

***MASSACHUSETTS DEPARTMENT OF
EARLY EDUCATION AND CARE
ALIGNMENT STUDY***

***DELIVERABLE V:
SUMMARY OF FINDINGS AND RECOMMENDATIONS***

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I. Context and Purpose of the Study

For many decades, Massachusetts has been a national leader in the provision of early education and care for its young children. Consistent with this historically prominent role, Massachusetts has recently begun a thorough and systematic analysis of its early learning and development standards. The analyses include an evaluation of the ways in which the current standards for young children, birth to age five, are aligned with the state’s kindergarten standards and other national standards documents, notably the Head Start Child Development and Early Learning Framework (HSCDEL), which applies to children enrolled in the nation’s Head Start program, and the kindergarten-level Common Core standards. In addition, Massachusetts has sought to better understand if its standards for young children are aligned with the assessments it may be using to gauge the development of young children’s competencies and learning. This ambitious effort to create a coherent continuum of the highest-quality standards that can be used as the basis for a comprehensive birth-to-third-grade system of early education reflects the state’s continued national leadership in how best to serve its youngest citizens and their families.

As part of this effort, Sharon Lynn Kagan, Catherine Scott-Little, Jeanne Reid, and their teams at Teachers College, Columbia University, and the University of North Carolina at Greensboro, respectively, have been working as consultants for the Department of Early Education and Care to conduct an 18-month analysis of the content and alignment of the Massachusetts early learning and development documents. To do so, a suite of studies was conducted; these have been presented in four deliverables. This document, the fifth and final deliverable, briefly summarizes the methods and overall findings from the suite of studies, provides recommendations for how Massachusetts might use the findings to strengthen its standards and assessment system, and suggests the sequence that Massachusetts might follow to use and implement the standards and the recommendations pertinent to them.

II. Methods

The suite of studies included the following four separate analyses:

- 1) *Deliverable I: Content Analysis of the Early Learning and Development Standards (Infants, Toddlers, Preschool, and Kindergarten)*
- 2) *Deliverable II: Alignment Analyses of the Early Learning and Development Standards and the Head Start Child Development and Early Learning Framework (Toddler vs. Preschool, Preschool vs. Kindergarten, and Preschool vs. the HSDCEL)*
- 3) *Deliverable III: Alignment Analyses of the Massachusetts Preschool Standards and Three Assessments for the Same Age Group*
- 4) *Deliverable IV: Alignment Analyses of the Massachusetts Kindergarten Standards and Two Assessments for the Same Age Group*

To analyze the data, we conducted reviews in three analytic dimensions: Balance, Coverage/Depth, and Difficulty. In the Balance analysis, we assessed the degree to which the indicators address each of the five domains of learning and development (Physical Development & Motor Skills, Social & Emotional Development, Approaches Toward Play & Learning, Language & Communication Development, and Cognitive Development & General Knowledge). In the Coverage/Depth analysis, we assessed the degree to which constructs are addressed within each domain and the relative degree of depth in which they are covered. In the Difficulty analysis, we assessed the relative degree of cognitive demand or complexity represented in indicators from each of two standards documents. We conducted both *horizontal alignment* analyses, in which we compared documents that target the same age groups, and *vertical alignment* analyses, in which we compared documents that target younger and older age groups.

When interpreting the results of the Balance, Coverage/Depth, and Difficulty analyses, we considered both their level of “match” (the degree to which any two documents are aligned along each dimension), and “quality” (the degree to which the documents address the critical areas of early learning and development). It is important to remember that documents may be well aligned, but of low quality because they do not cover essential constructs of early learning and development. Therefore, our recommendations reflect an evaluation of both the content and alignment of the standards documents, with careful attention to their underlying quality.

To carry out each of these analyses, we reviewed the relevant standards documents, focusing on “indicators” that describe the observable or measureable skills and knowledge children demonstrate. These indicators were analyzed by coding them to a Construct Template, developed by the research team and used in prior studies. The Construct Template is a common metric and analytical framework that reflects the unique and multi-domain aspects of learning and development for children from birth to age eight; as such, it allows for the quantitative and qualitative analysis of the content and alignment of standards and assessments within and across a broad range of ages. In the coding process, each indicator is given a code from the template that best reflects the content of the indicator. With coding rules to guide the research team, use of the template has proven to be highly reliable in our prior work. For the current project, our inter-rater reliability consistently exceeded 85%.

III. Summary of Findings

In this section, we briefly summarize the findings from each analysis. For a more complete summary of the findings, please see *Appendix A*.

III.1. Overview

The results presented in the four deliverables affirm that Massachusetts has a solid set of standards, but could strengthen them and improve their alignment by paying more attention to the domains of Social & Emotional Development and Approaches Toward Play & Learning, as well as to Physical Development & Motor Skills. More attention could also be accorded to the cognitive processes, particularly in the preschool and kindergarten standards. In addition, the standards across all age levels could be improved by attending explicitly to English Language Learners, and to the current understanding of children's abilities in mathematics at very early ages. Many areas of misalignment were found between the standards and the HSCDEL, which generally covers more areas of early learning than the preschool standards. The results were mixed in terms of how well the three assessments used in preschool and the two assessments used in kindergarten align with the respective Massachusetts standards.

