included periodically submitting video evidence of sustained fidelity to caregiver coaching, with a completed self-assessment and appropriate consent. All providers were encouraged to engage in optional maintenance activities to support achieving fidelity on their initial maintenance period submissions. Although numerous activities were available (i.e., PD plan, coaching review resources, book chapters, etc.), the CEITMP highly recommended providers attend a 90-minute refresher group meeting and view exemplar videos prior to submitting their video for review. These two strategies were most frequently cited by providers as effective in supporting their caregiver coaching skills. Additionally, OT, PT, and SLP providers who attended the refresher group meeting, completed a detailed self-assessment, submitted their video by the due date, demonstrated fidelity to caregiver coaching, and submitted an updated PD Plan, earned four pre-approved discipline specific CEUs for their maintenance period. Adult learning methods with job-embedded opportunities for providers to practice and reflect, mentoring and performance feedback from experts, and ongoing follow-up supports after adequate time to learn the practice promote positive outcomes for providers and the children and families they serve (Dunst et al., 2015). Data analyses revealed that providers who actively engaged in the optional, recommended activities of attending a refresher group meeting and viewing exemplars had the highest scores on their initial maintenance submissions.

These scores were statistically significantly higher than those of providers who did not engage in activities. Since this large group of providers who did not engage in these optional activities had the lowest averages, the CEITMP should focus future efforts on increasing provider engagement with the recommended maintenance activities.

***Length of Time Between PD and First Maintenance Period***

Sustained fidelity to EI practices has been reported on a limited scale and a short amount of time between PD completion and maintenance has been reported including four weeks (Krick Oborn & Johnson; 2015) and two to three weeks (Coogle et al., 2019). The length of time between CEITMP completion and initial maintenance period ranged from 2-18 months and was determined by providers' two highest fidelity phase video scores, with a greater span of time rewarding higher scores. As expected, data indicated that level of performance in the CEITMP was consistent with initial maintenance period performance. That is, providers who had sooner maintenance periods due to lower in program video scores, continued to earn lower scores on their initial maintenance video, and providers who had a longer distance to their initial maintenance period because of higher ratings in program, scored higher on their initial maintenance submission. This data affirmed the program's approach to a variable schedule of maintenance to support providers determined by in program performance.

***PDS CEITMP Implementation Fidelity***

Comprehensive PD with data-driven processes (Ai et al., 2022; Barton & Fettig, 2013), and organized, user-friendly materials (Rieth et al., 2022) are

features associated with implementation fidelity. Implementation checklists are the most frequently used methods for measuring implementation (Lemire, 2020) and are reported less often than intervention fidelity and outcomes (Barton & Fettig, 2013; Lemire et al., 2020; Neely et al., 2017; Ward et al., 2020). Implementation fidelity procedures embedded into existing workflow for the CEITMP team were developed in response to the rapid changes during the pandemic and formally documented beginning with cohort 11. The data showed that PDSs' fidelity to implementing the CEITMP was good across the six cohorts and above the minimal level for each cohort. Implementation of PD with fidelity contributes to the integrity of the program to support intervention fidelity designed to promote positive outcomes (Barton & Fettig, 2013; Dunst et al., 2013; Lemire et al., 2020; Neely et al., 2017; Snyder et al., 2013).

### PDS Support of Providers

The CEITMP team has intentionally been responsive to EI provider needs to develop their knowledge and skills by providing varying levels of assistance to support their successful completion of the program. PDSs used this flexibility to support EI providers and foster trusting mentor-mentee relationships. Vismara et al., (2013) highlighted considering participants' needs as important in supporting them to demonstrate fidelity. Providers who entered the program with base knowledge, experience with caregiver caching, or intrinsic motivation to develop their skills required less PDS assistance than those who did not value or were less motivated to engage with the content and practice, had life events impact their participation, or needed additional support to grasp and apply caregiver

coaching practices. PDSs' individualized supports of providers to successfully

complete the CEITMP was recorded sporadically until a system of documentation

was established for cohort 9 and beyond. The results show that half of all

providers were afforded flexibility due to varying circumstances (i.e., competing

time demands, limited opportunities to record, vacation, illness, visit cancelations,

etc.) and approximately one-third completed the CEITMP according to the

original schedule. The CEITMP should continue to provide support to match

providers' needs to ensure they complete the program successfully with

increased knowledge and skills around caregiver coaching.

**Strengths and Limitations**

Experts agree that assessing both the fidelity of intervention practices and

implementation methods (i.e., PD), improves the rigor of study designs and is

essential to promoting desired outcomes (Barton & Fettig, 2013; Dunst et al.,

2013; Lemire et al., 2020; Neely, et al., 2017; Snyder et al., 2013). Few studies

have explored real-world EI PD programs for effective implementation,

intervention, enabling contexts, sustained use of recommended practices, and

associated outcomes (Barton & Fettig, 2013; Cook & Odom, 2013; Ledford &

Wolery, 2013; Lemire et al., 2020; Lieberman-Betz, 2015; Neely et al., 2017;

Ward et al., 2020). This retrospective study capitalizes on extant data collected

from a real-world PD program to investigate both KEIS providers' fidelity to a

defined set of caregiver coaching skills across three key assessment markers,

and PDS's fidelity to implementing the CEITMP. Summative administrative data

from the annual KEIS SPP/APR on family and child outcomes contextualizes study findings.

