



# Tailored Teaching: Teachers' Use of Ongoing Child Assessment to Individualize Instruction

Volume II: A Review of the Literature



OPRE Report 2014-15  
June 2014





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Contract Number: HHSP23320095642WC/HHSP23337041T

Mathematica Reference Number: 40158

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**Suggested citation:**

Akers, L., P. Del Grosso, S. Atkins-Burnett, K. Boller, J. Carta, and B.A. Wasik. "Tailored Teaching: Teachers' Use of Ongoing Child Assessment to Individualize Instruction (Volume II)." Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation, 2014.

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This report and other reports sponsored by the Office of Planning, Research and Evaluation are available at <http://www.acf.hhs.gov/programs/opre/index.html>.





## ACKNOWLEDGEMENTS

The authors are grateful for the assistance we received in the development of this report. We benefited from the oversight, guidance, and vision of Jennifer Brooks, our federal project officer at the Office of Planning, Research, and Evaluation (OPRE), as well as OPRE Society for Research in Child Development Fellows Nina Philipsen Hetzner and Kelly Fisher. We appreciate the ongoing input of Amanda Bryans from the Office of Head Start. We appreciate the input and perspective about the needs of the national program and the research community provided by Office of Head Start and OPRE staff members. We were fortunate to have the expertise of our expert panel members, whose guidance helped ensure that we covered the most important topics in the ongoing assessment for individualization process.

Finally, we are grateful to colleagues at Mathematica who contributed their expertise, time, and effort to this project. These included Felicia Hurwitz, who served ably as project manager; Claire Smither Wulsin, who was integral to the literature review, and Emily Moiduddin and Nikki Aikens, who provided thoughtful quality assurance. The report benefited from the editorial support of Kelly Kramer. Barbara Collette and Karen Groesbeck formatted and produced both volumes.

While acknowledging our indebtedness to these many individuals, the authors take responsibility for any errors or omissions that remain. The views expressed in this report do not necessarily reflect those of the Administration for Children and Families or the Department of Health and Human Services.

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## CONTENTS

OVERVIEW.....	xiii
I INTRODUCTION.....	1
A. Historical Roots of Ongoing Child Assessment for Individualization.....	1
1. Goals and Uses of Ongoing Child Assessment.....	2
2. Approaches to Ongoing Assessment in Early Childhood.....	3
B. Purpose of the Literature Review and Methodology.....	5
C. Characteristics of the Literature Reviewed.....	6
1. Study Designs.....	6
2. Domain and Context.....	6
3. Sample Characteristics of Interest.....	8
D. Organization of the Literature Review.....	8
II IDENTIFYING CRITICAL AREAS FOR THE SUCCESSFUL IMPLEMENTATION OF ONGOING ASSESSMENT FOR INDIVIDUALIZATION.....	9
A. The Limited Literature on Selecting an Assessment Method and Target Largely Describes Best Practices.....	10
B. Research Recommends Using Multiple Approaches to Documenting and Organizing Information to Support Interpretation.....	12
C. Teachers Use a Variety of Supports to Interpret and Apply Data to Instruction.....	14
D. Families May Be Important Partners in the Collection and Interpretation of Ongoing Assessment Data.....	16
E. Teachers May Need Support to Overcome Barriers to Using Ongoing Assessment for Individualization.....	17
1. Teachers Recognize Value of Ongoing Assessment but Do Not Consistently Collect or Use Ongoing Assessment Data.....	18
2. Lack of Knowledge May Limit Teachers' Use of Ongoing Assessment Data to Inform Instruction; Teachers Desire Additional Training and Support.....	19
3. Limited Research on the Effectiveness of Teacher Supports for the Use of Ongoing Assessment to Individualize Instruction.....	20
F. Strengths and Limitations of the Literature.....	22

III	ASSESSING THE IMPLEMENTATION OF ONGOING CHILD ASSESSMENT (PARTICULARLY TO INDIVIDUALIZE INSTRUCTION) .....	23
	A. Overview of the Studies That Measure the Implementation of Ongoing Assessment .....	24
	B. Specific Measures of Implementation Identified in the Literature .....	25
	1. Measures of What Teachers Do.....	25
	2. Measures of What Teachers Think .....	27
	3. Measures of What Teachers Know .....	28
	C. Strengths and Limitations of the Literature.....	28
IV	IMPLICATIONS FOR THE DEVELOPMENT OF A MEASURE AND FUTURE RESEARCH.....	31
	A. Implications for the Development of a Measure .....	31
	1. Limited Rigorous Evidence on Key Activities in the Process; Largely Best Practices.....	32
	2. Limited Examples of Measures of Teacher Implementation; None Sufficiently Comprehensive.....	32
	B. Implications for Future Research .....	33
	REFERENCES.....	35

APPENDIX A: Definitions Of Key Terms Related To Ongoing Assessment

APPENDIX B: Ongoing Assessment Tools Commonly Used In Early Childhood Education

APPENDIX C: Literature Review Methods

APPENDIX D: Template For Reviewing Studies

## TABLES

I.1	Designs of the Studies Included in the Review .....	7
II.1	Characteristics of Studies and Study Samples Reporting on Data Collection Methods.....	11
II.2	Commonly Cited Methods of Data Collection.....	12
II.3	Characteristics of Studies and Study Samples Reporting on Data Documentation and Organization Methods .....	13
II.4	Commonly Cited Methods of Data Documentation .....	14
II.5	Characteristics of Studies and Study Samples Reporting on the Interpretation and Application of Data to Instruction.....	15
II.6	Characteristics of Studies and Study Samples Reporting on Engaging Families in Ongoing Assessment .....	17
II.7	Characteristics of Studies and Study Samples Reporting on Teachers' Perceptions of and Knowledge of Ongoing Assessment and Using Data to Inform Instruction .....	19
II.8	Characteristics of Studies and Study Samples Reporting on Training Offered to Teachers Support Their Use of Ongoing Assessment and Using Data to Individualize Instruction .....	21
III.1	Characteristics of Studies and Study Samples Reporting on Assessment of Implementation of Ongoing Assessment .....	24

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## OVERVIEW

This report summarizes the findings of a literature review conducted as part of the *Assessing Early Childhood Teachers' Use of Child Progress Monitoring to Individualize Teaching Practices* project funded by the Office of Planning, Research and Evaluation within the Administration for Children and Families at the U.S. Department of Health and Human Services. The purposes of the project are to develop a conceptual model of early childhood teachers' use of ongoing child assessment to individualize instruction and to create a measure that assesses teacher implementation of that process; this measure will be called the Tool for Tailored Teaching (T3; see Volume I of this report). The literature review summarized in this volume was designed to (1) identify the critical areas to be addressed by a measure of teachers' use of ongoing assessment for individualization and (2) find examples of how others have measured teachers' use of ongoing assessment for individualization.

Overall, limited rigorous evidence is available about the areas critical for the successful implementation of ongoing assessment to individualize instruction. The literature does not provide guidance on how to determine whether these activities are well-implemented, nor does it describe the factors that influence teachers' abilities to implement the activities well. Although the literature does present a picture of the activities we are likely to see when teachers use ongoing child assessment data for individualization, that picture is incomplete and largely limited to the early elementary level in the domain of language and literacy. Limited research is available about some of the activities involved in this ongoing assessment process, and most of the studies focused on one or two of the activities, leaving few examples that focus on the process in its entirety. Few causal studies have examined the types of ongoing support for teachers, particularly teachers working with children from birth to age 5, that may lead to improvements in both teacher's use of ongoing assessment data to individualize instruction and, ultimately, child outcomes.

Of the 173 studies reviewed, only 21 attempted to measure teachers' implementation of ongoing assessment and the individualization process. Only some of those studies provided detailed information about the measures used to assess implementation, and more than half were conducted at the early elementary level. The literature does provide some examples of measures that assess how well teachers implement ongoing assessment tools and whether teachers make any instructional modifications in response to ongoing assessment data. However, the literature provides few examples of measures that assess two important areas: (1) how teachers make instructional decisions based on these data and (2) the knowledge and skills necessary for teachers to successfully implement ongoing assessment for individualization, especially with infants, toddlers, and preschoolers and in home visiting settings. Across all dimensions of implementation, we lack evidence linking assessments of teacher implementation of ongoing assessment to child outcomes.

This review points to a number of gaps in the knowledge base about ongoing assessment for individualization that future research should address. The T3 measure will build on the current literature and extend beyond it by capturing an array of the activities involved in the process and assessing implementation across a range of ongoing assessment tools. Ultimately, research will be needed to determine whether high-quality implementation of ongoing assessment to inform individualization as assessed with the T3 is linked to improved instructional practices and, ultimately, positive child outcomes.

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## CHAPTER I. INTRODUCTION

This report summarizes the findings of a literature review conducted as part of the *Assessing Early Childhood Teachers' Use of Child Progress Monitoring to Individualize Teaching Practices* project<sup>1</sup> funded by the Office of Planning, Research and Evaluation (OPRE) within the Administration for Children and Families (ACF) at the U.S. Department of Health and Human Services. The project is being conducted under contract by Mathematica Policy Research and its partners, Temple University (under Barbara Wasik) and Judith Carta of the University of Kansas. This review summarizes the current literature on ongoing child assessment and gathers information to inform the development of a measure of early childhood teachers' use of ongoing assessment for individualization. This second volume accompanies the report's first volume, which presents a conceptual framework and measurement plan that build on the review presented in this volume.

The project is designed to develop a conceptual model of teachers' use of ongoing assessment for individualizing instruction and supporting practices to enhance children's school-readiness. The study's conceptual model serves as the foundation of a measurement plan for developing a measure of teachers' use of ongoing child assessment to tailor instruction to children's needs, called the Tool for Tailored Teaching (T3; see Volume I of this report<sup>2</sup>). The next phase of this work will include the development of the T3 as a preschool-age, classroom-based instrument to measure the implementation and quality of ongoing assessment systems.

In this chapter, we begin by describing the historical roots of ongoing child assessment for individualization. Next, we describe the purpose of the literature review and present an overview of our methods. We subsequently contextualize the findings by presenting characteristics of the literature reviewed, including study designs, sample characteristics, and learning and developmental domains addressed. We then provide a roadmap to subsequent chapters of the report, in which we present the findings.

### A. Historical Roots of Ongoing Child Assessment for Individualization

Assessment has long played a critical role in examining whether early education promotes children's readiness for school. For many years, summative uses of assessment were the most frequent in classrooms—providing information about children's developmental status at different times and their performance relative to peers or to specified criteria. In recent years, increased attention has been given to how teachers use ongoing assessment to adjust instructional or caregiving practices and content and thus better meet the individual strengths, needs, and interests of young children. Individualization of teaching is considered a “best practice” in early education programs (National Association for the Education of Young Children 2005; Sandall et al. 2000) and is a requirement in the Head Start Program Performance Standards (45 CFS Sec 1307.3(b)(2)(ii); Federal Register 2011). For instance, the Head Start Program Performance Standards require that programs analyze “individual ongoing, child-level assessment data for all children birth to age five

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<sup>1</sup> This project focuses on all forms of ongoing child assessment, of which child progress monitoring is a common form. The content of this report will be broader than the title of the project implies. For more information, see the section of this report entitled “Goals and Uses of Ongoing Child Assessment.”

<sup>2</sup> Atkins-Burnett et al. 2014

participating in the program and [use] that data in combination with input from parents and families to determine each child's status and progress with regard to, at a minimum, language and literacy development, cognition and general knowledge, approaches toward learning, physical well-being and motor development, and social and emotional development and to individualize the experiences, instructional strategies, and services to best support each child."

## **1. Goals and Uses of Ongoing Child Assessment**

Ongoing child assessment refers to the process of "continuing observation and documentation teachers complete to determine whether teaching practices need to be adapted to better meet children's needs" (National Center on Quality Teaching and Learning 2012). In other words, teachers use ongoing child assessment to monitor a child's progress over time and then individualize instruction to improve the child's progress. In this context, we use the term "individualized" to refer to instruction that is responsive to each child's unique strengths and challenges through modifications that better meet the child's individual needs. These modifications might include increased opportunities to practice a skill, knowledge, or behavior; changes in curriculum; adaptations of instructional approaches; and environmental or other supports. We use the term "individualization" to describe the process of using data to identify a child's skill level with regard to a specific goal and to determine and implement the type of learning opportunities needed to promote the child's growth. Through individualization, a practitioner uses individual child data to determine both the content and instructional (or caregiving) strategies needed to support a child's learning. Data are gathered as part of a continual process to monitor the child's response and to change instruction or caregiving to ensure the child's continual growth.

Across fields (such as special education, K–12 education, and early childhood education) and even within the same field, ongoing assessment takes on different forms, employs different methods, and pursues different goals. One common form of ongoing assessment in K–12 education is called "progress monitoring." Progress monitoring is a scientifically based practice that assesses children's performance in a variety of domains and employs child data to inform, evaluate, and modify instructional practices (National Center on Student Progress Monitoring 2012). Progress monitoring is typically used in K–12 education to identify children at academic risk and to ascertain skill deficits (Safer and Fleischman 2005). It is used to inform decisions about instructional strategies and grouping practices, determine skill strengths and deficits, screen children for potential school failure, and provide information on eligibility for access to services (Foegen et al. 2007; Fuchs et al. 1991). One of the wide-scale applications of progress monitoring in K–12 education is in "Response to Intervention" (RTI; Gersten et al. 2009; Hamilton et al. 2009)—an approach to "earlier intervention" that includes universal screening of all students at regular intervals throughout the year. RTI allows children who are not progressing as expected to receive more intensive support. Progress monitoring is then used to determine whether the higher levels of instructional intensity (for example, increased time in focused small-group instruction) improve students' rates of growth. RTI approaches have also been developed for young children (Division for Early Childhood of the Council for Exceptional Children 2013). For example, "Recognition and Response" refers to one adaptation of RTI for the preschool population (Buyse and Peisner-Feinberg 2013).