III.2. Findings from the Content Analyses

The content analyses are foundational to the rest of the study because they assess whether the standards as a set are covering, with the requisite balance and depth, the learning and developmental domains and constructs of knowledge and skills that young children need to know and be able to do. We summarize the results below by age level:

III.2.a. The Standards for Infants and Toddlers:

- Are well balanced across the five domains, although Approaches Toward Play & Learning receives less attention than the other four.
- Could more fully reflect the most recent mathematics research.

III.2.b. The Standards for Preschool:

- Do not have a domain for Approaches Toward Play & Learning.
- Devote little attention to Social & Emotional Development, and only somewhat more to Physical Development & Motor Skills.
- Do not cover Learning a Second Language.
- Focus heavily on the subject areas, less on the cognitive processes.
- Could more fully reflect the most recent mathematics research.

III.2.c. The Standards for Kindergarten:

- Do not have a domain for Approaches Toward Play & Learning.
- Devote little attention to Social & Emotional Development, and only somewhat more to Physical Development & Motor Skills.

- Do not cover Learning a Second Language.
- Focus heavily on the subject areas, less on the cognitive processes.
- Could more fully reflect the most recent mathematics research.

III.3. Findings from the Vertical Alignment Analyses

The vertical alignment analyses assess whether the Massachusetts early learning and development standards are aligned with each other so that they represent a continuum of learning expectations across the age span. More specifically, vertical alignment analyses seek to determine if the standards from one age group articulate continuous, logically sequenced content and cognitive demand to the next, thus supporting children’s growth through the early years.

III.3.a. Alignment between the Standards for Toddlers and Preschool:

- The toddler standards accord heavier weight to Social & Emotional Development, Approaches Toward Play & Learning, and Physical Development & Motor Skills than do the preschool standards.
- The preschool standards accord heavier weight to Language & Communication Development and Cognitive Development & General Knowledge than do the toddler standards.
- The toddler standards address Learning a Second Language, while the preschool standards do not.
- Some of the toddler indicators are more difficult than the preschool indicators (e.g., in Mathematics).

III.3.b. Alignment between the Standards for Preschool and Kindergarten:

- The preschool standards align well with the kindergarten standards at the domain level because both reflect an imbalance across the five domains. In other words, the preschool standards and kindergarten standards, while well-aligned, do not represent quality early learning and development standards because they both have omitted important areas of children’s learning and development (i.e., in Social & Emotional Development, Approaches Toward Play & Learning, and Physical Development & Motor Skills).
- Some of the kindergarten indicators, most commonly in Mathematics and to a lesser extent in English Language Arts & Literacy, and other subject areas, are much more difficult than the preschool indicators, representing big jumps in cognitive demand from one age level to the next.
- A few of the preschool indicators, most commonly found in History and Social Science, were deemed to be more difficult than the kindergarten indicators.

III.4. Findings from the Horizontal Alignment Analyses

The horizontal alignment analyses assess whether the Massachusetts standards are aligned with the HSCDELf and assessments that target the same age level.

III.4.a. Alignment between the Standards for Preschool and the HSCDELf:

- The HSCDELf accords heavier weight to Social & Emotional Development and Approaches Toward Play & Learning than do the preschool standards.
- The HSCDELf addresses Learning a Second Language, while the preschool standards do not.
- The HSCDELf devotes more attention to the cognitive processes than do the preschool standards.
- The HSCDELf indicators are often more difficult than the preschool indicators.

III.4.b. Alignment between the Standards for Preschool and Three Assessments:

- All three assessments accord heavier weight to Social & Emotional Development and Approaches Toward Play & Learning than do the preschool standards. All three assessments accord heavier weight to the cognitive processes than do the preschool standards.
- One assessment addresses Learning a Second Language, while the preschool standards do not.
- The results for the difficulty analyses were mixed on all three assessments.

III.4.c. Alignment between the Standards for Kindergarten and Two Assessments:

- Both assessments accord heavier weight to Social & Emotional Development and Approaches Toward Play & Learning than do the kindergarten standards.
- Both assessments accord heavier weight to the mathematics processes and cognitive processes than do the kindergarten standards.
- Both sets of assessments were coded as less difficult than the kindergarten indicators in many instances.
- One assessment addresses Learning a Second Language, while the kindergarten standards do not.

IV. Recommendations

These findings engender important and remarkably consistent recommendations across the four deliverables. We have grouped them below into four broad themes: (1) standards revision; (2) standards implementation; (3) professional development enhancement; and (4) data collection and use.

IV.1. Standards Revision

The results suggest that some revisions are necessary to create a more holistic set of standards. While the standards for infants and toddlers express a reasonably complete conceptualization of children's early development across the five domains of learning, the preschool and kindergarten standards shift quite dramatically to a heavy emphasis on Cognitive Development and Language & Communication. Given the state's attention to the Common Core, this imbalance is somewhat understandable. Nonetheless, the preschool and kindergarten standards should be revised to reflect the integrated and multi-domain nature of early learning.

As noted in our reports, the findings suggest that Massachusetts must walk a tightrope as it considers how to revise the standards. At once it is obligated to have its standards cover critical areas of development, some of which are missing. It also, however, must be careful not to develop so large a set of standards that their utility to teachers and parents will be diminished. To that end, we suggest the highest priority for additions to the standards should be in the domains that are under-addressed or not addressed at all. Most prominent are the lack of Approaches Toward Play & Learning in the preschool and kindergarten standards, and the insufficient attention accorded to Social & Emotional Development at the same age levels.