Additional strengths of this study include the high number of providers, representative sample, and the real-world context of the PD. Data collected on 264 contracted KEIS providers from 17 CEITMP cohort are substantial in number compared to previous studies (Childress et al., 2021; Coogle et al., 2019; Meadan et al., 2020; Romano et al., 2021; Spence & Santos, 2019) and builds on EI provider caregiver coaching practices investigated in the research contexts (Ciupe & Salisbury, 2020; Salisbury & Copeland, 2013; Salisbury et al., 2018). All active, cross-disciplinary KEIS providers (e.g., DIs, OTs, PTs, SLPs) are expected to complete the CEITMP as a component of their service provider agreement; therefore, the convenience sample for this investigation is representative of the state provider pool and did not rely on volunteers or recruitment of participants by desired characteristics, such as longevity in discipline, position, education, or experience (Coogle et al., 2019; Rieth et al., 2022; Spence & Santos, 2019; Vismara et al., 2013). To be effective, PD programs should reflect sufficient intensity, duration, and follow-up for providers to learn and refine a practice (Dunst et al., 2015). Some research projects with volunteer EI provider participants have been of short intensity and duration (Childress et al., 2021; Coogle et al., 2019; Romano et al., 2021; Spence & Santos, 2019). However, the CEITMP spanned seven months, had an estimated weekly time expenditure of up to 90 minutes, and included a maintenance component that targeted sustainability (Coaching in Early Intervention Training

and Mentorship Program, 2022a), reflecting the high-quality support recommended to learn and refine a practice (Dunst et al., 2015).

Ex post facto research designs are the best match for studying outcomes and effects after they have occurred and absent of researcher manipulation of variables, conditions, or randomization (Ary et al., 2010); however, there are limitations to this approach. Retrospective studies are susceptible to threats to internal validity and limit the extent to which inferences can be made about changes in the dependent variable by the independent variable and no other factors (Ary et al., 2010; Pituch & Stevens, 2015). There was no control group for comparison or manipulation of variables; therefore, results of this study should be interpreted with caution. To address this threat, a repeated measures statistical analysis was used so that participants served as their own control, lessening the impact of selection bias, and strengthening the statistical power of the analysis.

Instrumentation is also a possible threat to internal validity, as the language in the fidelity instrument, the KCAR-R, was being refined simultaneous to its use. The KCAR-R was developed and used to measure a set of defined caregiver coaching skills beginning with the first PD cohort in 2018. As part of regular improvement cycles, the language on the KCAR-R was clarified based on provider feedback in March 2021, and further refined in March 2022. To mitigate the instrumentation threat, an iterative training on the KCAR-R and reliability process spanning six months occurred as each CEITMP team rater was onboarded. Additionally, reliability was routinely established on at least 20% of all phase videos, and the full CEITMP team reviewed the same video and engaged

in in-depth discussion of each CQ to calibrate quarterly. Lastly, this study is restricted to active DI, OT, PT, and SLP KEIS providers enrolled in 17 cohorts between April 2018 and November 2022, serving children and families in districts where the CEITMP was deployed.

**Recommendations for Future Research and Practice**

This study examined the first maintenance video submission following completion of a high-intensity training and mentorship program. Future research should examine variables associated with longer term sustainability of caregiver coaching practices across multiple maintenance period assessment points. Additionally, since the CEITMP is a state-supported, evidence-informed PD specifically designed to support KEIS providers to build caregiver capacity around their priorities, a future prospective study should investigate: (1) the effect of intervention fidelity of EI providers' use of caregiver coaching skills, (2) PDSs' implementation fidelity, (3) improvements in caregiver-identified family and child outcomes, and (4) families' perceptions of caregiver coaching. Lastly, future research should investigate CEITMP components most effective in supporting sustained provider practice change.

Given the findings of this study framed by implementation science theory, continued use of AIF should continue to be used to support CEITMP deployment and ensure high-quality opportunities for EI providers to enhance their knowledge and skills to use caregiver coaching with fidelity. Specifically, refinements informed by previous improvement cycles should be used to launch the final group in the state. Aspects of the CEITMP that have contributed to its success,

such as assuring intervention and implementation fidelity data; using multiple sources of feedback to inform process improvements; and providing flexible, multi-modal, individualized supports, should be continued. Knowing that providers who engaged in recommended activities maintained fidelity with higher KCAR-R scores than those who did not engage, CEITMP team efforts should explore strategies to increase provider engagement with activities to support sustained intervention fidelity in maintenance.

Finally, disseminating and sharing results of the study can support the endeavors of other workgroups, programs, and systems. For example, KEIS leadership has convened a workgroup to develop a tiered-rate reimbursement system to compensate providers based on their level of service quality. Since sustained fidelity of EBPs increases the likelihood of intended outcomes, data collected on providers' sustained fidelity to caregiver coaching practices can be shared with the workgroup, as a potential indicator of quality EI services. Lastly, RDA, the accountability system from OSEP, has required state Part C systems to expand their focus from solely on compliance to include both compliance and results. Therefore, sharing the successful strategies identified and results of this study with other programs, could support their efforts to commit to large-scale change in their systems targeting high-quality service provision.