Just as practices vary in this arena, the language used to describe this process also varies. Appendix A defines various key terms related to ongoing assessment in early childhood, preschool, and K–12 education; we derived definitions for these terms using the literature included in the review and input from the project's expert consultant group.

In an early education ongoing child assessment system, collecting data on a child's performance (either relative to normative peers or criterion-referenced information) is only the first aspect of individualizing. Other available information should be used as a complement to the ongoing assessment data (McConnell and Greenwood 2013; Buysse and Peisner-Feinberg 2013). Exploration of the child's strengths and challenges may inform the most promising types of instructional strategies. If assessment indicates a delay or other need for adaptations or individualization, more frequent assessment may occur to explore possible causes of this issue in child functioning and how it might be addressed. In some cases, a child may be referred for further evaluation and treatment. After an approach to individualizing is selected and implemented, ongoing assessment can continue to help educators understand whether the instructional change may be associated with improvements in the child's performance (McConnell and Greenwood 2013).

In the context of this project, we refer to four purposes of ongoing child assessment: (1) to inform the teacher's instruction for the entire group and individualization for each child; (2) to monitor whether current instructional approaches are supporting children; (3) to decide whether additional support or modifications to instruction are needed; and (4) when appropriate, to identify whether the child's rate of growth has changed in response to the support or modification. Overall, in early childhood settings, the information from ongoing assessment is used to track progress and then scaffold children's learning to support their acquisition of school-readiness.

## **2. Approaches to Ongoing Assessment in Early Childhood**

Early childhood programs use one of two approaches to ongoing assessment: (1) curriculum-embedded approaches and assessments tailored to them and (2) general outcome measures (GOMs) or curriculum-based measures (CBMs). For each of these approaches, computer- or web-based tools are available to support data management and instructional decision-making, including individualization. Appendix B includes brief descriptions of the ongoing assessment tools commonly used in early childhood education. In this section, we highlight key features of the approaches to ongoing assessment; understanding the differences and similarities among these approaches is important as we develop a measure of teachers' use of ongoing child assessment to support individualization.

**Curriculum-embedded approaches.** Curriculum-embedded approaches are used to assess children's progress relative to early learning standards and the skills and knowledge taught via a specific curriculum. Assessment information in curriculum-embedded approaches is often collected within the context of curriculum delivery. Typically, the tasks align closely with the curriculum and are intended to be authentic in context; that is, "opportunities created for children that reflect typical experiences rather than discrete isolated tasks that are irrelevant to the child's daily life" (Pretti-Frontczack et al. forthcoming, p. 59). Some curriculum-embedded assessments are created by the curriculum developers (curriculum-based assessments; see, for example, High Scope Educational Foundation 2003); other curriculum-embedded assessments are derived from national standards and developmental expectations (see, for example, Dichtelmiller et al. 2001). Performance on tasks is typically assessed in relation to indicators on rubrics provided by the curriculum-embedded assessment system. The rubrics indicate different levels of progress toward end-of-year goals but rarely provide guidance regarding expectations for progress throughout the year. Although embedded within the daily activities and aligned with curriculum goals, the specific activities and tasks used for assessment of each area are not standardized. Therefore, teachers use varied sources of evidence for progress.

Examples of curriculum-embedded approaches that are commonly used in early childhood education include Assessment, Evaluation, and Programming System for Infants and Children (AEPS; Bricker 2002); Child Observation Record (COR; HighScope Educational Foundation 2003); Galileo G3 Assessment Scales for children ages 3–5 (Feld 2011); Hawaii Early Learning Profile (HELP 0-3 and HELP 3-6, 2nd Edition; Vort Corp. 2006, 2010); Learning Accomplishment Profile (LAP; Hardin and Peisner-Feinberg 2004) and Early Learning Accomplishment Profile (E-LAP; Hardin and Peisner-Feinberg 2001); The Ounce Scale (Meisels et al. 2003); Teaching Strategies: GOLD (Teaching Strategies, Inc. 2011); and Work Sampling System (WSS; Dichtelmiller et al. 2001). Program directors participating in the nationally representative Head Start Family and Child Experiences Survey (FACES) and the Early Head Start Family and Child Experiences Study (Baby FACES) (Hulsey et al. 2010; Vogel et al. 2011) reported using instruments for curriculum-embedded approaches more often than GOMs as their primary child assessment method.

**General outcome measurement or curriculum-based measurement.** General outcome measurement (GOM) is the continuous, frequent, and standard assessment of child progress toward a long-term goal or outcome used primarily at the preschool and infant and toddler levels. Central to the content development of a GOM is the repeated measurement across time of the same key skill elements (a subset of skills that represent the entire set of skills required to achieve a targeted outcome). Thus, a child's increasing proficiency on a GOM is indicated by improved performance on the same key skill elements repeatedly measured over time. In GOM, measurement focuses on just a few key skill elements and not the universe of possible age-appropriate skills. The Individual Growth and Development Indicators (IGDIs) for Infants and Toddlers (Greenwood et al. 2011b; Missall et al. 2008), the Preschool IGDIs (Greenwood et al. 2006, 2011b; Roseth et al. 2012), and m-CLASS CIRCLE (Wireless Generation 2010) are examples of commonly used GOMs.

Curriculum-based measurement (CBM) is a research-based approach to ongoing assessment that preceded the development of GOM and is used primarily in elementary and secondary schools. Like GOM, CBM looks at child progress across an entire program year; however, CBM focuses on curricular content rather than general developmental outcomes. CBM involves brief tests that sample from across the full-year curriculum (based on national curriculum standards rather than a specific curriculum) to assess progress (Fuchs and Fuchs 2011). Alternate forms with psychometric evidence of equivalence are administered at regular intervals (often weekly) in a standardized way to ensure reliable and valid scores. Examples of CBMs include the Number Sense Screener (NSS; Jordan and Glutting 2012); the Texas Primary Reading Inventory (TPRI; Texas Education Agency 2010b), and El Inventario de Lectura en Español de Tejas (Tejas LEE; Texas Education Agency 2010a); and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good et al. 2001; Kaminski and Good 1996).

**Validity and reliability of GOMs and curriculum-embedded approaches.** These two approaches to ongoing child assessment pose trade-offs in terms of their psychometric properties. With regard to validity, GOMs may encounter ecological and cultural biases that curriculum-embedded approaches do not. Specifically, GOMs may ask children to complete tasks that do not fall into the usual patterns of their classroom or home, thus introducing ecological bias; alternatively, if the standardized task is ecologically valid for some children and not others, it may introduce cultural bias. By contrast, authentic tasks such as those used in curriculum-embedded approaches are ecologically valid because they fit within the usual patterns of the classroom (even if not those of each child's home). However, across both GOMs and curriculum-embedded approaches, the availability of measures with validity evidence for monitoring progress is limited. Of those measures with predictive validity evidence, most are in the domains of language and literacy and math (Peisner-Feinburg and Buysse 2013; Halle et al. 2011).

With regard to reliability, GOMs typically use brief, standardized metrics with a clearly delineated task that requires little staff expertise or training, thus facilitating their reliability. By contrast, the authentic tasks used in curriculum-embedded approaches can differ widely and rely on greater teacher knowledge and skill in assessment. Therefore, teachers must document assessment results objectively and completely to draw reliable inferences about instructional modifications; otherwise, they may introduce bias by describing what they think rather than what they actually observe about a child. (For more information about the strengths and weaknesses of GOMs and curriculum-embedded approaches, see Volume 1 of this report.)

## **B. Purpose of the Literature Review and Methodology**

The ultimate goal of this review was to inform development of a measurement plan to assess whether and how early childhood teachers use ongoing assessment for individualization of instruction. Evidence and theory identified through the literature informed the project's conceptual framework for the use of ongoing child assessment to individualize instruction, which in turn served as the foundation of a plan to measure teachers' implementation of ongoing assessment to individualize instruction and better meet children's needs. The literature review findings inform identification of key constructs that the T3 measure needs to capture to measure teachers' use of ongoing child assessment for individualizing instruction, as well as potential approaches to measuring those constructs. As such, the immediate goals of the literature review are to:

- Identify key concepts that should be included in a measure of early childhood teachers' use of ongoing assessment for individualization
- Find examples of how others have measured teachers' use of ongoing assessment for individualization.

Throughout the review, we purposively focus on features common to ongoing assessment systems across such characteristics as:

- Child population (such as children with and without an Individualized Education Plan or Individualized Family Service Plan)
- Domain (such as language, literacy, mathematics, and social and emotional)
- Study design (such as empirical and conceptual)
- Form of using ongoing assessment for individualization (such as progress monitoring within RTI systems, formative assessment in primary education, and ongoing assessment in early childhood).

To identify studies for review, we conducted a library search. The search targeted research related to early childhood education (which we defined as including children from birth through 3rd grade) and early childhood special education. The search was limited to references from the past 10 years (2002–2012). (For a full list of search terms and parameters, see Appendix C, Table C.1.)

Professional library staff conducted searches in EBSCOhost and Sage. In addition, some members of the expert consultant group recommended research for the literature review, including research that was not yet published. Together, the library search and the expert recommendations identified 1,325 unduplicated references (1,281 references from the library search and 44 from the

expert recommendations). A team of three trained reviewers carefully screened all references for relevance. Based on a set of criteria determined by the project team, this process resulted in 173 references that were screened as relevant for this review (Appendix C, Table C.2). The review team used a standard form (Appendix D) to allow consistent collection of information across studies, chapters, and reports. We extracted information from relevant research along key dimensions identified in consultation with ACF.

## **C. Characteristics of the Literature Reviewed**

We recognize that the age groups within the span of this review have different instructional needs and carry different implications for the implementation of ongoing assessment for individualization. Consequently, in our description of the characteristics of the literature reviewed in this chapter and in the remainder of the report, we disaggregate our findings by three age groups: (1) early elementary (kindergarten through 3rd grade), (2) preschool, and (3) infants and toddlers. Of the 173 studies<sup>3</sup> that we reviewed, 34 reported on more than one age group. The age category subtotals in Table I.1 reflect double counting of studies that reported on more than one age group. Across all 173 studies, 92 discussed the use of ongoing assessment to individualize instruction with students in early elementary school (some studies also included students beyond 3rd grade), 80 with children in preschool, and 35 with infants and toddlers.

### **1. Study Designs**

Of the 173 studies included in the review, almost half (48 percent) were empirical studies (see Table I.1). The empirical studies included 56 descriptive studies (of which 25 were psychometric), 15 randomized controlled trials (RCTs), 7 quasi-experimental designs (QEDs), and 5 single-case designs (SCDs). Of the studies included in the review, 36 percent were conceptual pieces, 13 percent were guides that provided overviews of best practices or standards, and 2 percent were literature reviews or reviews of measures.

The distribution of study designs at both the early elementary and preschool levels approximately mirrors the distribution across all 173 studies, with empirical and conceptual studies together making up more than 80 percent. Of studies at the infant and toddler level, fewer were empirical, and more were guides than at the other two age levels (about one-third were empirical, approximately one-third were conceptual, and about one-quarter were guides that presented best practices or standards for implementing ongoing assessment).

At the beginning of each section of the report, we include a table highlighting the characteristics of the studies referenced therein. The tables are organized by the age level that the studies target (elementary, preschool, or infant and toddler) and include information about study type and design, domain, and selected characteristics of the target population.

### **2. Domain and Context**

Across and within all age groups, studies most commonly discussed the use of ongoing child assessment in the domains of language, literacy, or reading (47 percent of all studies). Overall, far

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<sup>3</sup> Throughout the remainder of this report, a “study” refers to any reference included in the review, including empirical studies, conceptual pieces, best-practice guides, and literature reviews.

fewer studies focused on the use of ongoing assessment in the domains of mathematics (16 percent) and social and emotional or behavioral outcomes (16 percent). The distribution of studies across outcome domains at both the early elementary and preschool levels is fairly similar to the overall distribution. Only the infant and toddler level had a more even distribution of studies across outcome domains, with 37 percent focused on language and literacy outcomes, 31 percent on social and emotional or behavioral outcomes, and 29 percent on cross-domain outcomes (including developmental outcomes). It is important to note that 29 percent of the studies did not specify a domain and that some addressed more than one domain.

**Table I.1. Designs of the Studies Included in the Review**

	Percentage (Number) of Studies			
	Total <sup>b</sup>	Early Elementary	Preschool	Infant/Toddler
<b>Study Design</b>				
Empirical	48 (83)	45 (41)	46 (37)	37 (13)
<i>Descriptive—Non-Psychometric</i>	18 (31)	16 (15)	18 (14)	11 (4)
<i>Descriptive—Psychometric</i>	14 (25)	14 (13)	16 (13)	14 (5)
<i>RCT</i>	9 (15)	9 (8)	6 (5)	6 (2)
<i>QED</i>	4 (7)	3 (3)	5 (4)	0 (0)
<i>SCD</i>	3 (5)	2 (2)	1 (1)	6 (2)
Conceptual	36 (63)	41 (38)	35 (28)	31 (11)
Guide (best practices/standards)	13 (23)	12 (11)	14 (11)	26 (9)
Literature review or meta-analysis	2 (4)	2 (2)	5 (4)	6 (2)
<b>Domain<sup>a</sup></b>				
Language/literacy	47 (81)	46 (42)	50 (40)	37 (13)
Mathematics	16 (28)	23 (21)	11 (9)	3 (1)
Social and emotional	16 (28)	12 (11)	15 (12)	31 (11)
Science	2 (3)	2 (2)	1 (1)	0 (0)
Motor development	1 (2)	1 (1)	1 (1)	6 (2)
Not specified	29 (51)	25 (23)	33 (26)	29 (10)
<b>Selected Characteristics of the Target Population</b>				
Children with disabilities	40 (69)	43 (40)	33 (26)	26 (9)
Children in Head Start or Early Head Start	20 (34)	NA	43 (34)	34 (12)
<b>Total Number of Studies</b>	<b>173</b>	<b>92</b>	<b>80</b>	<b>35</b>

Note: Percentages may not total to 100 because of rounding.

<sup>a</sup> Some studies did not report domain, and others reported on more than one domain.

