P-3 Successful Practices: A Guide to Curriculum, Instruction and Assessment

Colorado Department of Education

November 2008

COLORADO STATE BOARD OF EDUCATION

The mission of the Colorado State Board of Education is to provide all of Colorado's children equal access to quality, thorough, uniform, well-rounded educational opportunities in a safe and civil learning environment.

The Colorado State Board of Education is an elected board authorized by the Constitution of the State of Colorado with the general supervision of the public schools.

PAMELA JO SUCKLA Chairman, 3rd Congressional District
BOB SCHAFFER, Vice-Chairman, 4th Congressional District
ELAINE GANTZ BERMAN, 1st Congressional District
EVIE HUDAK, 2nd Congressional District
PEGGY LITTLETON, 5th Congressional District
RANDY DEHOFF, 6th Congressional District
JANE GOFF, 7th Congressional District

DWIGHT D. JONES, Commissioner of Education

COLORADO DEPARTMENT OF EDUCATION

The Colorado Department of Education is the administrative arm of the Colorado State Board of Education. CDE serves Colorado's 178 local school districts, providing them with leadership, consultation and administrative services on a statewide and regional basis. CDE strives to create a purpose-driven and dynamic system of educational leadership, service, and support that relentlessly focuses on the learning of all students in a way that provides:

1. Guidance and support to meet district and school needs
2. Professional development in best practices
3. Tools to eliminate gaps and increase achievement for all students
4. A seamless, collaborative leadership system with intentional intensity, urgency and impatience
5. Efficient and effective use of federal, state and private funds
6. A reliable source for research, data, and analysis envied by all professionals
7. A model for building expanded leadership capacity

ACKNOWLEDGMENTS

The Colorado Department of Education wishes to acknowledge Education Commission of the States (ECS) and Mid-continental Research for Education and Learning (McREL) for their contributions to the research review and development of this report. The Department is also appreciative of the input received from the P-20 Council's P-3 subcommittee and several other early childhood partners. This work would not have been possible without their support. The credit goes to the many contributors; any errors or omissions are the responsibility of the Department.

P-3 Successful Practices: A Guide to Curriculum, Instruction and Assessment

TABLE OF CONTENTS

I.	Executive Summary	4
II.	Introduction	6
III.	P-3 Systems Alignment	7
IV.	Curriculum, Instruction and Assessment: An Overview	7
V.	Curriculum P-3	8
VI.	Instruction P-3	16
VII.	Assessment P-3	21
VIII.	Policy Recommendations	27
IX.	Conclusion	29
X.	Appendices	30
XI.	References	34

EXECUTIVE SUMMARY

This begins with a simple truth. Children are not entitled to their starting place in life. Some enter the schoolhouse with a wealth of knowledge about numbers and print and colors. Others come with empty pockets, gnawing hunger, and little understanding of the things that contribute to success in school. Because of their birth, some find the road to school a bit steeper, the challenge greater, the odds bleaker. Because of the impoverishment of their families, the instability of their home, or for other reasons beyond their control, many enter the starting gate at a disadvantage.

To be sure, we are defined by how we react to this challenge. The gauntlet was thrown down 30 years ago when we were reminded that "our progress as a society is measured by our willingness to advance the interests of the least among us." [1]

This much is certain. We must respond. The question is how. What specifically do we do? This guide begins to provide answers to that question.

As this guide shows, we know enough to act . . . and act in ways that brighten the future for all children. By leveling the playing field, high-quality, early-childhood education can give all students a pathway to success. Benefits accrue not just to individuals but the nation. By providing a solid foundation and closing advantage gaps, education has the potential to improve the future of individuals and the nation. There is ample evidence that certain practices can help children who are developmentally disadvantaged, who lack physical, emotional and cognitive stimulation, and who are significantly more likely to struggle throughout schooling and life.

This guide stands at the intersection of research, policy, program, and practice. Its chief aim is to show how research translates into policy, policy into program, and program into practice. It examines what is known in two areas:

1) Successful curriculum, instruction and assessment practices; and
2) Systems that support effective implementation.