**Conclusion**

This study investigated high-quality PD using AIF and results indicated change in EI providers' performance with the ability to maintain skills with fidelity, and aggregate state data showed positive child and family outcomes. The

CEITMP, an evidence-informed PD, focused on training and mentoring EI

providers to employ and maintain use of caregiver coaching practices with fidelity

to support caregivers help their children develop and learn. PDSs' level of

CEITMP implementation fidelity was good and essential to supporting providers'

successful completion of the CEITMP.  Most importantly, recent annual state

data showed increases in caregivers' ability to understand their child's strengths,

needs, and abilities; and to help their child develop and learn. Child outcome

data showed improvements in children's social-emotional skills, use of new

knowledge and skills, and use of appropriate behavior to meet their needs.

These results emphasize the significance of maintaining CEITMP implementation

fidelity focused on training and mentoring EI providers to coach caregivers with

sustained fidelity, to continue to promote positive child and family outcomes.

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# APPENDIX A

## Adult Learning Key Features: Coaching in Early Intervention Training and Mentorship Program

| PD Key Feature | Reflective Mentorship and Training Activities |
|---|---|
| **Introduce and illustrate coaching** | • Syllabus introduces Kentucky's adoption of a coaching interaction style and outlines program objectives, activities, resources, and measure<br>• Asynchronous exemplar video demonstrations of coaching<br>• Dunn & Pope Coaching eLearning lessons<br>• Rush & Shelden, (2020) Early Childhood Coaching Handbook<br>• PDS introduce, discuss, and model coaching practices during group meetings |
| **Job-embedded practice** | • EI providers transition to/strengthen embedding coaching practices into sessions. |
| **Provider Self-Reflection** | • EI providers self-select coaching components to practice during the discovery phase and reflect on progress<br>• EI providers video record their sessions and self-assess their coaching practices using time-synced written reflection<br>• EI providers self-reflect on coaching practices via anonymous survey questions responses, eLearning lesson, and journaling activity |
| **Collaborative Teaming** | • Cohorts of 30 EI providers are assigned a dedicated PDS mentor in teams of 3-6<br>• PDS facilitates 90-min monthly virtual small group discussion and reflection |
| **Performance Feedback from PDS** | • Mentoring & Non-mentoring PDSs offer time-synced written performance feedback on recordings of their EI visits via TORSH<br>• Mentoring PDS offers individualized support and feedback throughout CEITMP |
| **Duration, Intensity & Maintenance** | • CEITMP spans 32 weeks with a planned time expenditure of 30-90 min/week<br>• Providers offered flexibility in cohort enrollment and opportunities for individualizing learning and mentorship, including extensions and early completion<br>• Mentoring PDS supports development of PD plan for sustaining coaching practices after CEITMP completion<br>• Following program completion, PDS facilitates monthly group discussions for past participants to review content and promote reflection on coaching practices prior to sending video of EI session for review/feedback<br>• Periodic maintenance video submissions by providers receive performance feedback from PDS to ensure sustained coaching practices |

# APPENDIX B

# Coaching in Early Intervention Training and Mentorship Program

| Program Overview | | |
|---|---|---|
| **Phase** | **Training and Mentorship Activities** | **Outcomes ~ Providers** |
| **Pre-CEITMP & Kick-off** | ❖ Submit Kick-off prompt question during initial survey<br>❖ Submit baseline video of full early intervention visit before Kick-off<br>❖ Actively participate in Kick-off meeting | *will express understanding of the CEITMP purpose, expectations, activities, timeframes & platforms that will be used and know where to find additional supports*<br><br>❖ must complete all activities listed in red on *Quick View* |
| **Discovery Phase: 12 weeks** | ❖ Read content in *The Early Childhood Coaching Handbook*<br>❖ View eLearning modules<br>❖ Actively participate in 3 group meetings<br>❖ Complete 5 coaching characteristics video activity via TORSH | *build foundational knowledge of caregiver coaching*<br><br>❖ must complete all activities listed in red on *Quick View*<br>❖ will demonstrate an evolving understanding of the concepts of caregiver coaching in early intervention |
| **Mentorship Phase: 10 weeks** | ❖ Complete Technology Training<br>❖ Review exemplar clips of early intervention caregiver coaching<br>❖ Submit combo video clips with self-assessments as evidence of the 7 CQs from at least two different videos<br>❖ Reflect on feedback from coach<br>❖ Actively participate in 3 group meetings | *begin to apply knowledge of caregiver coaching*<br><br>❖ must complete all activities listed in red on *Quick View*<br>❖ will apply understanding of the 7 Coaching Quality Indicators on the *Kentucky Coaching Adherence Rubric* |
| **Fidelity Phase: 6 weeks** | ❖ Submit 3 video recordings of entire visits with self-assessments<br>❖ Reflect on coach feedback<br>❖ Actively participate in 1 group meeting | *refine skills to implement caregiver coaching with fidelity*<br><br>❖ must complete all activities listed in red on *Quick View*<br>❖ will demonstrate implementation of caregiver coaching practices with fidelity according to the *Kentucky Coaching Adherence Rubric* |
| **Professional Development Phase: 3 weeks** | ❖ Submit a professional development plan designed to support continued fidelity to caregiver coaching and strengthening web of support<br>❖ Actively participate in 1 group meeting<br>❖ Complete anonymous Exit Survey | *plan for maintaining fidelity to caregiver coaching and building a web of support*<br><br>❖ must complete all activities in red on the *Quick View*<br>❖ will develop a plan for sustaining caregiver coaching practices with fidelity |
| **Maintenance Periodic** | ❖ Periodic fidelity checks of caregiver coaching practices via recorded early intervention visits; frequency determined by level of application of coaching<br>❖ Opportunities to mentor, support or connect with colleagues around caregiver coaching in early intervention | *must maintain fidelity to caregiver coaching*<br><br>❖ will continue to implement caregiver coaching with fidelity according to the *Kentucky Coaching Adherence Rubric*<br>❖ will connect with EI community |