<sup>b</sup> Thirty-four studies reported on more than one age group and are double-counted in the three age-specific columns. Thus, the total number of studies in the three age-specific columns sums to more than 173.

RCT = randomized controlled trial.

QED = quasi-experimental design.

SCD = single-case design.

NA = not applicable.

Among the 83 empirical studies included in the review, some were about ongoing assessment implemented within general practice; others were assessing a specific intervention (such as a professional development program for teachers) but within the context of general practice (not shown). A few studies examined ongoing assessment within the context of a broader intervention (including Early Reading First, Reading First, the Exemplary Model of Early Reading Growth and Excellence [EMERGE], Success for All, First Steps to Success, and Pittsburgh's Early Childhood Initiative [ECI]). In these contexts, findings about teachers' use of ongoing assessment may be specific to the intervention and therefore not generalizable to all ongoing assessment systems.

### **3. Sample Characteristics of Interest**

Forty percent of all studies included discussions on using ongoing assessment with children with disabilities, including 43 percent of studies on early elementary students, 33 percent of studies on preschoolers, and 26 percent of studies on infants and toddlers.<sup>4</sup> Twenty percent of studies included children enrolled in Head Start or Early Head Start programs, including 43 percent of studies at the preschool level and 34 percent of studies at the infant and toddler level.

### **D. Organization of the Literature Review**

In Chapters II and III of this volume, we present findings from the literature review. In Chapter II, we present five areas identified in the literature as key to the successful implementation of ongoing child assessment to individualize instruction: (1) selecting an observation or assessment method and target, (2) documenting and organizing information, (3) interpreting and applying data to instruction, (4) engaging families, and (5) supporting teachers. In Chapter III, we provide examples from the literature of how others have measured the implementation of ongoing assessment (particularly to individualize instruction). We conclude with Chapter IV, in which we summarize the implications of the findings from the literature for the development of a measure of teachers' use of ongoing assessment to individualize instruction. We also describe implications for future research that can help strengthen the field's understanding of teachers' use of ongoing assessment to individualize instruction with children birth through age 5.

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<sup>4</sup> Because this review focuses on features common to ongoing assessment systems across different child populations, we do not differentiate between children with and without an Individualized Education Plan (IEP) or Individualized Family Service Plan (IFSP).

## CHAPTER II. IDENTIFYING CRITICAL AREAS FOR THE SUCCESSFUL IMPLEMENTATION OF ONGOING ASSESSMENT FOR INDIVIDUALIZATION

### Key Findings

Overall, limited rigorous evidence is available about the areas critical for the successful implementation of ongoing child assessment to individualize instruction. However, the existing literature does give us an understanding of the perceived best practices in implementing these activities, as well as the range of activities we are likely to see in early childhood settings, as outlined below.

- ***The limited literature on selecting an assessment method and target largely describes best practices.*** Studies recommend that assessment methods be authentic, ongoing, developmentally appropriate, individualized, natural, and multifaceted. Several studies recommend selecting assessment targets that align with and measure critical outcomes of the curriculum, are teachable, are observable or measurable, are generalizable, and are universally designed.
- ***Researchers recommend that teachers use multiple approaches to documenting and organizing information to support interpretation.*** Methods for documenting information include checklists, ratings, anecdotal records, questionnaires, videos, and/or developmental scales. Examples of systems for organizing information include portfolios for compiling data from multiple sources; graphs; Excel spreadsheets, Access databases, or paper-based systems; and web-based or technology-enhanced systems to support documenting and organizing data.
- ***Teachers use a variety of supports to interpret and apply data to instruction.*** To help them interpret data, teachers may rely on coaches or mentors, decision points set by programs, and web-based or technology-enhanced systems. When teachers use ongoing assessment data for individualization, they may use it to help them form and instruct small groups, create and implement tiered tasks or lesson plans, and identify children in need of one-on-one assistance.
- ***Families may be important partners in the collection and interpretation of ongoing assessment data.*** Although we lack clear recommendations from recent empirical work, studies that discuss engaging families in ongoing child assessment describe families as important partners in the collection and interpretation of data.
- ***Teachers may need support to overcome barriers to using ongoing assessment for individualization.*** The literature suggests that (1) teachers may recognize the value of ongoing assessment, though they do not consistently collect ongoing assessment data nor do they use it for instruction and individualization, (2) barriers to using data include lack of pedagogical content knowledge and knowledge of assessment and interpretation of data, and (3) teachers want more training and professional development on using ongoing assessment to individualize instruction. Approaches to supporting teachers in making instructional decisions based on data include coaching and providing teachers with technology-enhanced systems to assist with the interpretation and use of data. These systems may offer more immediate and tailored feedback to teachers and, in turn, may lead to better instructional decision making and more positive outcomes for children. Comprehensive professional development seems to be more effective than no professional development, and professional development appears to be more effective when it includes technology-driven support.

In this chapter, we describe current research on various activities involved in implementing ongoing assessment to individualize instruction. We theorized that these activities should be measured when assessing teachers' use of ongoing assessment for individualization. The activities we focused on include selecting an observation or assessment target and method, documenting and organizing information on children's progress, interpreting and applying data to inform instruction and individualization, and engaging families. We also present research on teachers' experiences with and knowledge of ongoing assessment, as well as training and supports that may assist teachers in the use of ongoing assessment to individualize instruction. As we described in Chapter I, the overall goal of this review was to inform development of a measurement plan to assess whether and how teachers use ongoing child assessment for individualization of instruction. Throughout, we highlight findings that are particularly relevant to that goal. We also present findings from the literature that provide useful contextual information and identify where there is little evidence to inform a measurement plan. In each section, we include a table that lists the characteristics of the studies and study samples that were reviewed.

### **A. The Limited Literature on Selecting an Assessment Method and Target Largely Describes Best Practices**

Ongoing monitoring of child progress begins with the selection of an assessment target (the objective that will be assessed) and method (how that objective will be assessed), both of which are influenced by the assessment system. Some assessment systems define the selection of an assessment target and method; others let the teacher define it. Specifically, GOMs and CBMs typically define the target and method, while most curriculum-embedded approaches rely on teachers to determine which targets to assess and how to assess them within their curricular activity.

**No studies on teacher-level selection of assessment system and method.** In the studies reviewed, recommendations for selecting an assessment system were discussed at the program level; that is, assessment systems are typically selected by managers and not the practitioners who implement them. Likewise, no studies focused specifically on teacher-level decision making related to selecting an assessment method. In early childhood education, researchers have promoted the use of authentic assessments for instructional planning (defined as systematic recording of developmental observations over time about the naturally occurring behaviors and functional competencies of young children in daily routines by familiar and knowledgeable caregivers in the child's life) over the use of standardized, norm-referenced tests (Bagnato et al. 2010, 2011). Some researchers maintain that authentic assessments are better suited for the early childhood context because they are "developmentally appropriate, representative, accurate, functional, and strengths based, especially for children with disabilities" (Bagnato et al. 2011). Pretti-Frontczak and colleagues (forthcoming) reviewed practice standards for assessment from professional organizations, various committee reports, and legislative policies. They summarized six common themes related to assessment practices for early childhood education, concluding that assessments should be (1) authentic (through the use of tasks "that reflect typical experiences rather than discrete isolated tasks that are irrelevant to the child's daily life"), (2) ongoing, (3) developmentally appropriate, (4) individualized, (5) natural (through the use of structured observations of children doing typical tasks within their usual routine and setting), and (6) multifaceted (through the use of multiple sources and approaches to assessment). (It is important to note that a long-standing tension exists between the use of standardized tasks versus authentic activities for ongoing assessment. For more information, see Chapter I of this volume as well as Volume I, Chapter II, of this report.) In the literature we reviewed, observations were the most commonly used data collection method at the preschool and infant-toddler levels (Tables II.1 and II.2).

**Primarily conceptual studies on selection of assessment target.** The limited literature discussing how teachers select assessment targets was primarily conceptual and tended to describe best practices rather than what teachers actually do. Several studies describe best practices when selecting assessment targets, including identifying targets that align with the curriculum, measure critical outcomes of the curriculum, are teachable, are observable or measurable, are generalizable, and are universally designed (Hojnoski and Missall 2007; Good and Kaminski 1996; Good et al. 2001; Fuchs and Deno 1991; Bagnato et al. 2011; Hosp and Ardoin 2008). Bagnato and colleagues (2011) emphasize the importance of targets in early childhood education that are generalizable in that they can be used and observed across multiple settings and promote skill development across related domains. In addition, they emphasize the importance of selecting objectives on which every child can demonstrate progress (for example, “communicates by combining words and ideas” rather than “says [three- to four-word] sentences”) and using tasks or methods that are universally designed to assess the objectives. Such assessment tasks “provide opportunities for all children, despite the extent of their disabilities, to interact with and respond to people and things in the environment by using any response mode that is available to them (for example, gestures, assistive devices) and to have those skills reinforced” (Bagnato et al. 2011).

**Table II.1. Characteristics of Studies and Study Samples Reporting on Data Collection Methods**

	Number of Studies			
	Total	Early Elementary	Preschool	Infant/Toddler
<b>Study design</b>				
Empirical	32	15	11	8
<i>RCT</i>	6	4	0	1
<i>QED</i>	4	2	2	0
<i>SCD</i>	1	1	0	0
<i>Descriptive—Non-Psychometric</i>	12	4	5	4
<i>Descriptive--Psychometric</i>	9	4	4	3
Conceptual	19	13	7	1
Guides (best practices, standards)	6	2	1	4
Literature review	1	1	1	1
<b>Domain<sup>a</sup></b>				
Language/literacy	36	20	14	6
Mathematics	5	3	2	0
Social and emotional	10	5	2	5
<b>Selected characteristics of the target population</b>				
Children with disabilities	31	20	13	3
Children in Head Start or Early Head Start	15	NA	8	7
<b>Total Number of Studies<sup>b</sup></b>	<b>58</b>	<b>31</b>	<b>20</b>	<b>14</b>

Sources: Hosp and Ardoin 2008; Fuchs et al. 1991; Kaminski and Good 1996; Missal et al. 2008; Baggett and Carta 2006; Botts and Notari-Syverson 2007; McConnell and Missall 2008; Spencer et al. 2012; Ball and Gettinger 2009; Conderman and Strobel 2006; Fuchs et al. 2008; Deno et al. 2009; Olinghouse et al. 2006; Oslund et al. 2012; Stecker et al. 2008a; Mellard et al. 2009; Stecker et al. 2008b; Vannest et al. 2011; Vannest et al. 2012; Stecker et al. 2011; Fuchs and Fuchs 2011; Hagens-Murillo 2005; Gettinger and Stoiber 2012; Buzhardt et al. 2011a,b; Greenwood et al. 2010; Greenwood et al. 2011; Jarrett et al. 2006; Vellutino et al. 2006; AlOtaiba et al. 2011; Macy and Bricker 2006; Hollingsworth et al. 2009; Hagan-Burke et al. 2006; Greenwood et al. 2006; Carta et al. 2004; Keilty et al. 2009; DeBrayshe et al. 2009; Buschbacher 2002; McConnell et al. 2002; VanDerHeyden 2005; Cadigan and Missall 2007; VanDerHeyden et al. 2004; Deno 2003; Gettinger and Stoiber 2008; Lo et al. 2009; Livanis and Mouzakitis 2010; Luze and Hughes 2008; Grisham-Brown et al. 2008; Suarez and Daniels 2009; Iovannone et al. 2003; Maheady et al. 2007; Watson et al. 2011; Hagens 2008; Carter and Horner 2007; VanDerHeyden et al. 2008; Pretti-Frontczack et al. forthcoming; Bagnato et al. 2002; Good et al. 2001.

<sup>a</sup> Several studies reported more than one domain, and some studies did not report on domain.

<sup>b</sup> Eight studies targeted more than one age group.

RCT = randomized controlled trial.

QED = quasi-experimental design.

SCD = single case design.

NA = not applicable.

**Table II.2. Commonly Cited Methods of Data Collection**

Method	Number of Studies			
	Total	Early Elementary	Preschool	Infant/ Toddler
Observations	33	12	13	14
Structured tasks	21	13	9	1
Tests	12	10	3	0
<b>Total Number of Studies</b>	<b>58</b>	<b>31</b>	<b>20</b>	<b>15</b>

Sources: See Table II.1.

## **B. Research Recommends Using Multiple Approaches to Documenting and Organizing Information to Support Interpretation**

Once teachers collect ongoing assessment data, the literature suggests that they need systems for documenting the information that facilitate reflection and interpretation (Pretti-Frontczak et al. forthcoming). The systems should be organized in a way that enables teachers to efficiently and easily access the data. When monitoring progress across various domains of development, researchers recommend that teachers use multiple methods. For example, when documenting progress of infants and toddlers, Jarrett and colleagues (2006) recommend that teams rely on multiple documentation strategies, including photographs, anecdotal records, checklists or inventories, questionnaires, notes on conversations, videos, and/or developmental scales. Other types of documentation include children’s work samples (for example, drawings, writing samples, classwork), audio recordings, language samples (transcriptions of child language), and running records of oral reading. In the literature reviewed, checklists and ratings were the most commonly cited methods for documenting information (Tables II.3 and II.4).

The literature refers to systems for organizing information, some created by the assessment developers and others created by the teacher, program, school, or district. Examples of systems for organizing information include portfolios for compiling data from multiple sources; graphs; and Excel spreadsheets, Access databases, or paper-based systems for recording data on children’s progress (see, for example, McConnell et al. 2008; Jarrett et al. 2006; Hojnoski et al. 2009; Gischlar et al. 2009; Lynch 2007; Goertz et al. 2009; Burke and Vannest 2008; Deno et al. 2009; Hagan-Murillo 2005; Ball and Trammell 2011; Greenwood et al. 2011a; Keilty et al. 2009; Phaneuf and Silbergliitt 2003; Venn and McCollum 2002). A portfolio, common at the preschool and infant and toddler level, is a purposeful collection of a child’s products that demonstrates a child’s baseline developmental status and development over time. Portfolios are compilations of various types of documentation, such as anecdotal notes, writing and drawing samples, and videos or photographs (Jarrett et al. 2006; Pretti-Frontczak et al. forthcoming), or samples of children’s work (Meisels et al. 2003). Graphic representation of data can facilitate structured and systematic analysis of data, particularly when tracking progress over time and examining change in targets before and after an intervention (Gischlar et al. 2009).