This guide sets out to accomplish one other aim. That is, it strives to make connections to work the state has done in this arena. [2] Findings about the need for alignment, school readiness, leadership, teacher preparation and collaboration can be found throughout this guide. It concludes with policy recommendations.

Summary of Findings

Research findings reveal that effective P-3 curriculum…

- Is comprehensive and integrated
- Acknowledges the importance of a child's social and emotional development
- Is intentional and encourages engagement
- Is evidence-based and supported by evaluation
- Is focused on clear goals and aligned to standards
- Is aligned and coordinated

Instruction that is effective in increasing P-3 achievement…

- Is based on theories of child development and sequences of learning
- Uses a variety of grouping practices based on content and student needs
- Engages students actively in their learning
- Supports development of positive teacher-student relationships
- Is teacher-directed and student-initiated

Successful P-3 assessment…

- Is ongoing and purposeful
- Is part of a larger system of accountability
- Is aligned and incorporates data-driven instruction and curriculum
- Meets high psychometric standards and relies on data that are reliable and valid for their purpose

For a complete matrix of successful practices in P-3 curriculum, instruction and assessment, see Appendix A.

Policy Recommendations

The following P-3 policy recommendations emerge:

- Develop a coherent P-3 continuum that aligns standards, instruction, and assessments;
- Identify model curricula for P-3;
- Develop a system of accountability and support that ensures increased student outcomes by third grade;
- Improve teacher preparation in ways that ensure P-3 educators can lead all young students to high levels of performance and success;
- Provide state level professional development for P-3 educators and administrators
- Create incentives to promote interagency cooperation in ways that increase effectiveness and enhance the efficiency of services to early learners;
- Identify federal, state, local and private sources of financial support and apply them to increase the access of young children to high-quality, research-based P-3 programs;
- Disseminate research on effective P-3 practices to educators, administrators, parents, community, and policy makers.

INTRODUCTION

In the face of accountability demands at home and economic competition globally, public school educators in the U.S. grapple with gaps in student performance; falling high school graduation rates; and a lack of student preparation for the workforce or higher education. In response, policymakers seek ways to create a more seamless system of education. In the words of one writer, the aim is to assure "young people's education is connected from one stage to the next." This would "reduce the chances that students [become] lost along the way or require remedial programs to acquire skills or knowledge they could have learned right from the start." [3]

Many states have widened the lens of the traditional education system by positioning formal schooling on a larger continuum that begins with preschool and progresses through college. Specifically, the preschool through third grade end of the continuum requires the collaboration of educators, policymakers, early care and education providers, health and human services and other service providers to develop a coherent framework of programs and services for young children.

"Studies show that the achievement gap is apparent long before children reach the age of five. Some children arrive in kindergarten without the ability to socialize with peers, without any practice holding a pencil and without knowing half the words of others their age. These children seldom catch up. That's the bad news." *-DPS, 2005*

The sobering reality is this. For some young children, an achievement gap exists before they enter the schoolhouse door. In particular, the language and cognition skills of young children living in poverty are often significantly lower than their peers from higher-income families.[4] Fortunately, high quality early interventions have proven successful in closing these gaps. Research shows that a consensus is emerging in curriculum, instruction and assessment practices for preschoolers, kindergarteners and children in the first years of grade school.

Nearly a decade of research and experience support the importance of sustained high quality education across the preschool-early school continuum.[5] Yet, success in stitching these together into a coherent system remains elusive. The movement to create coordinated policy aligned across separate systems has recently emerged as a critical element in comprehensive plans to improve student learning. Building on important work already in place in Colorado, this guide seeks to advance and inform our understanding of issues that are critical to the success of our youngest learners.