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# APPENDIX C

## Kentucky Coaching Adherence Rubric-Revised

| CQ | PROVIDER... | Not Yet 0 | Knowledge 1 | Awareness 2 | Application 3 | Mastery 4 |
|---|---|---|---|---|---|---|
| CQ1 FTR | Fosters trusting relationships when partnering with caregivers by connecting, listening, and responding in respectful, supportive ways | Focuses attention mostly on child | Directs; talks more than listens; conversation may be general or not related to caregiver topic(s) | Leads conversation; responds to caregiver statements mostly to clarify or review | Interacts reciprocally; actively listens; shows interest and sensitivity for family members | Stays engaged with caregiver to consistently shape conversation around caregiver topic(s); communicates in respectful, strengths-based ways; includes family members |
| CQ2 JPB | Engages caregiver early in session to review previous joint plans and develop priorities for current visit | No joint plan; takes charge of visit, directs activities | Confirms only previous or current plan; May offer own activity suggestion(s) for current visit and ask caregiver for input | Reviews only priority of previous and current plan; or use of questions leads to development of only one plan part to include both caregiver priority with additional detail(s) (e.g., with who, family routines, activity, strategy) | Supports caregiver to review how previous joint plan went and to ultimately identify their priority for current visit; discussion allows caregiver to identify at least one detail (how, what, why, where) for both plan parts. Joint plan implemented. | Launches visit by engaging with caregiver to reflect on previous joint plan implementation and develop explicit, detailed plan for current visit (activities around their priority, preferred contexts, methods, and purpose). Joint plan for current session implemented. |
| CQ3 O | Observes caregiver and child in prioritized activities followed by asking reflective questions to promote insight and/or flow to action/practice | Does not or has no opportunity to observe child activities or child-caregiver interactions | Selects activities to observe or observes activity not related to stated family priority or joint plan; asks informational questions, if any | Observes child activities and/or child-caregiver interactions related to stated family priority or joint plan; may ask questions to gain information and/or give feedback | Captures opportunities to intentionally observe child-caregiver interaction in identified family prioritized activities followed by asking at least one reflective question related to the observation to promote caregiver insight | Collaborates with caregiver to observe child-caregiver interaction in prioritized family routines/activities, followed by using reflective questions to elicit caregiver insight or/and flow into action/practice |
| CQ4 A/P | Proactively captures opportunities for caregiver to practice their prioritized ideas and reflect | Utilizes own materials/props to engage child in activity or alter activity; or no opportunity to observe child or child-caregiver action/practice | Implements own activities; attempts to engage caregiver in the activities | Identifies opportunities and supports caregiver to practice ideas/strategies linked to stated priorities; may offer feedback | Cues, prompts and/or models to engage caregiver to practice or try ideas related to their identified priority; At least one reflective question follows to facilitate caregiver insights related to the action/practice | Uses intentional modeling, cuing, or prompting to engage caregiver to practice or try ideas related to their priority in a natural routine; use of reflective questions with caregiver encourages linkage to other routines, contexts, or outcomes |
| CQ5 F | Provides substantive feedback to caregiver, to affirm and attempt to enhance their learning experience and insights | No feedback provided to caregiver; child focused | Directs praise toward caregiver and/or offers suggestions | Praises caregiver and provides explanation of why; may offer suggestions/ information prior to giving caregiver opportunity to reflect | Acknowledges or confirms shared understanding paired with substantive explanations; if offered, suggestions or information are related to activity/priority and after ample time for caregiver reflection | Reflects with caregiver about experience to affirm and attempt to enhance caregiver insight, learning or action |
| CQ6 R | Asks effective reflective questions to stimulate thinking, promote problem solving, and elicit insights from the caregiver | Makes many declarative statements; may ask yes/ no and informational questions, without intent to reflect | Asks at least one question with reflective intent; directs conversation more than responding | Occasionally asks questions with reflective intent; may lead part of conversation to a particular response | Frequently employs open-ended reflective questions with intent to have caregiver share thoughts and insights related to their priority or the joint plan | Predominantly and throughout the session, asks open-ended reflective questions related to caregiver priority or the joint plan and allows opportunity for them to respond with thoughts and insights |
| CQ7 JPE | Engages caregiver in developing detailed plans for actions between visits and for the next visit centered on their priorities | No joint plan formed | Confirms only between or next visit plan; May direct plan development by giving homework or selecting the best activities to work on | Reviews only priority for between visit and next visit plans OR use of questions leads to one plan part to include both caregiver priority and at least one additional detail (e.g., with who, family routines, activity, strategy); assumes strategies/ activities based on visit or discussion | Supports caregiver to ultimately identify what they would like to focus on between visits and for the next visit; discussion allows caregiver to define at least one additional detail for both plan parts | Ends visit by engaging with caregiver to reflect and develop more detailed plans for between visits and the next visit that includes caregiver's priority, preferred contexts, methods, and purpose. |