Prevalent in the literature were studies that discussed web-based or technology-enhanced systems (see, for example, Burke and Vannest 2008; Fuchs and Fuchs 1994; Ysseldyke and Bolt 2007; Sprague et al. 2007; Dickstein et al. 2002). These systems include “off-the-shelf” programs for documenting, organizing, and assisting teachers with instructional planning and individualization. The next section discusses these studies further.<sup>5</sup>

**Table II.3. Characteristics of Studies and Study Samples Reporting on Data Documentation and Organization Methods**

	Number of Studies			
	Total	Early Elementary	Preschool	Infant/Toddler
<b>Study design</b>				
Empirical	39	19	14	9
<i>RCT</i>	10	5	3	2
<i>QED</i>	5	2	3	0
<i>SCD</i>	2	1	0	1
<i>Descriptive—Non-Psychometric</i>	15	7	6	3
<i>Descriptive--Psychometric</i>	7	4	2	3
Conceptual	29	20	11	2
Guides (best practices, standards)				
Literature review	8	2	3	4
<b>Domain<sup>a</sup></b>	1	1	1	1
Language/literacy	44	21	21	9
Mathematics	13	10	3	0
Social and emotional	16	7	5	6
<b>Selected characteristics of the target population</b>				
Children with disabilities	31	19	14	4
Children in Head Start or Early Head Start	21	NA	13	10
<b>Total Number of Studies<sup>b</sup></b>	<b>77</b>	<b>42</b>	<b>29</b>	<b>16</b>

Sources: Good and Kaminski 1996; Fuchs et al. 1991; Buzhardt et al. 2011a; Fuchs et al. 1994; Missall et al. 2008; Baggett and Carta 2006; Buzhardt et al. 2010; Marsh et al. 2006; McConnell and Missall 2008; Spencer et al. 2012; Hamilton et al. 2009; Edelman 2011; Ball and Gettinger 2009; Conderman and Strobel 2006; Fuchs et al. 2008; Landry et al. 2011; Burke and Vannest 2008; Gresham et al. 2010; Deno et al. 2009; Ysseldyke and Bolt 2007; Boden et al. 2012; Fuchs et al. 2007; Oslund et al. 2012; Mellard et al. 2009; Stecker et al. 2008; Roehrig et al. 2008; Vannest et al. 2011; Coffee and Ray-Subramanian 2009; Vannest et al. 2012; Bolt et al. 2010; Stecker et al. 2011; Kashima et al. 2009; Alonzo et al. 2007; Fuchs et al. 2011; Fantuzzo et al. 2011; Yeh 2008; Greenwood et al. 2011; Gettinger and Stoiber 2012; Buzhardt et al. 2011b; Greenwood et al. 2010; Strand and Cerna 2010; Greenwood et al. 2011; Lonigan et al. 2011; Bayat et al. 2010; Buysse and Peisner-Feinberg 2010; Barnett et al. 2007; Jarrett et al. 2006; Landry et al. 2009; AlOtaiba et al. 2011; Hollingsworth et al. 2009; Marcon 2009; Zoll and Rosenquest 2011; Greenwood et al. 2006; Carta et al. 2004; Dickstein et al. 2002; Buschbacher 2002; VanDerHeyden 2005; Deno 2003a; Ortiz et al. 2006; Deno 2003b; Gettinger and Stiober 2008; Lo et al. 2009; Livanis and Mouzakitis 2010; Luze and Hughes 2008; Grisham-Brown et al. 2008; Gischlar et al. 2009; Clarke et al. 2011; Suarez and Daniels 2009; Maheady et al. 2007; Watson et al. 2011; Utley 2009; Venn and McCollum 2002; Carter and Horner 2007; Hojniski and Missall 2007; Pretti-Frontczack et al. forthcoming; Bagnato et al. 2002; Good et al. 2001.

<sup>a</sup> Several studies reported more than one domain, and some studies did not report on domain.

<sup>b</sup> Three studies targeted more than one age group.

RCT = randomized controlled trial.

QED = quasi-experimental design.

SCD = single-case design.

NA = not applicable.

<sup>5</sup> Nearly all of the ongoing assessment tools commonly used in Head Start and Early Head Start programs have available web-based or technology-enhanced systems that support documentation and organization, and some also assist teachers in using the data to individualize instruction. However, the technology enhancements are optional, and it is not clear how widely they are used (see Appendix B; Hulsey et al. 2010; Vogel et al. 2011).

**Table II.4. Commonly Cited Methods of Data Documentation**

Method	Number of Studies			
	Total	Early Elementary	Preschool	Infant/Toddler
Checklists	13	5	7	4
Ratings	10	5	5	3
Rubrics	6	4	2	1
Anecdotal records	4	2	2	1
Portfolios	3	2	2	0
Work samples	3	2	1	0

Sources: See Table II.3.

### C. Teachers Use a Variety of Supports to Interpret and Apply Data to Instruction

Once ongoing assessment data have been collected, documented, and organized, the critical next steps involve interpreting the data and then using the information to individualize instruction. Across the studies in this review, teachers often relied on web-based or technology-enhanced systems, coaches or mentors, or decision points set by schools or districts to help them interpret data (Al Otaiba et al. 2011; Goertz et al. 2009; Wasik et al. 2009; Roehrig et al. 2008). Studies noted that teachers used ongoing assessment data to help them form small groups (Wasik et al. 2009; Roehrig et al. 2008; Marcon 2009; DeBaryshe et al. 2009; Gettinger and Stoiber 2008, 2012); create and implement tiered tasks or lesson plans (Wasik et al. 2009; Marcon 2009; DeBaryshe et al. 2009; Goertz et al. 2009); and identify children in need of one-on-one assistance (Wasik et al. 2009; Marcon 2009; Goertz et al. 2009; Gettinger and Stoiber 2008, 2012). (Table II.5 lists the characteristics of the studies and samples that discussed interpreting and applying data to instruction.)

Several studies looked at the efficacy of web-based or technology-enhanced systems designed to assist teachers in using ongoing assessment data to inform instruction and individualization (Al Otaiba et al. 2011; Bolt et al. 2010; Buzhardt et al. 2010, 2011a; Fuchs et al. 1991; Fuchs and Fuchs 1994; Ysseldyke and Bolt 2007; Landry et al. 2006, 2009, 2011). Studies suggest that children/students whose teachers or home visitors had access to a web- or computer-based system that provided immediate feedback with instructional recommendations had higher levels of achievement than children/students whose teachers or home visitors did not have access to an immediate form of feedback with instructional recommendations (Al Otaiba et al. 2011; Buzhardt et al. 2011a; Ysseldyke and Bolt 2007; Landry et al. 2009).

**Table II.5. Characteristics of Studies and Study Samples Reporting on the Interpretation and Application of Data to Instruction**

	Number of Studies			
	Total	Early Elementary	Preschool	Infant/Toddler
<b>Study design</b>				
Empirical	15	6	8	1
<i>RCT</i>	7	4	2	1
<i>QED</i>	2	0	2	0
<i>Descriptive—Non-Psychometric</i>	6	2	4	0
Conceptual	3	1	2	2
<b>Domain<sup>a</sup></b>				
Language/literacy	11	3	10	3
Mathematics	8	4	2	3
Social and emotional	3	0	1	3
<b>Selected characteristics of the target population</b>				
Children with disabilities	4	1	3	2
Children in Head Start or Early Head Start	8	NA	7	1
<b>Total Number of Studies<sup>b</sup></b>	<b>18</b>	<b>7</b>	<b>10</b>	<b>3</b>

Sources: Al Otaiba et al. 2011; Goertz et al. 2009; Wasik et al. 2009; Roehrig et al. 2008; Marcon 2009; DeBaryshe et al. 2009; Gettinger and Stoiber 2008, 2012; Macy and Bricker 2006; Bolt et al. 2010; Buzhardt et al. 2010, 2011a; Fuchs et al. 1991; Fuchs and Fuchs 1994; Ysseldyke and Bolt 2007; Landry et al. 2006, 2009, 2011.

<sup>a</sup> Several studies reported more than one domain, and some studies did not report on domain.

<sup>b</sup> Two studies targeted more than one age group.

RCT = randomized controlled trial.

QED = quasi-experimental design.

NA = not applicable.

Despite these promising findings, Bolt and colleagues emphasize the important role of implementation integrity—teachers using the technology in the intended way—in achieving these results (Ysseldyke and Bolt 2007; Bolt et al. 2010). In a random assignment study of the effects of a technology-enhanced continuous ongoing assessment and instructional management system—Accelerated Math—on math instruction in elementary schools, the authors examined variability in how teachers implemented the program (Ysseldyke and Bolt 2007). Notably, they found that teachers in the treatment group implemented Accelerated Math with only about 40 percent of students, despite a recommendation to implement the program with all students in their classes. Furthermore, the degree of implementation varied across students, with some students receiving the expected dosage (“high implementers”) and others receiving lower levels of dosage (“low implementers”). Authors found no systematic differences in the characteristics of the students in each group (“high” and “low” implementers, plus students who did not receive the intervention); they did find, however, that intervention integrity had a significant effect on gains in math scores. A follow-up study showed significant variability in implementation across students, teachers, and schools, suggesting that each may affect the extent of implementation. The study did not explore the correlations between specific student-, teacher-, or school-level factors and implementation but recommended them for future research (including the level of support offered by administrators, such as time for training and planning; teachers’ beliefs and knowledge of the system and the content area; and student initiative). They also found that teachers appeared to be stable in their implementation of the program across years and that the teachers who more successfully implemented ongoing assessment were in general more effective teachers (Bolt et al. 2010).

## D. Families May Be Important Partners in the Collection and Interpretation of Ongoing Assessment Data

Although we lack clear recommendations from recent empirical work on the role of families in ongoing assessment for individualization, families are acknowledged as a key partner in assessing, promoting, and tracking the development of young children. Family involvement has long been a requirement under the Head Start Program Performance Standards and Individuals with Disabilities Education Act (IDEA). Standards for early childhood education programs developed by national accreditation organizations, such as the National Association for the Education of Young Children, and many state child care quality rating and improvement systems also include guidelines for partnering with families. In the area of ongoing assessment, families can contribute to ongoing assessments of children, selection of learning activities and strategies, reinforcement of interventions and activities implemented at the school or program in the home, and implementation of interventions and activities at home (particularly in home visiting programs). Of the studies in this review, 15 discussed approaches to engaging families in ongoing assessment (Pretti-Frontczak et al. forthcoming; Jarrett et al. 2006; Campbell 2011; Dickstein et al. 2002; Boden et al. 2012; Vannest et al. 2011; MacDonald 2007; Buldu 2010; Keilty et al. 2009; Suárez and Daniels 2009; Moes and Frea 2002; Xu 2011; Gischlar et al. 2009; Hollingsworth et al. 2009; Iovannone et al. 2003; Table II.6).

In describing best practices for using data to inform decision-making and instruction, studies described the importance of involving families in the collection and interpretation of data (Gischlar et al. 2009; Pretti-Frontczak et al. forthcoming; Jarrett et al. 2006). Three studies presented tools or frameworks that can be used for collecting information from families on children's development and progress toward child and family goals (Campbell 2011; Dickstein et al. 2002; Jarrett et al. 2006). These systems were used in relation to developing and tracking IFSPs or family service plans in Early Head Start.<sup>6</sup>

Other studies described ways ongoing assessment systems were used to provide families with regular feedback on children's progress. For example, two studies described Daily Behavior Report Cards (daily reports for parents) used for monitoring the behavior of students with Individualized Education Programs (Boden et al. 2012; Vannest et al. 2011). Other studies described how documentation of children's behavior and work can be shared with parents of early elementary school children to help them gain a better understanding of children's progress (MacDonald 2007; Buldu 2010).<sup>7</sup> The findings of our review confirm those of a compendium of eight assessments for children ages 3 to 5 that were reviewed for OPRE. Of those assessments, few provided guidance or tools for incorporating family input about children's skills and development into ongoing assessment, though most did recommend ways to share children's assessment results with their families (Halle et al. 2011).

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<sup>6</sup> EHS participants with and without disabilities have family service plans; only children eligible under IDEA (identified as having or being at risk of having disabilities) have IFSPs.

<sup>7</sup> MacDonald 2007 and Buldu 2010 referred to this documentation as pedagogical documentation. MacDonald (2007) defined pedagogical documentation as "a visible trace that captures what children did and said during interactions"; the content may include "concrete artifacts, such as audio and video recordings, photographs, and examples of children's work." The content is designed to be "re-visited" and "interpreted" by children, teachers, and parents in a "rigorous, methodical, and democratic way."

**Table II.6. Characteristics of Studies and Study Samples Reporting on Engaging Families in Ongoing Assessment**

	Number of Studies			
	Total	Early Elementary	Preschool	Infant/Toddler
<b>Study design</b>				
Empirical	7	3	1	3
<i>Descriptive</i>	5	3	1	1
<i>SCD</i>	2	0	0	2
Guides (best practices/standards)	5	1	3	3
Conceptual	3	2	1	0
<b>Domain<sup>a</sup></b>				
Language/literacy	3	2	1	0
Mathematics	0	0	0	0
Social and emotional	7	4	1	2
<b>Selected characteristics of the target population</b>				
Children with disabilities	6	4	2	0
Children in Head Start or Early Head Start	2	NA	0	2
<b>Total Number of Studies<sup>b</sup></b>	<b>15</b>	<b>6</b>	<b>5</b>	<b>6</b>

Sources: Pretti-Frontczak et al. forthcoming; Jarrett et al. 2006; Campbell 2011; Dickstein et al. 2002; Boden et al. 2012; Vannest et al. 2011; MacDonald 2007; Buldu 2010; Keilty et al. 2009; Suárez and Daniels 2009; Moes and Frea 2002; Xu 2011; Gischlar et al. 2009; Hollingsworth et al. 2009; Iovannone et al. 2003.