We recommend these revisions in full recognition that Massachusetts is also navigating a tightrope between a holistic orientation to the standards, which is most appropriate in children's early years, and an increasingly academic orientation, which is more appropriate as children progress in the elementary grades. This challenge is not unique to Massachusetts and there is no one correct approach to reflect the transition in the content of standards across the age continuum. However such continuity is manifest in the standards revision process, we urge Massachusetts to sustain its fine attention to Social & Emotional Development and Approaches Toward Play & Learning, prominent in the standards for the state's youngest children across the birth to age eight continuum.

We also suggest strengthening the standards across all age levels by according greater attention to the cognitive processes and certain mathematics constructs, such as Operations at the toddler level and Mathematics Processes at the preschool and kindergarten levels, though we acknowledge that such additions should be made with parsimony so as not to further inflate the overall attention accorded to Cognitive Development at these age levels. Even with these revisions, concurrent attention to the domains of Approaches Toward Play & Learning and Social & Emotional Development should help diminish the predominate focus on Cognitive Development and Language & Communication in the preschool and kindergarten standards.

Another priority across all age levels should be the inclusion of supporting children who are learning English as a second language. We have noted in the reports that this can be done in one of several ways. Some states have chosen to create separate domains; others have elected to create separate sub-domains, and still others are addressing these important populations via the learning activities that accompany the standards. Whatever strategy is used, Massachusetts, as an early childhood leadership state, should turn its attention to this critical issue.

Finally, we urge Massachusetts, when thinking about how to strengthen the standards with broader and more complete coverage, to give careful attention to the relative difficulty of the indicators. While this aspect of alignment often receives less attention, we consider it an important aspect of both the quality and alignment of the standards. Our findings and recommendations regarding the relative difficulty of the standards at each age level, detailed in *Appendix A* and in the reports themselves, should provide guidance to the state in this endeavor.

Overall, we recommend Massachusetts revamp its standards to embrace: (i) the latest scientific knowledge; (ii) accepted Common Core standards; (iii) the HSCDELf; and (iv) the unique Massachusetts context, which honors the state's commitment to a holistic conceptualization of early learning. We do not see these as mutually exclusive. We recommend creating a full and robust set of standards that does not eliminate the national documents but, rather, employs them as anchors to a revised set of standards, at least at preschool. Such standards should build on the content of this analysis, paying close attention to the missing constructs. Such an undertaking could be spearheaded by the Department and could build on the capacity and talent that resides therein with some external academic support.

To that end, we recommend that Massachusetts start its revisions with the preschool standards, which are couched in a pivotal spot between the infant/toddler standards and kindergarten standards, and alongside the HSCDELf in many preschool programs. Using the HSCDELf to think about the domains and content that could be included in the standards might be a good place to start. Not only is the HSCDELf quite comprehensive, but it also represents some important areas that are absent from the Massachusetts standards. The revised set of preschool standards could then be used as a metric against which alignment with the older infant/toddler and kindergarten standards could be addressed.

Several strategies can be used to begin the revisions process. We suggest that convening knowledgeable experts to address the domains would be helpful, who would then be provided with the results of our deliverables. Then, the teams could begin to refine the standards according to recent research and data.

The standard revision process should initially give limited attention to alignment with the assessments included in these analyses. The results of the

study indicate that all the assessments demonstrated strengths and weaknesses in terms of their alignment with the Massachusetts preschool and kindergarten standards. This is likely to change, however, as the standards are revised; in fact, the state can expect that alignment with each of the reviewed assessments would increase as the standards are improved, given that the assessments tend to devote more attention to the areas of early learning that we suggest deserve greater attention in the standards. Yet in no way should Massachusetts begin its revision process by choosing an assessment and working backwards. Selecting one of the reviewed instruments at the outset and aligning its standards to that single instrument would be a mistake, as the instruments themselves are not perfect. Instead, we recommend that once the content of the revised standards has been determined, then the content of each assessment should be carefully considered for its alignment to the revised standards. The state may then decide to include one or more instruments that are most closely aligned with the standards within its assessment system.

We stress that we are describing an iterative process where the results of these analyses are used to revise the standards, then alignment between the standards and the assessments is reconsidered, and, after careful consideration, decisions can be made regarding which assessment instrument(s) best meet the state's criteria for alignment and effectiveness.

IV.2. Standards Implementation

Massachusetts understands that standards are the foundation for the implementation of effective instruction; the state acknowledges that under ideal circumstances, standards would be used as a prelude to curriculum modification, teachers' professional preparation and development, formative and summative assessment, and effective monitoring and evaluation through the use of standards-based data. By linking each of these instructional elements to a set of high-quality standards, educational integration and the prospects for improved student performance are enhanced. No longer would assessments be measuring what children have not been taught; no longer would teachers be ill-prepared to infuse the standards into their teaching; and no longer would different criteria drive the states' diverse data collection efforts. In short, the standards need to be considered as the heart of a logical, integrative, and continuous approach to educational improvements.