# APPENDIX D

## Variable List

| | |
|---|---|
| **ID** | Unique assigned number |
| **DIS** | First Steps' Provider Discipline |
| **YRS** | Years of First Steps Experience |
| **COH** | Cohort Number (1, 2, 3, 4, 5, 6, 7, 8, 8.5, 9, 10, 11, 12, 13, 14, 15, 16) |
| **LAUN** | District |
| **BTOT** | KCAR-R Baseline Video Total Score |
| **V1TOT** | KCAR-R Fidelity Video 1 Total Score |
| **PDSPRT** | PDS level of support |
| **IMPF** | PDS Implementation of # CEITMP Components (# or %) |
| **M1LENG** | KCAR-R Maintenance Video Score completed length after CEITMP Completion (5 levels) |
| **MITOT** | KCAR-R Maintenance Video 1 Total Score |
| **M1EOMA** | **Engagement in Optional Maintenance Activities** |

# APPENDIX E

# Variable Codes

| Identifier | Variable | Description | Recode for SPSS |
|---|---|---|---|
| **DIS** | KEIS Provider Discipline | | |
| | | DI- Developmental Interventionist | 1 |
| | | OT - Occupational Therapist | 2 |
| | | PT-Physical Therapist | 3 |
| | | SLP- Speech Language Pathologist | 4 |
| **YRS** | Years of First Steps Experience | | |
| | | (<1 auto reformatted to 1) | |
| | | 0-2 years | 1 |
| | | 3-9 years | 2 |
| | | 10-19 years | 3 |
| | | 20 or more years | 4 |
| **DT** | District | | |
| | | Barren River District | 1 |
| | | Big Sandy District | 2 |
| | | Bluegrass District | 3 |
| | | Buffalo Trace District | 4 |
| | | Fivco District | 5 |
| | | Gateway District | 6 |
| | | Green River District | 7 |
| | | Kentuckiana (KIPDA) District | 8 |
| | | Kentucky River District | 9 |
| | | Lincoln Trail District | 10 |
| | | Pennyrile District | 11 |
| **LAUN** | Launch | | |
| | | Lincoln Trail District (C1, 2, 3, 5) | 1 |
| | | Big Sandy District (4) | 2 |
| | | Bluegrass District (6, 7, 8, 8.5, 9, 10, 11, 12) | 3 |
| | | Barren River, Pennyrile (13, 14) | 4 |
| | | Green River, Gateway, Fivco, KY River (15, 16, 17) | 5 |
| | | Purchase, NKY, Buffalo Trace, Cumberland Valley, Lake Cumberland (18, 19, 20) | 6 |
| | | KIPDA (21+) | 7 |
| **PDSPRT** | PDS support to provider to complete CEITMP | | |
| | | IJP for FM or nearly met at baseline | 1 |
| | | PDS supported acceleration at Mentorship Phase | 2 |
| | | PDS supported according to schedule | 3 |
| | | PDS afforded flexibilty | 4 |
| | | PDS directed Indivdiualized Joint pLan - max support | 5 |
| **IMPF** | PDS Implementation Fidelity | | |
| | | PDS completed checklist for all components - Yes | 1 |
| | | PDS did not complete checklist for all components - No | 2 |
| **MLENG** | Length of time between ***CEITMP end and initial maintenance period | | |
| | | Initial maintenance period 2-4 months after CEITMP completion | 1 |
| | | Initial maintenance period 5-8 months after CEITMP completion | 2 |
| | | Initial maintenance period 9 months after CEITMP completion | 3 |
| | | Initial maintenance period 12 months after CEITMP completion | 4 |
| | | Initial maintenance period 18 months after CEITMP completion | 5 |
| **EOMA** | Engagement in Optional Maintenance Activities | | |
| | | Did Not Attend Refresher Meeting or View Exemplars Before submitting M1-1 | 1 |
| | | Viewed Exemplars Prior to Submitting M1-1 | 2 |
| | | Attended Refresher Group Meeting Prior to Submitting M1-1 | 3 |
| | | Both Attended Refresher Group Meeting & Viewed Exemplars Prior to Submitting M1-1 | 4 |

# APPENDIX F

# IRB Approval Letter

Human Subjects Protection Program Office
300 E. Market Street, Suite 380
University of Louisville
Louisville, KY 40202

**UNIVERSITY OF**
**LOUISVILLE**

| DATE: | August 05, 2021 |
|---|---|
| TO: | Scott D Tomchek |
| FROM: | The University of Louisville Institutional Review Board |
| IRB NUMBER: | 21.0470 |
| STUDY TITLE: | Professional Development to Promote Coaching Practices Among EI Service Providers |
| REFERENCE #: | 728896 |
| DATE OF REVIEW: | 08/01/2021 (HSPPO Staff 08/05/2021) |
| CONTACT FOR QUESTIONS: | Sherry Block 852-2163 slbloc04@louisville.edu |

This study was reviewed on 08/01/2021 by the Chair/Vice Chair of the Institutional Review Board and approved through Expedited Review Procedure, according to 45 CFR 46.110(b), since this study falls under Category 5: Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

This study was reviewed by the HSPPO staff on 08/05/2021.

This study now has final IRB approval from 08/05/2021 through 08/04/2024.

This study was also approved through 45 CFR 46.116 (D), which means that it has been granted a waiver of informed consent.

The following items have been approved:

| Submission Components | | | |
|---|---|---|---|
| Title | Version # | Version Date | Outcome |
| Protocol | Version 3.1 | 07/21/2021 | Approved |
| KCAR - Kentucky Coaching Adherence Rubric | Version 1.0 | 06/14/2021 | Approved |
| Data Collection Form & Variable List | Version 1.0 | 06/14/2021 | Approved |

Your study does not require continuing review per federal regulations. Your study has been set with a three-year expiration date following UofL local policy. If your study is still ongoing at that time, you will receive automated reminders to submit a continuing review form prior to the expiration date. If you complete your study prior to the expiration date, please submit a study closure amendment.