P-3 Systems Alignment

The alignment story begins with standards, assessment, and instruction, but it does not end there. It is necessary but not sufficient. System coherence requires more. For students to experience greater success there must be a close correspondence between other elements. This includes: teacher preparation, certification, and professional development; parent and community involvement; data systems; classroom organization; and school leadership.[6]

A common school readiness description can lay the foundation for successful early childhood transitions. Framed correctly, a school readiness description can help ease the transition into the world of formal schooling. It can do that by defining the responsibilities of the school to be ready for students who show up regardless of their background experiences or abilities. It can also describe what it takes for students to be ready for success in formal schooling. Currently, many state and federal policies are focused on improving children's readiness for school and improving teaching and learning in the early grades to ensure children's academic success at every grade level. Colorado is fully engaged in that conversation.

Curriculum, Instruction and Assessment: An Overview

While the benefits of establishing a P-3 system are clear, success in stitching the elements together remains elusive. Determining successful practices for continuity and alignment will require state policymakers and education leaders to forge new partnerships and reach consensus on the relationship between standards-based learning and developmentally appropriate practice. It will also require a re-examination of what it means to be accountable in the early childhood arena (i.e. who is responsible to whom and for what). Central to this conversation is the role of curriculum, instruction and assessment used in preschool and K-3 and how they can be aligned in a unified P-3 system.

Leadership and Vision

The challenge for state leadership is to coordinate services in a way that ensures early learners receive needed support in a comprehensive and coherent way.

The good news? Colorado is poised to meet the challenges. Research shows high quality early childhood education programs, strong parental and community involvement and alignment across the P-20 continuum have strong positive impacts. Leadership from the State Board of Education and Commissioner Dwight Jones, coupled with unprecedented collaboration among the state's early childhood and education leaders, have helped heighten awareness of the need for comprehensive policy aimed at supporting success for our youngest learners.

In 2007, Governor Bill Ritter set Colorado on a path toward a more seamless system of education by creating the P-20 Advisory Council, with a P-3 specific sub-committee. The vision for a more seamless system is articulated in the "Early Childhood Colorado Framework." Produced in July 2008, this publication provides an overview of goals, outcomes, strategies, and foundational components that together articulate a collective vision of an early childhood system (Appendix B). This document can be downloaded from: www.smartstartcolorado.org

CURRICULUM P-3

Curriculum includes the goals for the knowledge and skills to be acquired by children and the plans for learning experiences through which such knowledge and skills will be achieved.[7]

> "Curriculum is central to supporting and strengthening learning and development because it is the 'front line' of what students experience in school" -*Kagan & Kauerz, 2006*

Definitions of curriculum range from the very simple to the highly complex, and questions about the sources and purposes of curriculum have been debated and studied for years.[8] However specified, effective curricula for young learners across the P-3 spectrum provide cognitive supports and challenges that are appropriate for what research tells us children can learn and do at various ages. [9]

Eager to Learn: Educating Our Preschoolers, a review of cognitive science literature, indicates that the following principles of learning should be incorporated into any curriculum:[10]

- Teaching and learning will be most effective if curriculum engages and builds on children's existing understandings;
- Key concepts involved in each domain of preschool learning must go hand in hand with information and skill acquisition;
- Curricula that encourages children to reflect, predict, question and hypothesize effectively engages student learning.

FINDINGS FROM THE LITERATURE INDICATE THAT SUCCESSFUL P-3 PRACTICES INCLUDE CURRICULUM THAT:

- Is comprehensive and integrated
- Acknowledges the importance of social and emotional development
- Is intentional and encourages engagement
- Is evidence-based and evaluated for effectiveness
- Is focused on clear goals and aligned to standards
- Is aligned and coordinated across preschool through third grade

Effective curriculum is comprehensive and integrated

- **Preschool through third grade curricula should explicitly integrate learning across domains and disciplines.**

In the face of increased pressures to narrow the focus of curricula in the early grades to include intensive literacy and mathematics content, a persistent and growing body of knowledge supports the notion that curricula must be *comprehensive* to fully meet the learning needs and abilities of young children. [11] A comprehensive curriculum encompasses all areas of development including:

- Social-emotional development;
- Approaches to learning;
- Physical well-being and motor development;
- Language development and cognition; and
- Subject matter knowledge (science, mathematics, literacy, social studies and arts.)