<sup>a</sup>Four studies did not report domain.

<sup>b</sup>Two studies targeted more than one age group.

SCD = single-case design.

NA = not applicable.

Studies also discussed ways of involving families in setting goals for children (Keilty et al. 2009; Suárez and Daniels 2009). One study described an intervention that included individualizing behavioral support plans designed to facilitate family use of functional communication training within important family routines (Moes and Frea 2002). Another study, using a single-subject multiple baseline design, examined the effects of teaching primary caregivers to conduct formative assessment procedures on the development of social interactions between themselves and their infants who were born prematurely and had low birth weight (Xu 2011). The study found that teaching caregivers to conduct formative assessment with regular support from professionals had a positive impact on caregiver-child social interactions and the child's communication skills and overall development.

## **E. Teachers May Need Support to Overcome Barriers to Using Ongoing Assessment for Individualization**

Although we lack clear recommendations from recent empirical work on critical aspects of implementation, best practice guidelines suggest that teachers' knowledge and beliefs may be critical to the successful implementation of ongoing assessment, as is the availability of supports for teachers' use of assessment information (Roehrig et al. 2008; Keilty et al. 2009; Orosco and Klingner 2010). It is recommended that teachers have knowledge of child development, assessment, and instructional practice to collect data on a child's performance, identify the types of instructional adaptations that are needed, implement those adaptations, and then continue to monitor progress to determine whether the instructional change has resulted in improvements in the child's performance. In addition to teachers' knowledge, the literature suggests that teachers' beliefs about

assessment and their access to ongoing supports and resources may be important factors that influence implementation.

Studies included in this review that examined teachers' use of ongoing assessment suggest the following:

- Teachers may recognize the value of ongoing assessment, but they do not consistently collect ongoing assessment data nor do they use it for instruction and individualization.
- Barriers to using data include lack of pedagogical content knowledge and knowledge of assessment and interpretation of data.
- Teachers report wanting more training and professional development on using ongoing assessment to individualize instruction, but limited research exists to inform the approaches to training with the greatest promise for supporting teachers.

In the remainder of this section, we discuss each of these findings in more detail.

### **1. Teachers Recognize Value of Ongoing Assessment but Do Not Consistently Collect or Use Ongoing Assessment Data**

Across the nine studies that reported on teachers' perceptions of, experiences with, or knowledge of ongoing assessment and using data to inform instruction, findings suggest that although practitioners may recognize the value of ongoing assessment, they do not consistently collect ongoing assessment data nor do they use it for instruction and individualization. Six of the studies focused on the early elementary level; two studies focused on the preschool level, including one study of Head Start teachers; and one study focused on the infant and toddler level (Carlson et al. 2011; Roehrig et al. 2008; Luckner and Bowen 2010; McClain et al. 2012; Kashima et al. 2009; Keilty et al. 2009; Orosco and Klingner 2010; Venn and McCollum 2002; Goertz et al. 2009; see Table II.7).

One study reported that, during focus groups with early interventionists from seven agencies, participants described valuing authentic assessment methods as a means of obtaining more relevant, functional, and sensitive information about a child's capabilities than available through "decontextualized, standardized instruments" and were comfortable using authentic assessment methods (Keilty et al. 2009). Another study found that among three Head Start agencies, teachers from only one program reported conducting assessments to inform instruction and individualization (Venn and McCollum 2002). Rather, for both long- and short-term planning, teachers relied on three main sources: (1) personal files that included past lesson plans, (2) curricular and activity resource books, and (3) ideas from other people (such as other teachers who had worked at the agency for a long time). The study found that even teachers who did conduct assessments did not use the resulting data to make instructional decisions, and teachers did not individualize their plans for specific children but instead planned for the group. Teachers reported few differences in the process or resources used when planning specifically for children with disabilities; teachers did not use the children's Individualized Education Plans (IEPs) or individualized assessments as sources of information, nor did they consult with disability coordinators. A third study, designed to assess RTI implementation in an urban elementary school, reported misalignment of assessment and instructional practices; assessment and instructional practices that were not appropriate for meeting the needs of English language learners; and teachers who had limited knowledge of and skill in the use of data to assess students' progress and modify evidence-based reading practices (Orosco and Klingner 2010). Only one study (Goertz et al. 2009) empirically examined whether teachers' thinking

and knowledge affected their actions when implementing ongoing assessment for individualization; the study failed to find a relationship between teachers' mathematical knowledge for teaching and their ability to respond to students' misconceptions.

**Table II.7. Characteristics of Studies and Study Samples Reporting on Teachers' Perceptions and Knowledge of Ongoing Assessment and Using Data to Inform Instruction**

	Number of Studies			
	Total	Early Elementary	Preschool	Infant/Toddler
<b>Study design</b>				
Empirical	9	6	2	1
<i>Descriptive</i>	8	5	2	1
<i>QED</i>	1	1	0	0
<b>Domain<sup>a</sup></b>				
Language/literacy	4	4	0	0
Mathematics	3	3	0	0
Science	1	1	0	0
<b>Selected characteristics of the target population</b>				
Children with disabilities	5	2	2	1
Children in Head Start or Early Head Start	1	NA	1	0
<b>Total Number of Studies<sup>b</sup></b>	<b>9</b>	<b>6</b>	<b>2</b>	<b>1</b>

Sources: Carlson et al. 2011; Roehrig et al. 2008; Luckner and Bowen 2010; McClain et al. 2012; Kashima et al. 2009; Keilty et al. 2009; Orosco and Klingner 2010; Venn and McCollum 2002; Goertz et al. 2009.

<sup>a</sup> Four studies did not report domain. Two studies reported on more than one domain.

QED = quasi-experimental design.

NA = not applicable.

## 2. Lack of Knowledge May Limit Teachers' Use of Ongoing Assessment Data to Inform Instruction; Teachers Desire Additional Training and Support

The literature pointed to two main barriers to using assessment data to inform instruction: (1) teachers' knowledge of and skill in using assessment results to individualize instruction and (2) the "breadth and depth" of teachers' knowledge of child development and the content area (Roehrig et al. 2008; Keilty et al. 2009; Orosco and Klingner 2010). For example, through interviews with 10 kindergarten and 1st-grade teachers and four reading coaches working at four Florida Reading First schools, one study found that three main obstacles teachers reported facing when attempting to use assessment data to inform instruction were (1) coaching availability and the quality of support received, (2) a disconnect between receiving assessment results and knowing how to adjust instructional practices, and (3) teachers' knowledge of reading instruction. In another study, early interventionists reported that successful implementation of ongoing assessment to individualize services for children requires a thorough understanding of infant and toddler development, as well as how to conduct observations and interviews to gather data (Keilty et al. 2009).

Across studies that asked teachers about their experiences using ongoing assessment to inform instruction, teachers consistently cited the need for additional training and support. For example, Roehrig et al. (2008) reported that teachers were satisfied with the professional development they received on a new reading curriculum but wanted more training on how to "link what they learned about students from the data to using the reading program materials in an individualized fashion." In a statewide survey of Indiana educators administered by the Center for Evaluation and Education

Policy (CEEP), respondents answered questions about the training and support they received to assist them in adopting or implementing the RTI framework (Kashima et al. 2009). Of the 710 respondents who identified their district or school as in the process of adopting or implementing the RTI framework, less than half of respondents reported that they have received professional development focused on changing the curriculum and instruction to focus on evidence-based practices. Only one-third of the respondents agreed that their professional development activities have provided sufficient support to administer universal screening and progress monitoring assessments. Lastly, about one-quarter of respondents stated that professional development activities provided sufficient training for data analysis and data-driven decision-making.

### **3. Limited Research on the Effectiveness of Teacher Supports for the Use of Ongoing Assessment to Individualize Instruction**

Despite the need for additional training and support, only 18 of the 173 studies reviewed described the training and support provided to teachers implementing ongoing assessment. Fewer studies examined which approaches to supporting teachers held the most promise for improving their ability to use ongoing assessment for individualization (Landry et al. 2006, 2009, 2011; Wasik et al. 2009; Fuchs et al. 1991; Buzhardt et al. 2010, 2011a, 2011b, 2012; Al Otaiba 2005; Greenwood et al. 2011a; Gettinger and Stoiber 2008, 2012; Ball and Trammell 2011; Gajus and Barnett 2012; Marcon 2009; Zoll and Rosenquest 2011; Grisham-Brown et al. 2008; Bagnato et al. 2002; Table II.8).

Of the studies that described the types of assistance offered to teachers to support their use of ongoing assessment and using data to inform instruction, most offered initial trainings, which ranged from online professional development opportunities to multiday workshops, followed by ongoing one-on-one support from mentors or coaches (Wasik et al. 2009; Gettinger and Stoiber 2008, 2012; Zoll and Rosenquest 2011; Grisham-Brown et al. 2008). For example, Head Start teachers implementing a curriculum-based vocabulary ongoing assessment tool received group training on a topic (Wasik et al. 2009). Trainers then modeled strategies for each topic in the teachers' classrooms. The teachers practiced the strategies for as many as two weeks and were then observed and given feedback on their implementation of these strategies in their classrooms.

**Table II.8. Characteristics of Studies and Study Samples Reporting on Training Offered to Teachers Support Their Use of Ongoing Assessment and Using Data to Individualize Instruction**

	Number of Studies			
	Total	Early Elementary	Preschool	Infant/Toddler
<b>Study design</b>				
Empirical	14	1	10	3
<i>Descriptive</i>	6	0	6	1
<i>RCT</i>	5	1	2	2
<i>QED</i>	3	0	3	0
Conceptual	4	0	3	4
Literature Review	1	0	1	0
<b>Domain<sup>a</sup></b>				
Language/literacy	15	0	12	4
Mathematics	3	1	3	4
Social and emotional	3	0	3	4
<b>Selected characteristics of the target population</b>				
Children with disabilities	5	1	4	2
Children in Head Start or Early Head Start	12	NA	10	3
<b>Total Number of Studies<sup>b</sup></b>	<b>19</b>	<b>1</b>	<b>14</b>	<b>6</b>

Sources: Landry et al. 2006, 2009, 2011; Wasik et al. 2009; Fuchs et al. 1991; Buzhardt et al. 2010, 2011a, 2011b, 2012; Al Otaiba 2005; Greenwood et al. 2011a; Gettinger and Stoiber 2008, 2012; Ball and Trammell 2011; Gajus and Barnett 2012; Marcon 2009; Zoll and Rosenquest 2011; Grisham-Brown et al. 2008; Bagnato et al. 2002.

<sup>a</sup> One study did not report domain. Four studies reported on more than one domain.

<sup>b</sup> Three studies included more than one age group.

RCT = randomized controlled trial.

QED = quasi-experimental design.

NA = not applicable.

Research on the types of professional development that may support teachers in their use of ongoing assessment for individualization is limited and findings are not consistent (Buzhardt et al. 2011a; Landry et al. 2009, 2011). For example, one study examined the role of various professional development methods on teaching behavior and children's school-readiness (Landry et al. 2009). The random-assignment study assigned teachers to one of five experimental conditions: a business-as-usual control group or one of four treatment groups receiving a mix of a regular in-classroom mentoring and/or immediate, detailed feedback about progress monitoring data. Group 1 received immediate, detailed feedback (provided via a personal digital assistant [PDA] and including tailored recommendations for instructional activities and child groupings); Group 2 received immediate, detailed PDA feedback without mentoring; Group 3 received limited feedback (provided via paper-and-pencil assessment results paired with a reference manual of instructional strategies) with mentoring; and Group 4 received limited feedback without mentoring. All four treatment groups received online professional development. The study found that teachers in Group 1—who received online professional development coupled with both immediate, detailed feedback and mentoring—showed the greatest improvements in their teaching behavior and in their children's school-readiness. Across the experimental conditions, stronger and more consistent evidence was found for the efficacy of detailed, immediate feedback compared with classroom mentoring; the effects of mentoring in this study were mixed. For example, mentoring was found to be important for increasing teachers' quality of phonological awareness and writing instruction, but having a mentor did not increase teachers' book reading or print knowledge instructional practices.

## **F. Strengths and Limitations of the Literature**

In this chapter, we described the current research on the key activities involved in implementing ongoing assessment that we theorize should be included in a measure that assesses whether and how teachers use ongoing child assessment for individualization of instruction. As discussed above, we lack rigorous research on selecting an assessment method and target. The literature largely describes perceived best practices related to those activities. The studies indicate that teachers use multiple approaches to documenting and organizing information to support interpretation. The available research suggests that (1) teachers may rely on a variety of supports to interpret and apply data to instruction; (2) although teachers value the use of ongoing assessment, they do not consistently collect ongoing assessment data or use it for instruction and individualization; (3) barriers to using data include lack of pedagogical content knowledge and knowledge of assessment and interpretation of data; and (4) teachers want more training and professional development on using ongoing assessment to individualize instruction.

Overall, there is a paucity of solid research on the activities critical to teachers' use of ongoing child assessment for individualization of instruction. The literature does not provide guidance on what we should look for to determine whether these activities are being implemented well, nor does it describe the factors that influence teachers' abilities to implement the activities well. The literature does, however, give us an understanding of the perceived best practices around the implementation of these activities, as well as the range of activities we are likely to see in early childhood settings. Given the lack of rigorous research on these activities, we had to rely on perceived best practices, professional guidelines, and recommendations from expert consultants to identify the key activities to be included in the T3.

Because recommendations from professional standards and Head Start requirements emphasize partnering with families to implement ongoing assessment, we also reviewed the literature on parent engagement in ongoing assessment and teachers' experiences using ongoing child assessment to individualize instruction. Although limited research exists on parent engagement, we were able to glean information about the purposes of involving parents, as well as the types of strategies that programs commonly use to engage them.