While the importance of standards' multiple uses is clear, a path to achieving diverse applications is less so. As Massachusetts considers the refinement of its standards, it must also hasten to create a clear implementation plan that specifies how it intends to use its standards. Such a plan should be collaboratively developed across Departments, as is characteristic in the state. It should also delineate a sequencing of efforts so that implementation efforts are carried out logically. For example, standards-based professional and curriculum development should be ensconced prior to the use of assessments for high-stakes

decision making about children. Planning for the effective use of standards as a cornerstone for educational improvement and continuity is at the heart of creating an effective early learning system. Effective planning for the use of standards will support the comprehensive, aligned, and coordinated approach to early childhood education that Massachusetts envisions. In so doing, the state could provide national leadership with its prescient approach to this foundational goal.

IV.3. Professional Development Enhancement

While standards are a pillar of a solid system of early education and care, they must be understood and used appropriately to support a system that truly aims for the highest levels of quality. This challenge can only be met with a sustained commitment at all levels to professional development on how to use the standards to improve instruction and promote children's learning. Programs serving infants and toddlers, preschool educators, and kindergarten teachers, as well as administrators within all levels of the early childhood system, need professional development on the standards themselves so that they are familiar with the content. Professional development is also needed on how to intentionally plan and implement learning experiences based on the standards.

Massachusetts should also strengthen professional development for the appropriate and accurate use of assessment processes. In particular, professional development is needed on how to conduct standards-based observational assessment. The provision of such professional development will improve the quality of data collection and help embed the use of assessment in the practice of early care and education. Regardless of what assessment(s) the state chooses to employ, building capacity for observational assessment in the field will lay the groundwork for an effective standards and assessment system.

When the time is right, the state will also need to provide professional development on the assessment(s) instruments being used in programs. Massachusetts is engaged in a broad and deep examination of its assessment system, with the possibility of selecting one or more assessments for use in the state. The challenge is formidable because no assessment is perfect, and assessments are structured differently and with different conceptual foundations. If the state chooses to use multiple assessments, it will be, of course, somewhat difficult to systematically compare all the data from them with the standards. Certainly, changing to a single assessment entails substantial costs in the short-term, but the long-term costs of supporting multiple assessments are also formidable. In either case, Massachusetts will need to invest in expanded professional development and training regarding the selected assessment(s) once decisions are made about the assessment(s) that will be used.

IV.4. Data Collection and Use

There are two major ways that data related to standards can and should be collected and used. First, Massachusetts should continue its commitment to incorporating rigorous analyses into its programmatic plans. Having data of the sort provided in these alignment studies should be normative for a progressive state. Through such analyses, Massachusetts can be assured of obtaining information directly relevant to the state. In making this recommendation, we affirm the importance of research and analyses on standards themselves, on diverse aspects and processes of implementation and, once well implemented, on the effects of a systemic approach to standards on child outcomes. In short, a standards-based research agenda should be conceptualized and considered as a high priority for the future.

Second, in all states, it is important that when data are collected on young learners, they accord and respect the standards. That is to say, across agencies, data must be collected, but rather than collecting diverse and inconsistent data elements, often redundantly expending time and resources, a consolidated and standards-based approach to data collection should be considered. Such an approach should examine the standards to see if the data being solicited are linked to, and consistent with them. Such a review would not only alleviate redundancy and its attendant costs, but also reduce the challenge of data collection design, implementation, and analyses. Standards are an essential tool for creating a data-driven, efficient, and continuous system of early learning.

V. Sequencing the Recommendations

Implementing these recommendations, which are both broad and deep, is an admittedly significant challenge. We suggest that revision of the standards should be the priority and be guided by the analyses represented in the suite of studies we have undertaken. While the revision process is underway, the state should enhance its professional development to prepare the field to use the standards and early childhood assessment instruments effectively and reliably. Data collection and use, already underway in Massachusetts, should continue and expand to support the state's efforts to strengthen its early childhood policies and programs. Overall, it is critical that Massachusetts consider how the standards can be infused into multiple systems so that they become a cornerstone of a solid birth-to-third-grade system for early care and education.

VI. Conclusion

Massachusetts is to be highly commended for collaborating across departments and levels of government to create a cohesive system of early childhood education and care, with aligned standards, curriculum, and assessments. This is a goal of great scope and ambition, and yet we believe the investment will be well worth the effort, as Massachusetts is already ahead of

other states in trying to enact this vision. We intend for the work detailed in this report to support the state's quest, which would be nationally precedent setting, once again placing Massachusetts at the forefront of state efforts to offer the highest quality education and care to its youngest citizens.

Appendix A: Summary of Deliverables I-IV

To augment the summary of the study, this document provides detailed back-up information from each of the four deliverables provided in this suite of analyses. For each deliverable (I-IV), a brief overview of its purpose, the documents analyzed, the findings, and recommendations is provided. For those interested in even more detailed information, each finding and recommendation presented below is further annotated with the relevant page numbers from the corresponding deliverable.

I. Deliverable I: Content Analysis of the Early Learning and Development Standards

I.1. Purpose

- To investigate the content of the Massachusetts early learning and development standards in order to discern the degree to which they are distributed across the selected domains (Balance) and the degree to which they cover generally accepted constructs for each domain (Coverage/Depth). Note: This analysis does not examine alignment of the standards with other documents.