All other IRB requirements are still applicable. You are still required to submit amendments, personnel changes, deviations, etc... to the IRB for review. Please submit a closure amendment to close out your study with the IRB if it ends prior to the three year expiration date.

Human Subjects & HIPAA Research training are required for all study personnel. It is the responsibility of the investigator to ensure that all study personnel maintain current Human Subjects & HIPAA Research training while the study is ongoing.

**Site Approval**
Permission from the institution or organization where this research will be conducted must be obtained before the research can begin. For example, site approval is required for research conducted in UofL Hospital/UofL Health, Norton Healthcare, and Jefferson County Public Schools, etc...

**Privacy & Encryption Statement**
The University of Louisville's Privacy and Encryption Policy requires identifiable medical and health records; credit card, bank account and other personal financial information; social security numbers; proprietary research data; and dates of birth (when combined with name, address and/or phone numbers) to be encrypted. For additional information: http://louisville.edu/security/policies.

**Implementation of Changes to Previously Approved Research**
Prior to the implementation of any changes in the approved research, the investigator must submit modifications to the IRB and await approval before implementing the changes, unless the change is being made to ensure the safety and welfare of the subjects enrolled in the research. If such occurs, a Protocol Deviation/Violation should be submitted within five days of the occurrence indicating what safety measures were taken, along with an amendment to revise the protocol.

**Unanticipated Problems Involving Risks to Subjects or Others (UPIRTSOs)**
A UPIRTSO is any incident, experience, or outcome, which has been associated with an unexpected event(s), related or possibly related to participation in the research, and suggests that the research places subjects or others at a greater risk of harm than was previously known or suspected. The investigator is responsible for reporting UPIRTSOs to the IRB within 5 working days. Use the UPIRTSO form located within the iRIS system. Event reporting requirements can be found at: http://louisville.edu/research/humansubjects/lifecycle/event-reporting.
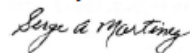
**Payments to Subjects**
In compliance with University policies and Internal Revenue Service code, payments to research subjects from University of Louisville funds, must be reported to the University Controller's Office. For additional information, please call 852-8237 or email controll@louisville.edu. For additional information: http://louisville.edu/research/humansubjects/policies/PayingHumanSubjectsPolicy201412.pdf

The committee will be advised of this action at a regularly scheduled meeting.

We value your feedback; let us know how we are doing: https://www.surveymonkey.com/r/CCLHXRP

Sincerely,

Serge A. Martinez, M.D., J.D., Vice Chair,
Biomedical Institutional Review Board

UNIVERSITY OF
**LOUISVILLE**

| DATE: | November 22, 2022 |
|---|---|
| TO: | Scott D. Tomchek |
| FROM: | The University of Louisville Institutional Review Board |
| IRB NUMBER: | 21.0470 |
| STUDY TITLE: | **Professional Development to Promote Coaching Practices Among EI Service Providers** |
| REFERENCE #: | 755993 |
| DATE OF REVIEW: | 11/22/2022 |
| CONTACT FOR QUESTIONS: | Michelle Bottorff, 852.5987, mlbott03@louisville.edu |

The amendment has been received by the Human Subjects Protection Program Office and approved by the Vice Chair of the Institutional Review Board (IRB) on 11/22/2022 through the expedited review procedure according to 45 CFR 46.110(B).

The following documents have been reviewed and approved:

| Request Application, Protocol, or Document Change | Version 1.0 | Approved as Submitted | |
|---|---|---|---|
| Study Document Title | Version # | Version Date | Outcome |
| Protocol 1.2 Revised 11.12.22 clean | Version 1.0 | 11/12/2022 | |
| Protocol Summary of Changes 11.12.22 | Version 1.1 | 11/12/2022 | |
| Data Collection Form Updated 11.12.22 | Version 1.0 | 11/12/2022 | |
| Kentucky Coaching Adherence Rubric-Revised 11.12.22 | Version 1.0 | 11/12/2022 | |

The modifications include:

We request to amend our study to expand our variables of interest. Initially we examined differences and factors associated with early intervention providers adopting and using caregiver coaching practices following a professional development program. We propose examining providers' ability to sustain fidelity and professional development specialists' (PDS) implementation with fidelity of the Coaching in Early Intervention Training and Mentorship Program (CEITMP). We request to extend our prior approved baseline and fidelity video-1 scores to now include in the deidentified dataset provider district and ratings on all videos submitted to the CEITMP for performance feedback, including maintenance phase, for approved cohorts 1-16. Additionally, we request to expand existing program data related to the timing of baseline submissions (before or after beginning the CEITMP), level of support needed for provider successful CEITMP completion, CEITMP components implemented by PDSs (fidelity), length of time between CEITMP and initial maintenance period, and provider engagement in optional maintenance activities. There is no change in the risk to participants associated with this modification.

The committee will be advised of this action at a regularly scheduled meeting.