## CHAPTER III. ASSESSING THE IMPLEMENTATION OF ONGOING CHILD ASSESSMENT (PARTICULARLY TO INDIVIDUALIZE INSTRUCTION)

### Key Findings

- ***We lack a solid literature base on how to measure teachers' use of ongoing child assessment.***
  - Of the 173 studies reviewed, 21 included a measure of teacher implementation of ongoing assessment, and only some provided detailed information about the measures used to assess implementation.
  - More than half of the 21 studies that assessed the implementation of ongoing assessment were conducted at the early elementary level.
  - The literature provides some examples of measures that assess how well teachers implement ongoing assessment tools and whether teachers make instructional modifications in response to ongoing assessment data. However, the literature provides very few examples of measures that assess two important areas: (1) how teachers make instructional decisions based on ongoing assessment data and (2) the knowledge and skills necessary for teachers to successfully implement ongoing assessment for individualization, especially with infants, toddlers, and preschoolers and in home visiting settings.
- ***Across all dimensions of implementation, we lack evidence linking assessments of teacher implementation of ongoing assessment to child outcomes.***
  - In this review, we identified only three studies that examined this question. Two studies found statistically significant correlations between a measure of teacher fidelity to ongoing assessment procedures and residualized gains in student scores on a standardized test.
  - Another study found that changes in teaching behavior—including administering additional academic assessments to students—predicted higher student academic outcomes.
- ***The one study that used measures to examine the relation between teachers' knowledge and their implementation of ongoing assessment for individualization did not find a significant relationship.***

The previous chapter discussed findings from the literature review that help us identify the key constructs to be addressed by a measure of teachers' use of ongoing assessment for individualization. In this chapter, we present examples from the literature of approaches to assessing teachers' use of ongoing assessment for individualization; these findings informed our measurement plan. We first describe studies that assessed how teachers use ongoing child assessment and then provide an overview of the measures used to do so. Where studies provided detail on assessment items or protocols, we summarize specific approaches. These details were most instructive in informing our measurement plan. We conclude by discussing the strengths and limitations of the literature.

## A. Overview of the Studies That Measure the Implementation of Ongoing Assessment

Of the 173 studies reviewed, 21 included a measure of the implementation of ongoing assessment, addressing a range of domains, settings, and age groups (see Table III.1). Of these studies, 12 measured the implementation of ongoing assessment at the early elementary level (kindergarten to 3rd grade), eight at the preschool level, and two at the infant and toddler level. Only one study measured the implementation of ongoing assessment in a home visiting setting (Greenwood et al. 2011a). Across settings, nearly all studies examined child progress in the domains of language and literacy or mathematics; two studies conducted at the early elementary and infant and toddler levels focused on social and emotional or behavioral skills; and one study conducted at the infant and toddler level targeted cross-domain outcomes. Eight studies included children enrolled in Head Start or Early Head Start, and eight studies included children with disabilities.

**Table III.1. Characteristics of Studies and Study Samples Reporting on Assessment of Implementation of Ongoing Assessment**

	Number of Studies			
	Total	Early Elementary	Preschool	Infant/Toddler
<b>Study design</b>				
Empirical	20	12	8	1
<i>Descriptive—Non-Psychometric</i>	9	5	4	1
<i>Experimental</i>	6	4	2	0
<i>QED</i>	3	2	1	0
<i>Descriptive—Psychometric</i>	1	0	1	0
<i>SCD</i>	1	1	0	0
Guides (best practices/standards)	1	0	0	1
<b>Domain<sup>a</sup></b>				
Language/literacy	12	5	5	2
Mathematics	7	4	3	1
Social and emotional	2	1	0	1
Not specified	3	2	2	0
<b>Selected characteristics of the target population<sup>b</sup></b>				
Children with disabilities	8	4	5	0
Children in Head Start or Early Head Start	8	NA	6	2
<b>Total Number of Studies<sup>b</sup></b>	<b>21</b>	<b>12</b>	<b>8</b>	<b>2</b>

Sources: Greenwood et al. 2011a; Landry et al. 2009, 2011; Bolt et al. 2010; Luckner and Bowen 2010; Strand and Cerna 2010; Ball and Gettinger 2009; DeBaryshe et al. 2009; Goertz et al. 2009; Lo et al. 2009; Grisham-Brown et al. 2008; Hagans 2008; Luze and Hughes 2008; Roehrig et al. 2008; VanDerHeyden et al. 2004, 2008; Carter and Horner 2007; MacDonald 2007; Maheady et al. 2007; Ysseldyke and Bolt 2007; Fuchs et al. 1991.

<sup>a</sup>Some studies report on more than one subcategory.

<sup>b</sup>One study targets more than one age group.

QED = quasi-experimental design.

SCD = single-case design.

NA = not applicable.

Information about how other studies assessed teachers' implementation of ongoing assessment can inform our measurement plan. Typically, the nine studies for which assessing implementation of ongoing child assessment was the primary objective provided greater detail about their implementation measures (Greenwood et al. 2011a; Bolt et al. 2010; Luckner and Bowen 2010; Goertz et al. 2009; Grisham-Brown et al. 2008; Luze and Hughes 2008; Roehrig et al. 2008;

MacDonald 2007; Maheady et al. 2007); studies that assessed implementation as part of a broader study provided less detailed information about their implementation measures (Landry et al. 2009, 2011; Ball and Gettinger 2009; DeBaryshe et al. 2009; Lo et al. 2009; Hagans 2008; VanDerHeyden et al. 2004, 2008; Carter and Horner 2007; Ysseldyke and Bolt 2007; Fuchs et al. 1991). Examples of studies that provided detailed information include two studies focused on variation in implementation of ongoing assessment (one at the early elementary level and one at the infant and toddler level), including sources of variation in implementation and/or differential effects of variation in implementation on student outcomes (Greenwood et al. 2011a; Bolt et al. 2010). Another study assessed the use of interim assessments to improve elementary mathematics instruction, including how teachers learned from assessment results and in turn made instructional decisions and individualized instruction, and how teacher capacity related to the use of assessment information to inform teaching practice (Goertz et al. 2009).

## B. Specific Measures of Implementation Identified in the Literature

Given the complexity of understanding teachers' use of ongoing assessment, we grouped approaches to assessing implementation into three categories. The first category, "what teachers do," includes measures of how teachers collect and interpret data on child progress and how they individualize instruction accordingly. The second category, "what teachers think," includes measures of how teachers make instructional decisions based on ongoing assessment data. The third category, "what teachers know," includes measures of the knowledge necessary for teachers to successfully implement ongoing assessment in terms of pedagogical content knowledge and general knowledge of assessment and instruction. We theorized that a measure of teachers' use of ongoing child assessment for individualization should capture all three factors, because the interplay between them provides the context for interpreting any issues in implementation—that is, whether the issue is one of practice, the capacity to reflect, or knowledge—and may enable users to recommend targeted professional development.

### 1. Measures of What Teachers Do

The majority of research in this area concentrated on documenting how teachers implement ongoing assessment. Nearly all of the studies (19 of 21) measured whether and how teachers implemented ongoing assessments and/or used ongoing assessment data for individualization. Most of these studies measured whether the individuals conducting the assessments were able to appropriately administer and score the tool, though there was extensive variation on what was being assessed and how.

**Measures of fidelity.** About half of the studies assessing "what teachers do" measured fidelity of implementation to an assessment system, including six at the early elementary level, three at the preschool level, and one at the infant and toddler level (Greenwood et al. 2011a; Bolt et al. 2010; DeBaryshe et al. 2009; Landry et al. 2009; Grisham-Brown et al. 2008; Carter and Horner 2007; Ysseldyke and Bolt 2007; Fuchs et al. 1991; Hagans 2008; VanDerHeyden et al. 2008). Across these studies, there was variation in the type of fidelity addressed, though most measured fidelity to a standardized assessment tool or to a computer or web-based system. For example, a few studies measured teachers' fidelity to recommendations for instructional techniques suggested by a computer- or web-based system (Bolt et al. 2010; Ysseldyke and Bolt 2007; Fuchs et al. 1991), and two studies measured fidelity to documentation procedures for a standardized ongoing assessment (Grisham-Brown et al. 2008; Fuchs et al. 1991). Another study used a standardized tool, the Modified Accuracy of Implementation Scale-Revised, to examine teachers' fidelity to ongoing assessment documentation and interpretation procedures (Fuchs et al. 1991), and one study gauged

whether teachers appropriately selected an assessment target according to a standardized ongoing assessment tool (Grisham-Brown et al. 2008).

Although three of these studies assessed fidelity by coding data from a computer- or web-based system (Bolt et al. 2010; Ysseldyke and Bolt 2007; Fuchs et al. 1991), most used live or video-recorded observations, with expert observers frequently using a checklist or protocol to rate the observation. Checklists and protocols were idiosyncratic, often gauging whether teachers implemented each step in the administration procedure of a particular ongoing assessment tool. These studies typically did not provide extensive detail about their measurement protocols.

**Measures of reliability.** Six studies measured assessor reliability when scoring children using a standardized ongoing assessment tool. Of the six studies that included assessment of reliability, two were at the early elementary level, two at the preschool level, and two at the infant and toddler level (Greenwood et al. 2011a; Lo et al. 2009; Luze and Hughes 2008; Fuchs et al. 1991; VanDerHeyden et al. 2004, 2008). No studies attempted to measure assessor reliability to a curriculum-embedded assessment; to do so, a study would need to assess reliability in terms of whether teachers' documentation of a specified task was complete and objective, and could therefore inform reliable inferences.

**Measures of instructional modifications.** Six studies assessed how teachers modified and/or individualized instruction in response to ongoing assessment data, including three at the early elementary level, two at the preschool level, and one spanning both the early elementary and preschool levels (Strand and Cerna 2010; Goertz et al. 2009; Landry et al. 2009; Roehrig et al. 2008; Maheady et al. 2007; Fuchs et al. 1991). Across these studies, approaches to assessment ranged from simple frequency counts of specific instructional activities, to detailed measures of each aspect of a specific ongoing assessment tool, to broader assessments providing a more global picture of teachers' use of assessment data to inform instruction.

Strand and Cerna (2010) provide an example of a simple frequency count of an instructional activity. The study examined the effects of the Repeated Assessment Focused Teaching (RAFT) framework for managing teachers' access to data (in terms of both data type and frequency). Staff who frequently observed teachers and attended meetings at which teachers discussed the use of data were asked to complete a checklist regarding activities that teachers implemented in response to RAFT. The checklist included questions about whether teachers had administered additional academic assessments or academic skills exercises to students. Checklist response options included "yes," "no," and "don't know."

Fuchs et al. (1991) illustrate a more comprehensive approach that employed the Math-Modified Accuracy of Implementation Rating Scale-Revised at the elementary level. The scale contains three subscales assessing the implementation of a curriculum-based measure with technology support: (1) structure (estimating initial performance level, graphing scores, writing goals, drawing goal lines); (2) measurement (test administration, reliability of scoring); and (3) evaluation (describing instructional procedures, timing instructional adjustments). The same study also used log files from a computerized expert system to calculate the number of interactions between teachers and the expert system and compare the recommendations made by the expert system regarding instructional adjustments for individual students with strategies selected by teachers as recorded on their Instructional Plan Sheets. Teachers used Instructional Plan Sheets to describe each teaching adjustment for individual students across six categories: (1) date, (2) instructional procedure, (3) arrangement, (4) time, (5) materials, and (6) motivational strategies. In addition, the study examined the number and nature of teachers' instructional adjustments using a post-treatment questionnaire

and teachers' Instructional Plan Sheets. The comprehensive nature of this approach captured both the number and nature of instructional modifications based on ongoing assessment data.

Goertz et al. (2009) depict a broader assessment, providing a more global picture of teachers' use of assessment data to inform instruction. Specifically, the study used classroom observations and teacher interviews to examine how elementary school teachers used the results of interim and other formative assessments in mathematics to inform their instruction. Classroom observations focused on teachers' use of formative assessment and instructional practices, such as "opportunities for peer (or self) assessment, re-teaching of content, pull-out remediation, or calling on individual students." Teacher interviews included semi-structured questions that provided context for the observed lessons and sought to understand the ways teachers monitored students' mathematical understanding, thus also providing information about the next area, "what teachers think."

## 2. Measures of What Teachers Think

Of the five studies that measured how teachers made instructional decisions based on ongoing assessment data—four at the early elementary level and one at both the early elementary and preschool levels—all but one used teacher surveys or interviews to gather this information (albeit with quite different protocols and approaches). The remaining study asked teachers for written feedback following a specific protocol. Although some studies solicited general information from teachers about how ongoing assessment data shaped instruction, others probed more deeply into the ways that ongoing assessment data drove instructional decision-making.

The two studies that solicited general information from teachers about how ongoing assessment data shaped instruction both used teacher surveys and interviews. Specifically, one study surveyed elementary school teachers to collect information on whether student performance on the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) affected the teachers' instruction or classroom environment and whether they use DIBELS data to make instructional changes (Ball and Gettinger 2009). The other study used a semi-structured 14-item interview to examine elementary school teachers' perceptions of the use and value of ongoing assessment for students who are deaf or hard of hearing (Luckner and Bowen 2010).

Three studies probed more deeply into the ways that ongoing assessment data drove instructional decision-making, either through the use of multiple measures or through in-depth verbal or written protocols. One study used a series of teacher interviews to examine how elementary school teachers used the results of interim and other formative assessments to inform their mathematics instruction and individualize instruction for specific students (Goertz et al. 2009). The fall teacher interviews included a Data Analysis Scenario, during which researchers presented each teacher with a one-page printout of hypothetical interim assessment results, asking the teacher "to imagine that this was her class and to 'think aloud' ... about what she saw in the results. After approximately five minutes, or after the teacher stopped talking, [researchers] continued with a series of six follow-up questions designed to call attention to patterns in the data ([for example], Are there any topics that this class, overall, appears to have difficulty with? How do you know?). In this way, [researchers] were able to capture both each teacher's initial, natural reaction to the assessment results as well as whether or not, with probing, she noticed particular strengths and weaknesses among her class." The second study used semi-structured teacher interviews that asked elementary school teachers "to expand as much as possible on their experiences with assessment data so as to obtain a clear picture of their use of assessment data and how it influenced their instructional decision making" (Roehrig et al. 2008). The interviews used 28 open-ended questions, including inquiries about teachers' use of both assessment data and the Progress Monitoring and Reporting

Network (PMRN), as well as the barriers experienced and supports received when using data to drive instruction. The third study required teaching candidates to submit a written report about their experiences during an 8- to 10-week field teaching placement in a preschool, primary, or secondary school setting. The teaching candidates' reports followed a protocol that solicited data on five areas: (1) students and the educational context, (2) instructional goals and objectives, (3) assessment and instructional plans, (4) professional reflections and data analysis, and (5) intended professional responses (Maheady et al. 2007). These three studies, with their useful examples of how to measure the specific ways that ongoing assessment data drives instructional decision-making, were instructive in informing our measurement plan.