I.2. Documents Used

- The Early Learning Guidelines for Infants and Toddlers (November 2010)
- The Guidelines for Preschool Learning Experiences (April 2003) in all domains except English Language Arts and Mathematics
- The Kindergarten Learning Experiences (April 2008) in all domains except English Language Arts and Mathematics
- The Curriculum Framework for English Language Arts and Literacy (March 2011): Standards for Pre-Kindergarten and Kindergarten
- The Curriculum Framework for Mathematics (March 2011): Standards for Pre-Kindergarten and Kindergarten

I.3. Key Findings

- Massachusetts has a solid set of standards that addresses the birth-through-age-five continuum. The findings suggest the need to revise the standards to further strengthen their content. Throughout the Massachusetts standards, there is a decided difference between the infant/toddler document and the preschool and kindergarten documents. The first is far more holistic in orientation than the latter two, with the latter two focusing almost exclusively on the two domains of Cognitive Development & General Knowledge and Language & Communication Development. (For the results that support this finding, please see the

Balance analyses on pages 12-13, 20-21, 28-29, and page 36.)

- The omission of Approaches Toward Play & Learning in the preschool and kindergarten documents is striking, as is the minimal emphasis accorded Social & Emotional Development. (For the results that support this finding, please see the Balance analyses on pages 28-29 and page 36.)
- Within the domain of Approaches Toward Play & Learning, at the birth-to-15-month and 12-to-33-month age levels, some constructs are not sufficiently covered, such as Exploratory/Functional Play. (For the results that support this finding, please see the Coverage/Depth analyses on pages 15-16 and 23-24.)
- Within the Cognitive Development & General Knowledge domain, at the preschool and kindergarten levels, there is a heavy focus on the subject areas, but less focus on important cognitive processes, such as reasoning and understanding of cause and effect. (For the results that support this finding, please see the Coverage/Depth analyses on pages 33-34 and 40-42.)

I.4. Key Recommendations

The results suggest that some adjustments are necessary to create a more holistic set of standards, particularly at the preschool and kindergarten levels. Specifically, consideration should be given to rectify domain imbalances; this should be done in combination with the results of the alignment analyses. (Please see pages 44-45.)

II. Deliverable II: Horizontal and Vertical Analyses of the Early Learning and Development Standards (Toddler, Preschool, and Kindergarten) and the Head Start Child Development and Early Learning Framework

II.1. Purpose

- To examine the alignment between several sets of documents: (i) the Massachusetts toddler (22-33 months) and preschool standards; (ii) the Massachusetts preschool and kindergarten standards; and (iii) the Massachusetts preschool standards and the HSCDEL. For each pair of documents, alignment is assessed in terms of Balance, Coverage/Depth, and Difficulty (the relative level of cognitive demand in pairs of indicators).

II.2. Documents Used

- The Early Learning Guidelines for Infants and Toddlers (May 2011) (For

- this phase of the project we focused solely on the Guidelines for Toddlers.)
- The Guidelines for Preschool Learning Experiences (April 2003) in all domains except English Language Arts and Mathematics
 - The Kindergarten Learning Experiences (April 2008) in all domains except English Language Arts and Mathematics
 - The Curriculum Framework for English Language Arts and Literacy (March 2011): Standards for Pre-K and Kindergarten
 - The Curriculum Framework for Mathematics (March 2011): Standards for Pre-K and Kindergarten
 - Head Start Child Development and Early Learning Framework (HSCDELFF)

II.3. Key Findings

The findings from Deliverable II are organized into three sections below: (a) findings at the domain level (the Balance analyses); (b) findings within domains (the Coverage/Depth analyses); and (c) findings regarding the relative level of difficulty.

II.3.a. Findings at the Domain Level (the Balance Analyses)

- The toddler guidelines and the HSCDELFF are fairly balanced across the five domains of early learning and development, addressing the domains with consistent attention to each. In contrast, the Massachusetts preschool standards accord heavy weight to two domains, Language & Communication Development and Cognitive Development & General Knowledge, with 80% of indicators devoted to these two domains. It appears that, in an attempt to be responsive to the national documents (in particular the Common Core), the balance of the Massachusetts preschool standards has been tilted somewhat dramatically and, therefore, the alignment between the preschool standards and the two other sets of standards is relatively poor. (For the results that support these findings, please see the Balance analyses on pages 14, 35-36, and 55-56.)
- The domains of Social & Emotional Development and Approaches Toward Play & Learning are seriously under-addressed in the preschool standards, when compared with both the toddler guidelines and the HSCDELFF. (For the results that support these findings, please see the Balance analyses on page 14 and pages 55-56.)
- The preschool standards align fairly well with the kindergarten standards at the domain level, as both reflect the imbalance across the five domains. In this case, alignment between the two sets of standards is relatively good in terms of a match between the content addressed, but both documents would be higher in quality if they addressed all five domains. (For the results that support these findings, please see the Balance analyses on

pages 35-36.)