Teachers need to be familiar with what children should know and be able to do in relationship to physical, social, emotional and cognitive development, and across disciplines, including how learning and development in one domain impacts that in other domains.[12] For example, a comprehensive curriculum addresses mastery of knowledge about key concepts of subject matter while simultaneously addressing differentiated approaches to learning.[13] And, while research suggests literacy and numeracy skills represent critical components of school readiness, these components are necessary but insufficient elements of the curriculum.[14]

Studies of effective curricula must address an array of intertwined and interrelated questions and identify the conditions under which certain curricula work best for certain children. Specifically, these questions must ask which approaches produce educationally meaningful effects, in which domains of development, for which children, under what social conditions, and with what kinds of professional preparation for teachers.[15] Overall, what research reveals is this. Effective curricula must rely on a balance between a clearly defined framework for all learners and flexibility that allows for individualization for learners, teachers, and classrooms.

Push Down

"Push-down" refers to the trend for early childhood classrooms to adopt curricula, standards and practices that are reflective of K-12 standards which focus heavily on core academic content areas such as math, reading, science, and social studies. This goes to the heart of an important question. What is, or what should be, the relationship between standards and developmentally appropriate practice?

Well-respected organizations like NAEYC have resolved this question in the following way; it is appropriate to set standards for our youngest learners, however, those standards should reflect developmentally appropriate knowledge and skills. Caution should be taken to ensure that an increasing emphasis on academic instruction in preschool and kindergarten classrooms does not result in practices that ignore the full spectrum of developmental needs of young children.[1, 2]

While there is agreement on the importance of early childhood standards, they go beyond content standards to: 1) address non-academic skills like attention, decision-making, and motor control that prepare kids for kindergarten and beyond, 2) accommodate individual differences, and 3) address core developmental progressions across social-emotional, cognitive, language, and physical spectra.

Early childhood curricula, standards and practices need to address the unique developmental needs of our youngest learners. While critical language, literacy and numeracy skills can develop as early as preschool, early childhood curricula must provide approaches to learning that engage and support children with diverse backgrounds and needs.

[1] Kendal, J.S. (2003). *Standards and early learning*. Educational Leadership, 60 (7), 64-68.
[2] Bodrova, E., Leong, D. and Shore, R. (2004, March). *Policy Matters,5*. National Institute for Early Education Research.

Effective curriculum acknowledges the importance of a child's social and emotional development

- **Social-emotional development has been shown to have a lasting impact on children's later academic achievement outcomes and should be a key element in effective, comprehensive early childhood curricula.**

Economist and Nobel Laureate, Dr. James J. Heckman, speaks widely on the economic reality that investing in our youngest children produces the highest rate of return, especially for children with significant risk factors in their lives. Dr. Heckman and others continue to show that social/emotional factors – such as motivation, self-control, self-esteem, and perseverance – have a direct effect on wages, health, performance on achievement tests, crime, teenage pregnancy, and other aspects of social and economic life.[16] In short, evidence suggests that providing curriculum that supports social/emotional development has a positive and long lasting impact.[17]

"Analysts at the Federal Reserve and economists who have studied the financial impact of ECE have concluded that a $1 investment in ECE results in anywhere between $4 and $12 of public tax savings down the road – a result of lower demand for social services, reduced crime rates and greater tax payments by the higher wage earning ECE recipients"
-DPS, 2005

Effective curriculum is intentional and encourages engagement

- **Curricula should provide a clear progression of concepts to be taught allowing the teacher to identify where students need intervention or acceleration**

Children at the early end of the P-3 continuum vary widely in rates of development. Curricula must intentionally introduce concepts in a developmental progression. Latitude is needed so teachers may tailor curriculum experiences to the developmental capacities and interests of children.