### 3. Measures of What Teachers Know

Only two studies—both focused on students in early elementary grades—measured the knowledge necessary for teachers to successfully implement ongoing assessment (including both pedagogical content knowledge and knowledge of assessment and instruction). The first study focused deeply and narrowly on a subject-specific pedagogical knowledge for teaching. Specifically, researchers used a survey to measure elementary school teachers' mathematical knowledge for teaching and examine the relationship between mathematical content knowledge and the ways teachers used information from interim assessments in mathematics (Goertz et al. 2009). The survey used nine multiple-choice items on numbers and operations from the Content Knowledge for Teaching-Math (CKT-M) instrument (Hill et al. 2004). By contrast, the second study more broadly examined teachers' instructional knowledge and skill using an ongoing assessment tool. Researchers asked coaches to rate elementary school teachers' skills as above average, average, or below average in affecting student outcomes, in teacher knowledge, and in using the PMRN database (Roehrig et al. 2008). The study also used semi-structured interviews with open-ended questions that ask teachers to discuss their experiences with teacher training in reading and their knowledge of reading instruction and the reading program they were implementing.

## C. Strengths and Limitations of the Literature

Although current studies provide some valuable information on how to assess teachers' use of ongoing assessment for individualization, we lack a solid literature base. We identified only 21 studies that assessed implementation of ongoing assessment. Several of these studies provided minimal detail about the measures they used, limiting their usefulness to this project. Beyond that, the literature is limited in the degree to which it addresses different settings, target populations, and outcome domains. Specifically, the literature is limited by the especially small number of studies available on infants and toddlers, as well as by the lack of studies focused on a home visiting setting or on a domain other than literacy and language or mathematics. For our purposes, strengths of the literature include the availability of some studies in Head Start and Early Head Start settings, which are of particular interest to this project; a few reports that provide more extensive information about procedures for assessing implementation; and some studies that employed multiple measures to assess implementation.

In terms of assessing “what teachers do” when monitoring progress for individualization, the literature provides some examples of measures that assess how well teachers implement ongoing assessment tools and whether teachers make instructional modifications in response to ongoing assessment data. Specifically, the literature provides a number of examples of how to measure teachers' reliability and fidelity when implementing ongoing assessment activities. However, most of these studies measured whether teachers were able to appropriately administer and score a specific ongoing assessment tool; no studies assessed implementation across a range of ongoing assessment

tools. A few studies measured the actual instructional changes made by teachers in response to ongoing assessment data.

With regard to assessing “what teachers think” and “what teachers know” when implementing ongoing assessment for individualization, the literature provides very few examples of measures that assess how teachers make instructional decisions based on ongoing assessment data and the knowledge necessary for teachers to successfully implement ongoing assessment, especially with infants, toddlers, and preschoolers and in home visiting settings. Goertz et al. (2009) and Roehrig et al. (2008) provide useful examples of methods for studying how teachers make ongoing assessment decisions and what they know about the academic content area, assessment, and instruction. However, as both of these studies were conducted with elementary school teachers, we lack a solid literature base on assessing what teachers and home visitors think and know when implementing ongoing assessment for individualization with infants, toddlers, and preschoolers.

Across all dimensions of implementation, we lack evidence linking measures of teacher implementation of ongoing assessment to student outcomes. In this review, we identified only three studies that examined this question. Two studies of Accelerated Math (AM) (Bolt et al. 2010; Ysseldyke and Bolt 2007) found statistically significant correlations between a measure of teacher fidelity to ongoing assessment procedures (in this case, the number of Accelerated Math objectives completed) and residualized gains in student scores on Terra Nova and STAR Math. However, AM is a comprehensive system with computer-based teacher supports and requires that students take computer-based assessments, so these findings may not inform measure development in the preschool context. In a study of the Repeated Assessment Focused Teaching (RAFT) framework for “managing the type and frequency of data that are made available to teachers, and what teachers do with data once they receive it,” Strand and Cerna (2010) find that changes in teaching behavior—including administering additional academic assessments to students—predicted higher student academic outcomes.

Finally, we found only one study that used multiple measures of teachers’ implementation of ongoing assessment and a measure of teachers’ knowledge to examine how teachers’ thinking and knowledge affect their actions when implementing ongoing assessment for individualization. Specifically, Goertz et al. (2009) failed to find a relationship between teachers’ mathematical knowledge for teaching and teachers’ ability to respond to student misconceptions.

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## CHAPTER IV. IMPLICATIONS FOR THE DEVELOPMENT OF A MEASURE AND FUTURE RESEARCH

### Key Findings

- The literature provides guidance on the activities involved in the process of using ongoing child assessment for individualization but not how to support its successful implementation or how to measure it.
- No existing measure of implementation assesses the full range of activities involved in teachers' use of ongoing assessment to individualize instruction.
- A measure of the implementation of teachers' use of ongoing assessment needs to go beyond what is already in the literature by capturing an array of the activities involved in the process, assessing implementation across a range of ongoing assessment tools, capturing domains other than language/literacy, and applying to early childhood settings.

The use of ongoing assessment in early childhood education (either within the context of RTI or as a stand-alone practice) has garnered increased attention from educators, administrators, policymakers, and researchers (Buysse and Peisner-Feinberg 2013; Division for Early Childhood of the Council for Exceptional Children 2013). The field is still in the early stages, and research on the implementation and effectiveness of ongoing assessment is still growing. As implementation spreads, formulating processes for measuring the quality of implementation and understanding implementation challenges will be crucial. This information can help researchers as they seek to understand whether and how ongoing assessment to individualize instruction can improve teaching practices and, ultimately, child outcomes.

This review summarized the current literature on ongoing child assessment and gathered information to inform the development of a measure of teachers' use of ongoing assessment for individualization in preschools. Because the breadth of research on this topic in the early childhood arena is limited, our review also included research conducted in early elementary schools (kindergarten through 3rd grade). Although the review includes research conducted in the early elementary grades, we recognize that the age groups within that span have different instructional needs and carry different implications for the implementation of ongoing assessment for individualization. As such, the information may need to be adapted to fit the preschool context.

In this chapter, we identify implications of the literature for the development of a measure of teachers' use of ongoing assessment to individualize instruction. Specifically, we describe the state of knowledge about the critical areas of ongoing assessment to individualize instruction and how others have measured teachers' use of ongoing assessment. We also describe implications for future research.

### A. Implications for the Development of a Measure

To develop a measure of teachers' implementation of ongoing assessment for individualization, we need to (1) identify the constructs to be assessed by the measure and (2) determine approaches to measuring those constructs. With regard to the former, existing research provided us with a roadmap of the aspects of implementation that must be in place for ongoing assessment to achieve its expected outcomes; understanding the aspects of implementation that need to be present will

enable us to design a measure of implementation that will assess the critical constructs. With regard to the latter, although the limited examples of existing measures identified in the review were instructive, neither any single measure nor the body of literature as a whole are sufficient to completely inform the development of a measure that will assess an array of activities in the process across a range of tools. Next, we discuss each of these aspects in more detail.

### **1. Limited Rigorous Evidence on Key Activities in the Process; Largely Best Practices**

Limited rigorous evidence exists about the areas critical for the successful implementation of ongoing child assessment to individualize instruction. The existing literature does not provide guidance on what we should look for to determine whether these activities are being implemented well, nor does it describe the factors that influence teachers' abilities to implement the activities well. The literature does, however, give us an understanding of the perceived best practices in implementing these activities, as well as the range of activities we are likely to see in early childhood settings. Limited research is available about some of the activities involved in the process of using ongoing child assessment data for instruction and individualization. Most of the studies focus on one or two of the activities and few focus on the process in its entirety. In terms of domain and setting, research is very limited about the use of ongoing assessment in domains other than language and literacy and, to a lesser extent, social and emotional development and mathematics. The research is largely limited to the early elementary level, and minimal research focuses on using ongoing assessment in home visiting programs and supporting families to conduct observations and assessments. Few causal studies have examined which types of ongoing support for teachers, particularly teachers working with children from birth to age 5, may lead to improvements in teacher knowledge, instructional quality, and child outcomes. Given the paucity of rigorous research on these activities, we sometimes relied on perceived best practices, professional guidelines, and recommendations from expert consultants to help us identify the key activities to include in a measure of early childhood teachers' use of ongoing assessment for individualization.

### **2. Limited Examples of Measures of Teacher Implementation; None Sufficiently Comprehensive**

The literature provides some limited examples of existing measures to assess teachers' use of ongoing assessment for individualization. Measures of "what teachers do" when monitoring progress for individualization largely focus on teachers' reliability and fidelity when implementing ongoing assessment activities, particularly when administering and scoring a specific ongoing assessment tool; a few studies measured the actual instructional changes made by teachers in response to ongoing assessment data. With regard to assessing "what teachers think" and "what teachers know" when implementing ongoing assessment for individualization, the most useful examples were conducted with elementary school teachers, leaving us with a lack of literature on assessing what teachers think and know when implementing ongoing assessment for individualization with infants, toddlers, and preschoolers. The one study that used multiple measures to assess how teachers' thinking and knowledge affect ongoing assessment and individualization did not identify a relationship. Across all dimensions of implementation, we lack evidence linking assessments of teachers' implementation of ongoing assessment to student outcomes.

Overall, many of these studies provide minimal detail about the measures they used, limiting their usefulness to this project. No studies assessed implementation across a range of ongoing assessment tools, and the vast majority of studies measured implementation of a single activity or a small sampling of activities in the process rather than the entire process. Thus, the existing measures

identified in this review were not sufficient to completely inform the development of a preschool measure assessing an array of activities in the process across a range of assessment tools.

## **B. Implications for Future Research**

This review points to a number of gaps in the knowledge base about ongoing assessment for individualization that future research should address. In particular, additional research is needed on the use of ongoing assessment with curriculum-embedded assessments and in domains other than literacy and language. Further, studies are needed to help the field better understand whether and how teachers use ongoing child assessment to individualize instruction. Current literature suggests that teachers struggle to make this leap from collecting data to using it, but few studies have closely examined all of the activities involved in implementation to understand this process completely. The T3 measure builds on the current literature but extends beyond it by capturing an array of the activities involved in the process and assessing implementation across a range of ongoing assessment tools. Ultimately, research will be needed to determine whether high-quality implementation of ongoing assessment to inform individualization as assessed with the T3 is linked to improved instructional practices and, ultimately, positive child outcomes.

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## **APPENDIX A**

### **DEFINITIONS OF KEY TERMS RELATED TO ONGOING ASSESSMENT**

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## DEFINITIONS OF KEY TERMS RELATED TO ONGOING ASSESSMENT

Term	Definitions Derived from the Literature
Authentic assessment	Authentic assessment is any type of assessment that involves gathering information about a child's functioning during real-life activities and in everyday routines through naturalistic inquiry methods (for example, observations and portfolios). <sup>a</sup>
Curriculum-based assessment (CBA)	CBA is a general term encompassing methods to collect information about children's skills or knowledge in reference to the curriculum being implemented. Measurement materials are aligned or linked with the curriculum. CBA can involve a variety of data collection tools, such as observation recording forms, worksheets, and portfolios, as well as standardized, objective tests. <sup>b</sup>
Data-based decision-making (also called data-driven or data-informed decision-making)	Data-based decision-making refers to systematically collecting and analyzing various types of data to guide a range of decisions with a goal of increasing the success of students and schools. At the student level, data can be used to individualize or differentiate instruction or to determine placement in and the movement between tiers of service delivery. <sup>c</sup>
Formative assessment	In K–12 education, formative assessment is a process that is intended to provide feedback to teachers about students' performance or progress at regular intervals during the course of instruction. In special education, formative assessments are used to provide information about how students are responding to instruction and whether they are making progress toward goals and objectives. <sup>d</sup>
Interim assessment	In K–12 education, interim assessments are primarily designed to be aggregated at a level beyond the classroom, such as the school or district level, and typically measure status rather than progress (for example, assessing mastery of information in each chapter in preparation for a summative chapter on a unit of study). However, assessment data can also be used at the student or teacher level. <sup>e</sup>
Progress monitoring	Progress monitoring is a scientifically based practice that assesses children's performance in a variety of domains and employs child data to inform, evaluate, and modify instructional practices. <sup>f</sup> Progress monitoring is typically used in K–12 education to identify children at academic risk and to ascertain skill deficits. <sup>g</sup> It is used to inform decisions about instructional grouping, determine skill strengths and deficits, screen children for potential school failure, and provide information on eligibility for access to services. <sup>h</sup>
Response-to-Intervention (RTI)	In K–12 education, RTI is the practice of providing high-quality teaching and differentiated instruction that is matched to children's needs. RTI models incorporate four common elements: (1) screening, (2) tiered levels of evidence-based, high-quality instruction, (3) ongoing progress monitoring, and (4) decision-making about the delivery of instruction based on progress-monitoring data. <sup>i</sup> At Tier 1, students receive evidence-based instruction from their classroom teacher, who monitors their progress. A child who is not responding to instruction moves to Tier 2 and receives additional support from the classroom teacher or another person. If progress monitoring reveals that the child still is not responding to instruction, the child qualifies for additional support, a special education evaluation, or receipt of special education at Tier 3. <sup>k</sup>

<sup>a</sup>Botts et al. 2007; Edelman 2011; Grisham-Brown et al. 2008; Keilty et al. 2009; Pretti-Frontczak, forthcoming; Synder et al. 2008.