II.3.b. Findings within Domains (the Coverage/Depth Analyses)

- Within the Physical Development & Motor Skills domain, more attention could be accorded to Nutrition for the older toddlers and preschoolers, especially given that so much attention is accorded to it at kindergarten. Similarly, more attention could be accorded to Physical Fitness across all three sets of the Massachusetts standards (toddlers, preschool, and kindergarten). Knowledge for Participation in Physical Education for preschoolers also appears to be under-addressed. (For the results that support these findings, please see the Coverage/Depth analyses on page 15, and pages 36-37.)
- Within the domain of Social & Emotional Development, the toddler guidelines and the HSCDELf address a solid range of content, while the preschool standards address only four. Neither the preschool nor the kindergarten documents address Behavioral Regulation, Relationships with Familiar Adults, Relationships with Peers, Social Skills with Adults or Social Conventions, all of which are critically important at both age levels. The kindergarten standards do address Emotional Regulation but the preschool standards do not; conversely, the preschool standards address Social Skills with Peers and Recognition of Others' Feelings while the kindergarten standards do not. (For the results that support these findings, please see the Coverage/Depth analyses on pages 16, 37-38, and 57-58.)
- Within Approaches Toward Play & Learning, the older toddler guidelines and HSCDELf are far more comprehensive, as neither the Massachusetts preschool or kindergarten standards address this domain. At the toddler level, Exploratory/Functional Play, Initiative, and Invention & Creativity could have received more attention. At the preschool and kindergarten levels, at a minimum, Initiative, Persistence & Mastery Motivation, Concentration/Attention Control, Cooperative Approach to Learning, Problem Solving, Invention & Creativity, and Shared Peer Activities/Social Play should be considered for inclusion in the standards. It may be that a separate domain in this area is not desired, but certainly the critical constructs above should be included at the preschool and kindergarten levels, as they are important components and accelerators of children's learning and development. (For the results that support these findings, please see the Coverage/Depth analyses on pages 17, 38-39, and 58-59.)
- Within Language & Communication Development, there was solid alignment between the toddler and the preschool standards. Having noted this, two constructs expressed in the toddler standards are not

represented at the preschool or kindergarten levels, and yet deserve attention: Receptive Verbal Communication and Learning a Second Language. The HSCDELFF devotes almost a third of its indicators that were coded to Language & Communication Development to Learning a Second Language. (For the results that support these findings, please see the Coverage/Depth analyses on pages 18-19, 39-40, and 59-61.)

- The domain of Cognitive Development & General Knowledge poses some challenges when addressing the alignment of standards at all levels. At the toddler, preschool, and kindergarten levels, relatively few indicators are devoted to cognitive processes, favoring the subject areas, such as mathematics, science, and social studies. To that end, far more attention should be accorded to Comparisons, Representational/Symbolic Thought, Reasoning, Conjecture, Hypothesizing, & Guessing, Perspective Taking, and Reflection on Thought Processes at all age levels. The HSCDELFF does a somewhat more thorough job in this area, although there are numerous constructs that could be considered here, as well. (For the results that support these findings, please see the Coverage/Depth analyses on pages 20-22, 41-42, and 62-64.)
- In all three of the Massachusetts documents, there is a large emphasis on the subject areas. Even so, in light of new research in the Mathematics area, more attention could be devoted to this area even at the toddler level, while at the preschool and kindergarten levels (as well as in the HSCDELFF), more focus on Data, Measurement, and Mathematics Processes should be included; Algebraic Thinking should also be considered at kindergarten. In the Science and Social Studies areas, alignment is present, but so is the absence of certain critical constructs (e.g., Culture at preschool and kindergarten). The HSCDELFF is a bit more comprehensive in the science and social studies areas. (For the results that support these findings, please see the Coverage/Depth analyses on pages 20-23, 41-43, and 62-65.)

II.3.c. Findings from the Difficulty Analyses

- The Difficulty analyses, which compare the relative level of cognitive demand in pairs of indicators from each document, indicate that, in general, the Massachusetts documents seemed to be better aligned with one another than were the Massachusetts preschool standards and the HSCDELFF, with the HSCDELFF often being more difficult. (For the results that support these findings, please see the Difficulty analyses on pages 24-25, 44-45, and 66-67.)
- A major exception was in the area of English Language Arts, where the Massachusetts preschool standards were more difficult than the HSCDELFF.

Attention might also be accorded to the alignment of the preschool and kindergarten standards in this area, wherein a substantial portion of the indicators at kindergarten level were coded as equal in difficulty with the preschool standards. (For the results that support these findings, please see the Difficulty analyses on pages 45-46 and 67-68.)

- In the Mathematics area, many of the indicators for the toddlers were more difficult than those for the preschoolers. In other cases, there was a large jump in the difficulty of the indicators across the two age groups. This large jump was also evinced between preschool and kindergarten, where a large number of the paired indicators were coded as much more difficult in kindergarten. Similarly, when examining alignment in this content area, the HSCDEL should be consulted, in that many of its indicators in mathematics were also coded as more difficult than the Massachusetts preschool indicators. (For the results that support these findings, please see the Difficulty analyses on pages 26-27, 46-47, and 68-69.)

II.4. Key Recommendations

- The Balance and Coverage/Depth findings suggest that Massachusetts must walk a careful tightrope. At once, it is obligated to have its standards cover critical areas of development, some of which are missing. It also, however, must be careful not to develop so large a set of standards that their utility to teachers and parents will be diminished. To that end, we suggest the highest priority for additions to the standards should be in the domains that are under-addressed or not addressed at all (pages 78-80).
- Couched between the older toddler and kindergarten standards, the preschool standards should be carefully reviewed to more robustly cover under-addressed domains, notably Social & Emotional Development and Approaches Toward Play & Learning. While there is some alignment between preschool and kindergarten in that they both inadequately address these domains, such alignment is not positive and should be accorded attention. In addition, attention should be accorded at all three age levels to the Cognitive Development & General Knowledge domain, with special focus on mathematics and cognitive processes (page 81).
- Massachusetts should also discern how it wishes to handle standards for dual language learners more explicitly at the preschool and kindergarten levels. No definitive pattern for doing so has emerged throughout the nation, with some states electing to create separate domains; others creating separate sub-domains; and still other states addressing these important populations via the learning activities that accompany the standards. In some cases, explicit attention is accorded to children who fall

into this category. Whatever strategy is used, Massachusetts—as an early childhood leadership state—should turn its attention to these critical issues (page 81).