Thank you,

*Philip Rosenbloom*

Philip Rosenbloom, M.D., Ph.D., Vice Chair, Biomedical Institutional Review Board

We value your feedback; let us know how we are doing: https://www.surveymonkey.com/r/CCLHXRP

CURRICIULUM VITA

Serena J Wheeler
1542 Cooper-Dearing Road
Alvaton, KY 42122
270-784-348
serena.wheeler@louisville.edu

## EDUCATION AND PROFESSIONAL CREDENTIALS

**Education**
Ph.D.     2023     University of Louisville, Curriculum and Instruction, Special Education
                           (expected)

M.A.E.   2004     Western Kentucky University, Interdisciplinary Early Childhood
                           Education

B.A.       1991     Lindsey Wilson College, Human Services

A.A.       1990     Lindsey Wilson College, Social Science

**Certifications**
Interdisciplinary Early Childhood Education, Kentucky, 2004 to present

## PROFESSIONAL EXPERIENCES

| | |
|---|---|
| 2017- present | University of Louisville School of Medicine, Department of Pediatrics through contract with Kentucky's Early Intervention System |

- Early Intervention Specialist Coach Lead, February 2021 to present
- Early Intervention Specialist Coach, November 2017 to February 2021

| | |
|---|---|
| 2000-2017 | Kentucky's Early Intervention System (KEIS), Barren River District |

- Developmental Interventionist, Independent, 2002-2004, 2008-2017
- Primary Level Evaluator, 2008-2017
- Developmental Interventionist, LifeSkills, 2000 -2001

| 2017-2018 | Western Kentucky University (WKU), Bowling Green, KY, Part-time Faculty, Interdisciplinary Early Childhood Education Program (IECE) |
|---|---|
| 2008-2017 | Western Kentucky University (WKU), Bowling Green, KY, Supervising Provider for IECE Field and Student Teaching Placements |
| 2010-2011 | Warren County Schools, Bowling Green, KY, Bristow Elementary, Preschool Teacher |
| 2006-2008 | Russellville Independent Schools, Russellville, KY, Stevenson Elementary, Preschool Teacher |
| 2004-2006 | Edmonson County Schools, Early Learning Center, Brownsville, KY Even Start Preschool Teacher |
| 1999-2000 | Chestnut Park Child and Family Services, Bowling Green, KY, Impact Plus Service Coordinator |
| 1991-1996 | LifeSkills, servicing Barren River District counties<br>• Mental Health Child and Family Therapist, Bowling Green, KY, 1991-1994, 1995-1996<br>• Mental Health Case Manager for adults with severe and persistent mental illness, Munfordville, KY, 1994-1995 |

## UNIVERSITY TEACHING

### Co-instructor

| EDSP 437 | Infant/Toddler Instruction, Betty Doyle, University of Louisville (Spring 2021) |
|---|---|
| EDSP 484/684 | Family Intervention for Preschool Disabilities, Jessica Hardy, University of Louisville, (Spring 2019) |
| EDSP 485 | Practicum: Developmental Intervention, Jessica Hardy, University of Louisville (Spring 2019) |

      IECE 321        Family Supports and Services, Western Kentucky University (Fall 2017, Spring 2018, Fall 2018)

      IECE 522        Family Based Services, Western Kentucky University (Spring 2018, Fall 2018)

## PRESENTATIONS AND WORKSHOPS

### National Conference Presentations

**Wheeler, S**., & Tomchek., S., (2023, March 3). Caregiver Coaching in Early Intervention: Partnering with Families [Conference session]. Council for Exceptional Childhood (CEC) Convention & Expo. Louisville, KY.

**Wheeler, S**., & Tomchek., S., (2023, March 1). Using CEC's EI/ECSE Standards to evaluate statewide professional development program [Conference session]. Council for Exceptional Childhood (CEC) Convention & Expo. Louisville, KY.

Kohner-Coogle, M., **Wheeler, S**., & Cheek, C., (2022, November 17-19). *Caregiver coaching in early intervention: A partnership to support children and families* [Pre-recorded, virtual oral seminar]. 2022 Annual Speech-Language-Hearing Association (ASHA) Convention. New Orleans, LA. Hybrid In-person-Virtual.

Tomchek., S., **Wheeler, S**., & Hardison, M., (2022, September 29). *Digital media approaches to accelerate the diffusion of innovations* [Conference session]. Division for Early Childhood (DEC) 38th Annual international conference of young children with disabilities and their families: Integrating research and practice in early childhood intervention: A joint conference from the International Society on Early Intervention (ISEI). Chicago, IL.

Tomchek., S., & **Wheeler, S**., (2022, September 28). *Measuring maintenance to coaching fidelity to inform progress monitoring* [Poster session]. Division for Early Childhood (DEC) 38th Annual international conference of young children with disabilities and their families: Integrating research and practice in early childhood intervention: A joint conference from the International Society on Early Intervention (ISEI). Chicago, IL.

**Wheeler, S**., & Tomchek., S., (2022, September 28). *Evaluation of a state-wide PD program using the EI/ECSE standards* [Conference session]. Division for Early Childhood (DEC) 38th Annual international conference of young children with disabilities and their families: Integrating research and practice in early childhood intervention: A joint conference from the International Society on Early Intervention (ISEI). Chicago, IL.

Tomchek., S., & **Wheeler, S**., (2022, February 12). *Evidence-informed State-wide Professional Development Program Enhances Early Intervention Provider Coaching Adherence Poster* [Poster session].  Conference on Research Innovations in Early Intervention (CRIEI). San Diego, CA.

Tomchek., S., & **Wheeler, S**., (2021, September 24). *Leveraging interprofessional teaming to maximize outcomes and PD* [Conference session]. 37th Annual international conference of the Division for Early Childhood (DEC). Virtual.