<sup>b</sup>Fuchs et al. 2011; Spencer et al. 2012; Ysseldyke and Bolt 2007.

<sup>c</sup>Hamilton et al. 2009; Kashima et al. 2009; Marsh et al. 2006; Pretti-Frontczak, forthcoming.

<sup>d</sup>Hamilton et al. 2009.

<sup>e</sup>Hamilton et al. 2009; Marsh et al. 2006.

<sup>f</sup>National Center on Student Progress Monitoring 2012.

<sup>g</sup>Safer and Fleischman 2005.

<sup>h</sup>Foegen et al. 2007; Fuchs et al. 1991.

<sup>i</sup>Gettinger and Stoiber 2012; Gersten et al. 2009; Buysse and Peisner-Feinberg, 2013.

<sup>j</sup>Buysse et al. 2013.

<sup>k</sup>Vaughn and Fuchs 2003.

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## **APPENDIX B**

### **ONGOING ASSESSMENT TOOLS COMMONLY USED IN EARLY CHILDHOOD EDUCATION**

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## ONGOING ASSESSMENT TOOLS COMMONLY USED IN EARLY CHILDHOOD EDUCATION

Name of Tool	Description
<b>Screening or Developmental Monitoring Tools</b>	
Ages & Stages Questionnaires® Third Edition (ASQ-3) <sup>a</sup> (Squires and Bricker 2009)	A criterion-referenced assessment designed to be completed by parents to monitor the development of children from birth to age 6. Can also be completed by a caregiver who sees the child 20 hours or more each week. Supplemented with recommended activities to implement for different developmental levels.
Denver II and Denver II Online <sup>a</sup> (Denver Developmental Materials, Inc.® 2013)	Designed as a quick developmental screening test to identify delays in cognition, language, mental health, motor, or self-help skills. A technology component is available.
<b>Curriculum-Embedded Approaches</b>	
Assessment, Evaluation, and Programming System for Infants and Children (AEPS) (Bricker 2002)	A curriculum-based assessment used to assess and monitor six key developmental areas in young children: fine motor, gross motor, cognitive, adaptive, social-communication, and social. AEPS is used with children from birth to age 6 who have disabilities or are at risk for developmental delays. Technology component is available.
Child Observation Record (COR) <sup>a</sup> (High/Scope Educational Research Foundation 2003)	A curriculum-based assessment providing systematic observational assessment of young children's knowledge and abilities in multiple domains of development. The Preschool COR is used to assess children from age 2½ to 6 years, and the Infant-Toddler COR is for programs serving children between ages 6 weeks and 3 years. A technology component is available.
Desired Results Developmental Profile (DRDP) <sup>a</sup> (California Department of Education and Center for Child and Family Studies at WestEd 2013)	A criterion-referenced assessment designed to assess multiple developmental domains for children from birth to age 12. The DRDP is aligned with California learning and development foundations. A technology component is available.
Galileo G3 Assessment Scales for children ages 3-5 <sup>a</sup> (Feld 2011)	A criterion-referenced (standards-based) multimethod assessment aligned with the Head Start Child Development and Learning Framework. A K-12 version is available. A technology component is also available (including recommendations for instructional activities).
Hawaii Early Learning Profile® (HELP® 0-3) and HELP® 3-6 (2nd Edition) <sup>a</sup> (VORT Corp. 2006, 2010)	Curriculum-based assessments used to assess cognitive, language, gross motor, fine motor, social, and self-help development. Support is provided online for entering and reporting information to the Office of Special Education Programs.
Learning Accomplishment Profile (LAP) and Early Learning Accomplishment Profile (E-LAP) <sup>a</sup> (Hardin and Peisner-Feinberg 2001, 2004)	A criterion-referenced observational assessment used to assess development across six domains. The E-LAP assesses children from birth to 36 months old (414 developmental skills arranged hierarchically). The LAP assesses children from 36 to 72 months old (383 developmental skills arranged hierarchically). A technology component is available.
The Ounce Scale <sup>(TM)a</sup> (Meisels et al. 2003)	A criterion-referenced observational assessment used to document the development of children from birth to 42 months. It consists of three interrelated elements: observation records, family albums, and developmental profiles and standards. A technology component is available.
Teaching Strategies: GOLD <sup>a,b</sup> (Teaching Strategies, Inc. 2011)	A criterion-referenced observation-based assessment system. It is grounded in 38 research-based objectives that include predictors of school success and are aligned with state early learning standards, the Common Core State Standards for kindergarten, and The Head Start Child Development and Early Learning Framework. It can be used with children from birth through kindergarten. A technology component is available.

Name of Tool	Description
Work Sampling System (WSS) <sup>a</sup> (Dichtelmiller et al. 2001)	A criterion-referenced, curriculum-embedded observational assessment used to document children's work and classroom behavior across domains. It consists of three interrelated elements: developmental guidelines and developmental checklists, portfolios, and summary reports. It is available for children in preschool through 6th grade. A technology component is available.
<b>General Outcomes Measurement</b>	
Individual Growth and Development Indicators (IGDIs) for Infants and Toddlers (Greenwood et al. 2011b; Greenwood et al. 2006; Walker et al. 2008)	Different tasks used to monitor the growth of infants and toddlers across multiple domains. A school-age version (DIBELS) is available. A technology component is also available.
Preschools IGDIs (Missall et al. 2008; Roseth et al. 2012)	Different tasks used to monitor the growth of preschoolers in language and literacy (Get It, Got It, Go). A school-age version (DIBELS) is available. A technology component is also available.
m-CLASS CIRCLE (Wireless Generation, Inc. 2010)	A web-based system that includes ongoing assessment tools and data linked to approaches for individualizing instruction in the social, emotional, early literacy, and early math domains for 3- to 5-year-olds. A school-age version is available. A web-based system is also available.

<sup>a</sup>Reported as primary assessment by more than 5 percent of teachers in the Head Start Family and Child Experiences Survey (FACES) (Hulseley et al. 2010) and the Early Head Start Family and Child Experiences Study (Baby FACES) (Vogel et al. 2011).

<sup>b</sup>Earlier versions for Teaching Strategies GOLD<sup>®</sup> were called Creative Curriculum<sup>®</sup> Developmental Continuum for Ages 3–5 (Teaching Strategies, Inc. 2001) and Creative Curriculum<sup>®</sup> Developmental Continuum for Infants, Toddlers, & Twos (Teaching Strategies, Inc. 2006).

**APPENDIX C**  
**LITERATURE REVIEW METHODS**

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## LITERATURE REVIEW METHODS

To identify references for review, we conducted a library search. (Table C.1 presents the parameters and search terms.) The search was targeted to research related to early childhood education (which we defined as including children from birth through 3rd grade) and early childhood special education. To plan for the library search, we identified a list of search terms. The federal project officers reviewed and provided input on the draft and final list of search terms. The search was limited to references from the past 10 years (2002–2012).

**Table C.1. Search Criteria**

Search Criteria	Parameters
Target populations	Infant* OR toddler* OR preschool* OR “pre-school”* OR “early elementary”
Search terms	Progress Monitoring (descriptor) OR “progress monitoring” OR “response to intervention” OR “instructional effectiveness” OR “multi-tier* systems of support”  Differentiated Instruction (descriptor) OR ([differentiated OR personal* OR individualized] AND [assessment OR monitoring])  Curriculum-based Assessment (descriptor) OR “curriculum-based assessment”  (Benchmark OR curriculum-embedded OR “curriculum embedded” OR curriculum-referenced OR formative) AND assessment  (Data-based OR data-informed OR data-driven) AND (“decision making” OR decision-making)
Years	2002–2012

Professional library staff conducted searches in EBSCOhost and Sage. EBSCOhost links to Education Research Complete and the Education Resource Information Center (ERIC). Education Research Complete provides indexing and abstracts for more than 2,100 journals, as well as full text for more than 1,200 journals, and includes full text for nearly 500 books and monographs. The topics covered include all levels of education from early childhood to higher education, and all educational specialties, such as multilingual education, health education, and testing. ERIC contains more than 1.3 million records and links to more than 323,000 full-text documents dating back to 1966. In addition, some members of the expert consultant group recommended studies to include in the literature review. Together, the library search and the expert recommendations identified 1,320 unduplicated references (1,276 references from the library search and 44 from the expert recommendations) (Table C.2).

A team of three trained reviewers carefully screened all references for relevance. Based on a set of criteria determined by the project team, this process resulted in 173 references that were screened in as relevant for this review (see Table C.2). Studies were primarily screened out for being off-topic. A small number of these studies were unrelated to ongoing child assessment. The majority of off-topic studies related to early childhood assessment, differentiated instruction, or another generally relevant area, but they did not focus on making individualized instructional decisions based on assessments that were administered on an ongoing basis. For example, some studies mentioned ongoing assessment in the context of Response to Intervention but focused primarily on universal screening and not on ongoing assessment (that is, progress monitoring) to inform and/or individualize instruction.

**Table C.2. Results of the Literature Search and Screening Process**

Screening Disposition	Number of Studies
Total number of unduplicated studies	1,325
<i>Unduplicated studies identified through the library search</i>	1,281
<i>Unduplicated studies recommended by experts</i>	44
Screened in	173
Screened out	1,152
<i>Off-topic</i>	1,079
<i>Not an eligible target population</i>	35
<i>Not a relevant document type</i>	37
<i>Not published in English</i>	1

Next, we extracted information from relevant studies along key dimensions. The review team used a standard form (Appendix D) to consistently collect information across studies. The form captures information including:

- Study's definitions of key terms, including progress monitoring, curriculum-embedded assessment, curriculum-based assessment, general outcome measures, formative assessment, and related terms
- Findings about the effectiveness of ongoing assessment
- Contextual information, including characteristics of the setting, ages of the children in the sample, subject area or outcome domain in which ongoing assessment was used, and information about the teachers implementing ongoing assessment (including education, experience, demographics, familiarity with ongoing assessment, and support received to implement ongoing assessment)
- Descriptions of the types of assessments being implemented, the methods used for collecting and organizing data (including frequency of and schedules for data collection), and how data were interpreted and applied to instruction, as well as whether and how families were engaged in the process
- Descriptions of tools used for ongoing assessment
- Descriptions of conceptual models related to ongoing assessment presented in the literature
- Descriptions of how implementation quality and fidelity were measured, including descriptions of the measures used

**APPENDIX D**  
**TEMPLATE FOR REVIEWING STUDIES**

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## TEMPLATE FOR REVIEWING STUDIES

### Study Information

**RefWorks ID:** *Enter text*

**Citation:** *Enter text*

**Abstract:** *Enter text*

**Source:**

- Library search
- Project team member
- Expert consultant

**Document type:**

- Empirical study
- Literature review/  
meta-analyses
- Conceptual
- Measure/tool
- Guide/recommendations/ best  
practices

**If empirical study, study  
design:**

- Descriptive
- RCT
- QED
- SCD

### Topics Discussed

*Check all items that apply.*

**Description of assessment**

- Authentic
- Assessment for learning
- Classroom
- Curriculum-embedded
- Curriculum-based
- General outcome measurement
- Formative
- Benchmark
- Interim
- Ongoing
- Response to Intervention
- Functional Behavioral Assessment
- Positive Behavior Support
- IGDI
- Recognition & Response
- Other (describe): *Enter text*

**Methods of collecting data**

- Anecdotal records
- Checklists
- Naturalistic observation
- Ratings
- Rubrics
- Structured task
- Semi-structured task
- Mastery test
- Work samples
- Computer-assisted
- Other (describe): *Enter text*

**Domain**

- Cross-domain
- Health
- Literacy/language
- Mathematics
- Mental health
- Science
- Social and emotional

**Methods of organizing data**

- Web-based system
- Computer-assisted
- Curriculum-provided
- Teacher/home visitor or  
program developed
- Other (describe): *Enter text*

**Context**

- Family involvement
- Fidelity of implementation/  
implementation quality
- Organizational support/  
infrastructure
- Support for direct service staff  
(coaching, supervision, training, TA)
- Other (describe): *Enter text*

**Application to instruction**

- Data-based/informed/driven decision-making
- Data-driven instruction
- Differentiated instruction
- Individualization/individualized instruction
- Personalization of instruction
- Adaptations (assistive aids or scaffolds)
- Modifications to lessons or activities
- Other (describe): *Enter text*

### Setting and Child Characteristics

Check all items that apply.

#### Setting

- Primary school
- Head Start/ Early Head Start
- Child care center
- Home visiting (family home)
- Home-based care (family child care)
- Other (describe): *Enter text*

#### Age of target population

- Infant/toddler
- Preschool (ages 3–4)
- K–grade 3 (ages 5–9)
- Family/parent(s)
- Other (describe): *Enter text*

#### Characteristics of target population

- Dual-language learners
- Children with disabilities
- Low-income
- Other (describe): *Enter text*

### Staff Characteristics

Complete as applicable. Include page numbers.

**Staff education:** *Enter text*

**Staff experience:** *Enter text*

**Staff experience with ongoing assessment:** *Enter text*

**Staff demographics:** *Enter text (examples include age, race/ethnicity, primary language)*

**Supports offered to staff to support implementation of ongoing assessment:** *Enter text (examples include training (initial and ongoing), coaching, mentoring, supervision, technical assistance)*

### Study Purpose and Findings

Complete as applicable. Include page numbers.

**Study purpose:** *Enter text*

**Summary of study findings:** *Enter text*

**Description of tool/measure used for ongoing assessment, if applicable:** *Enter text*

**Definitions of key terms from “description of assessment,” if applicable:** *Enter text*

**Page numbers of literature review, if applicable:** *Enter page numbers*

**Description of conceptual model, if applicable:** *Enter text*

**Description of measure to assess implementation of ongoing assessment, if applicable:** *Enter text*