- In terms of alignment regarding the difficulty of the standards, we recommend that Massachusetts look at the areas where the difficulty of standards is not progressive, particularly in the area of Mathematics, and try to create a smoother progression in the cognitive demand between indicators at a younger age level and indicators at an older age level (pages 80 and 82).
- As noted in the difficulty analyses, there were a large number of unpaired indicators, suggesting that the toddler standards and the HSCDEL F covered content that is not addressed in the preschool standards. Using the HSCDEL F would be a good (though not perfect) metric from which to embark on an analysis of where there are omissions in the preschool standards. Not only is the HSCDEL F quite comprehensive, but it also represents some important areas that are absent from the Massachusetts standards. Such an analysis might begin by looking at the alignment between the HSCDEL F and the Massachusetts preschool standards. Creating a revised set of preschool standards then could be a metric against which alignment with the older toddler and kindergarten standards could be addressed (page 82).
- Overall, we recommend that Massachusetts revamp its standards so as to embrace the: (i) latest scientific knowledge; (ii) Common Core standards; (iii) HSCDEL F; and (iv) unique context of Massachusetts. We do not see these as mutually exclusive. Such an undertaking could be spearheaded by the Department and could build on the capacity and talent that resides therein with some external academic support. Such an effort could use state funds or could seek to commandeer private funding (pages 82-83).

III. Deliverable III: Alignment Analyses of the Massachusetts Standards for Three and Four Year Old Children and Three Assessments for the Same Age Groups

III.1. Purpose

- To examine the alignment of the Massachusetts preschool standards, which target three and four-year-olds, and three assessment instruments: (i) The Work Sampling System (Preschool-3 and Preschool-4); (ii) Teaching Strategies GOLD (Preschool 3 and Pre-K 4); and (iii) The HighScope Preschool Child Observation Record (COR). For each pair of documents (the preschool standards and an assessment for a particular

age level), alignment is assessed in terms of Balance, Coverage/Depth, and Difficulty.

III.2. Documents Used

- The Guidelines for Preschool Learning Experiences in all domains except English Language Arts and Mathematics (April 2003)
- The Curriculum Framework for English Language Arts and Literacy (March 2011): Standards for Pre-K
- The Curriculum Framework for Mathematics (March 2011): Standards for Pre-K
- The Work Sampling System: Preschool-3 Developmental Guidelines, 4th Edition
- The Work Sampling System: Preschool-4 Developmental Guidelines, 4th Edition
- Teaching Strategies GOLD: Objectives for Development & Learning, Birth through Kindergarten (2010)
- COR Observation Items, Preschool Child Observation Record, 2nd Edition

III.3. Key Findings

The findings from Deliverable III are organized into three sections below: (a) findings at the domain level (the Balance analyses); (b) findings within domains (the Coverage/Depth analyses); and (c) findings regarding the relative level of difficulty.

III.3.a. Findings at the Domain Level (the Balance Analyses)

- Many of the findings presented in this analysis of all three assessment instruments affirm our overall findings as expressed in other deliverables: Massachusetts has a solid set of standards, but could definitely strengthen them by paying more attention to the domains of Social & Emotional Development and Approaches Toward Play & Learning, as well as to the cognitive processes. In this analysis, all instruments were more attentive in general to these issues, affirming the unanimity of scientific and professional agreement regarding their importance to young children's early learning and development. (For the results that support these findings, please see the Balance analyses on pages 14-15, 33-34, and 51-52.)

III.3.b. Findings within Domains (the Coverage/Depth Analyses)

- Specifically, the preschool standards do not cover constructs in Approaches Toward Play & Learning, while one assessment devotes items at each age level to three constructs in this domain. The same assessment

at both age levels also addresses several constructs in Social & Emotional Development that the preschool standards do not. In Cognitive Development & General Knowledge, the assessment addresses the cognitive process of Representation/Symbolic Thought and the Mathematics Processes, while the preschool standards do not. These results are consistent with the results from the alignment analyses regarding Coverage/Depth between the preschool standards and the two other assessments included in the analysis. (For the results that support these findings, please see the Coverage/Depth analyses on pages 16-18, 21-23, 35-37, 40-42, 53-55, and 58-60.)

- In addition, one assessment addresses English Language Learners, whereas the Massachusetts standards do not. Clearly, there is a need for greater attention to these content areas in the Massachusetts preschool standards. (For the results that support these findings, please see the Coverage/Depth analyses on pages 18-20, 37-39, and 55-57.)

III.3.c. Findings from the Difficulty Analyses

- In terms of difficulty, the results of the comparison with two levels within one assessment suggest that the preschool standards might be better aligned with the older age level; within a second assessment, we found evidence that the standards might be better aligned with the younger age level; and within a third assessment, there was mixed evidence of alignment with the two levels included in the analyses. (For the results that support these findings, please see the Difficulty analyses on pages 24-25, 43, and 61-62.)