Tomchek., S., Dunn, W., & **Wheeler, S**., (2021, September 23). *Evidence-informed PD program enhances EI provider coaching fidelity* [Conference session]. 37th Annual international conference of the Division for Early Childhood (DEC). Virtual.

McLaren, E., Ridgley, R., & **Wheeler, S**., (2021, September 22). *Partnering with families: Building relationships through coaching* [Conference session]. 37th Annual international conference of the Division for Early Childhood (DEC). Virtual.

**Wheeler, S**., & Tomchek., S., (2021, January). *Reflective mentorship: High impact professional development* [Conference session]. 36th Annual international conference of the Division for Early Childhood (DEC). Virtual.

**Wheeler, S**., Cheek, C., Tomchek., S., Hardison, M., Pope, E., Insley, D., & Magness, M. (2019, October). *Building fidelity in early intervention coaching practices through training and mentorship* [Conference session]. 35th Annual international conference of the Division for Early Childhood (DEC). Dallas, TX.

Godfrey-Hurrell, K., Stayton, V., **Wheeler, S**., McClure, R., & Shears, A. (2016, October).  *Primary service provider model: benefits, challenges, and potential solutions* [Conference session]. 32nd Annual international conference of the Division for Early Childhood (DEC). Louisville, KY.

## State and Local Presentations

Tomchek., S., **Wheeler, S**., & Kohner-Coogle, M. (2022, February 17). *Kentucky Model of EI Built on Standards and Coaching* [Conference session]. Kentucky Speech-Language Hearing Association (KSHA). Louisville, KY. Invited

Tomchek, S., **Wheeler, S**., & Cheek, C. (2019, June). *Coaching: Early Intervention Evidence-Based Practice*. Early Childhood Institute [Conference session]. Louisville, KY.

Tomchek, S., **Wheeler, S**., & Cheek, C. (2019, March). Keynote: M*eeting the therapy needs of infants, toddlers and children with disabilities in the community. Coaching: Early Intervention Evidence-Based Practice*. PREPARE 10th Annual Conference. Lexington, KY.

Tomchek, S., **Wheeler, S**., Cheek, C., Graves, B., & Insley, D. (2018, September). *First Steps: Training providers how to use a coaching model* [Conference session]. Kentucky Occupational Therapy Association 2018 Annual Conference. Louisville, KY.

## Workshops

**Wheeler, S.,** Sanders, C., & Schaeffer, B., (2017, March). *IEP and EI Transition Workshop*. Down Syndrome of South Central Kentucky. Bowling Green, KY. (invited)

## PUBLICATIONS

## Publications: Miscellaneous

Tomchek, S. D., & **Wheeler, S.** (2022). Using the EI/ECSE personnel preparation standards to inform in-service professional development in early intervention. *Young Exceptional Children*, *25*(3), 146-157.

## Publications: Books, Chapters, & Curricula

None

## Manuscripts in Preparation/Submitted

None

# SERVICE

## National

- Division for Early Childhood (DEC) Practice Based Early Childhood Special Education (ECSE) Standards Development Task Force, July 2018 to July 2020
- Division for Early Childhood (DEC) Special Instruction Position Statement Revision Work Group, March 2023 to present

## State

- Kentucky Education Professional Standards Board /Educational Testing System, IECE Test Revision Panel 2007-2008

## Local
- District Early Intervention Council-Barren River Region, Bowling Green, KY, 2001 - 2004


# PROFESSIONAL COMMITTEE WORK

## EI/EC PD CoP

- DEC Early Intervention/Early Childhood Professional Development Community of Practice Participant, 2021 to present
- DEC Early Intervention/Early Childhood Professional Development Community of Practice, Coaching workgroup member, 2022 to present

## University –College- Department

- U of L, Interdisciplinary Early Childhood Education Program – Assistant Professor (Tenure Track) Search Committee, Spring 2021
- WKU MAE, Interdisciplinary Early Childhood Education Program Curriculum Focus Group, WKU, May 2015
- WKU Interdisciplinary Early Childhood Education Program –Associate Professor Search Committee, Winter 2005
- WKU Interdisciplinary Early Childhood Education Program Curriculum Development Committee, 2003-2004

DEC Practice Based Early Childhood Special Education (ECSE) Standards Force

## Kentucky Early Intervention System

- State Systemic Improvement Plan (SSIP) Sub-workgroup, First Friday Focus, Frankfort, KY, 2021 to present.
- Kentucky Child Outcomes Workgroup for revising targets for OSEP child outcomes, Fall 2019

**Community**

- The Foundry Early Childhood Team, Broadway United Methodist Church, 2014

## PROFESSIONAL AFFILIATIONS

- Council for Exceptional Children (CEC)
    - Division: Division for Early Childhood (DEC)

- Former Member
    - o National Association for the Education of Young Children (NAEYC)
    - o National Education Association (NEA)
    - o Kentucky Education Association (KEA)

## HONORS AND AWARDS

- Kathleen W. McCartan Award, Division for Early Childhood (DEC) of the Council for Exceptional Children (CEC), Washington D.C., 2003
- Human Services Award, Lindsey Wilson College, Columbia, KY, 1991

## GRANT WRITING/INVOLVEMENT

None

## GUEST LECTURES

**Working with Families,** IECE Department EDSP 484/684 Dr. Margaret Gravil, University of Louisville, February 27, 2020