III.4. Key Recommendations

- Expansion of the content of the standards in the areas noted would improve alignment with all three instruments. This suggests focusing on the domains and sub-domains where standards are either missing or poorly aligned with other standards, or with the assessments that are being used. Massachusetts should not, however, begin with an assessment instrument and work backwards. Selecting one of the reviewed instruments at the outset and aligning its standards perfectly to that single instrument would be a mistake, as the instruments themselves are not perfect (page 72).
- Several strategies can be used to begin the revision process. We suggest that convening knowledgeable experts to address the domains would be helpful; such individuals should be provided with the results of our deliverables. Then, the teams should begin to refine the standards according to recent research and data. The results of the assessment

alignment presented herein should be one data tool for such revision (page 73).

- We recommend beginning the revision process with the preschool standards so that they are revised with an eye toward alignment with those of the HSCDEL and the Massachusetts standards for older and younger children, as well as with the assessment(s) that will be used. Once the alignment findings from this study are digested, the instruments should be set aside, and standards that reflect the values, goals, and aspirations of Massachusetts for its youngest citizens should be revisited (page 73).
- Following the revision of the preschool standards, Massachusetts should look at its other age groupings. It might be wise to follow the revision process of the preschool standards with a process that focuses on younger children, given that detailed data are provided in this and other deliverables for those age ranges (page 73).
- We recommend that once the content of the revised standards has been determined, that the content of each assessment should be examined for its strengths and weaknesses, and that the state should then include the instrument(s) that are most fully aligned with the standards within the assessment system. Again, we stress that we are describing an iterative process where the results of these analyses are used to revise the standards, then alignment between the standards and the assessments is reconsidered, and, after careful consideration, decisions are made regarding which assessment instrument(s) best meet the state's criteria for alignment and effectiveness (page 74).

IV. Deliverable IV: Aligning Assessments with Kindergarten Standards

IV.1. Purpose

- To examine alignment of the Massachusetts kindergarten standards and two assessment instruments: (i) Teaching Strategies GOLD (Five-year-olds and Six-year-olds); and (ii) The Work Sampling System (Five-year-olds and Six-year-olds). For each pair of documents (the kindergarten standards and an assessment for a particular age level), alignment is assessed in terms of Balance, Coverage/Depth, and Difficulty.

IV.2. Documents Used

- The Kindergarten Learning Experiences (April 2008) in all domains except English Language Arts and Mathematics
- The Curriculum Framework for English Language Arts and Literacy (March 2011): Standards for Pre-K and Kindergarten

- The Curriculum Framework for Mathematics (March 2011): Standards for Pre-K and Kindergarten
- Teaching Strategies GOLD: Objectives for Development & Learning, Birth through Kindergarten (2010)
- Work Sampling System Kindergarten Developmental Guidelines, 5th Edition (DRAFT)
- Work Sampling System First Grade Developmental Guidelines, 5th Edition (DRAFT)

IV.3. Key Findings

The findings from Deliverable IV are organized into three sections below: (a) findings at the domain level (the Balance analyses); (b) findings within domains (the Coverage/Depth analyses); and (c) findings regarding the relative level of difficulty.

IV.3.a. Findings at the Domain Level (the Balance Analyses)

- Consistent with the data reported in prior studies, the Massachusetts standards do not devote sufficient attention to Approaches Toward Play & Learning and Social & Emotional Development in kindergarten. This creates misalignment with both of the assessments. (For the results that support these findings, please see the Balance analyses on pages 15-16 and 34-35.)

IV.3.b. Findings within Domains (the Coverage/Depth Analyses)

- Moreover, given the importance of mathematics and mathematical processing, greater attention could be placed here and on the cognitive processes as well. Again, these areas of lower coverage create misalignment with both of the assessments. (For the results that support these findings, please see the Coverage/Depth analyses on pages 22-24 and 41-44.)
- In contrast to one of the assessments, the Massachusetts standards do not contain indicators that address English Language Learners, an omission that hinders the quality of standards that strive to address the learning and development of all young children in Massachusetts. (For the results that support these findings, please see the Coverage/Depth analyses on pages 19-21 and 39-41.)

IV.3.c. Findings from the Difficulty Analyses

- In the Massachusetts Arts standards, while there is good coverage of the content, both sets of assessments were coded as less difficult than the

standards in many instances. (For the results that support these findings, please see the Difficulty analyses on pages 29-30 and 48-49.)

IV.4. Key Recommendations

- When considering next steps, we suggest that standards revision should be a priority and we recommend that it be guided by the analyses represented in the suite of studies we have undertaken (pages 53-54).
- Massachusetts should embark on a standards revision process that includes revision of the standards for children from birth through (and including) kindergarten (page 55).
- Such a revision should accord significant attention to the under-addressed areas (e.g., Approaches Toward Play & Learning, Social & Emotional Development, Cognitive Processes, Mathematics Processes, and English Language Learners) (page 55).
- Massachusetts should consider the results of the Difficulty analyses in the context of its own judgment of how it envisions the ideal level of cognitive demand in the assessments relative to the standards, and how it intends to use the assessments (page 56).
- Massachusetts should continue its commitment to incorporating rigorous analyses into its programmatic plans. Having data of the sort provided in these alignment studies should be normative for a progressive state. Such data enable the wise expenditure of human and fiscal resources (page 56).