Curriculum that engages children's preconceptions about basic concepts provides a critical foundation upon which to build new knowledge and understanding.[18] When children are provided with opportunities to explore their interests and participate in making choices, motivation and engagement increase.

Effective curriculum is evidence-based and supported by evaluation

- **When selecting curricula, ensure that content is validated by research and there is evidence that implementation results in positive outcomes for young children.**

While it is widely accepted that curriculum should be based on research and evaluated for effectiveness, the results are mixed.[19] The National Research Council (2001) warns that a piecemeal approach can result in disconnected activities and teaching methods that lack focus, coherence, and/or comprehensiveness.

A body of longitudinal evidence documents the long-term positive effects of some specific curriculum models. Positive results have been demonstrated for curricula that emphasize the importance of a child-centered or child-initiated approach.[20] Benefits have been associated with curriculum that has incorporated careful planning, sound implementation, and which has linked learning into a coherent whole.[21]

There is reason for caution. Not all early childhood curriculum has been shown to promote greater student learning. For instance, a recent study conducted by the Institute of Education Sciences evaluated 14 commonly used preschool and kindergarten curricula.[22] It found that most did not effectively impact student and classroom level outcomes (Appendix C). It is clear that additional research is necessary to identify the essential elements of effective preschool and kindergarten curricula.

Fade-Out

"Fade-out" describes a behavior observed in some children whereby early gains made in preschool and kindergarten dissipate rapidly once students enter grade school.

The question for educators is, is fade-out a myth or a reality?

Evidence shows that some programs do produce large gains in the short term in cognitive development, math, and reading.[1] However, other research shows that the boost from preschool education dissipates as early as first grade and can be completely eliminated by third.[2]

What accounts for a quick erosion of skills in some students? Researchers point out these results do not necessarily mean that early childhood programs are ineffective. Quite the contrary: some early childhood programs are effective. Rather, researchers point to other potential explanations for the fade-out phenomenon, such as:

- The quality of an early childhood program—and the methodology of studies on such programs—make a huge difference. If you separate high-quality programs and rigorous studies from low-quality programs and undemanding studies, the high-quality programs and rigorous studies show little fade-out.[3]
- The misalignment of standards and curriculum between kindergarten and grades one through three disrupts learning. A reformed P-3 system, they argue, would likely regenerate the initial preschool "boost."[4]

This much is certain. Findings from the Perry Preschool study, a major 40-year undertaking, present convincing evidence that participation in high-quality preschool programs has significant long-term benefits in a variety of outcomes, including 44% higher graduation rate, 50% fewer teen pregnancies, 33% lower arrest rate for violent crimes, 42% higher median income, and 26% less dependency on government assistance.[5]

The North Carolina Abecedarian Project, another long-term study, demonstrated that poor children in preschool programs, compared to those who did not experience preschool, achieved better academic performance through high school, enhanced cognitive and language development, and greater likelihood to attend a four-year college.[6]

Moreover, a recent meta-analysis of research on early childhood education showed that in the long-term, young children in high-quality programs had higher social-emotional, cognitive, and language skills, higher achievement test scores, higher rates of educational attainment, and lower rates of grade repetition and special education.[7]

[1] Magnuson, K. A., Meyers, M. K., Ruhm, C. J., & Waldfogel, J. (2005). Inequality in children's school readiness and public funding. *Focus, 24*(1), 12-18.
[2] Rathbun, A., West, J., & Hausken, E. G. (2004). *From kindergarten through third grade: Children's beginning school experiences* (No. NCES 2004-007). Washington, DC: U.S. Department of Education, National Center for Education Statistics.
[3] Barnett, W. S. (2008). Preschool education and its lasting effects: Research and policy implications. Boulder and Tempe: Education and the Public Interest Center & Education Policy Research Unit. Retrieved from http://epicpolicy.org/publication/preschooleducation.
[4] Kauerz, K. (2006). *Ladders of learning: Fighting fadeout by advancing PK-3 alignment*. Washington, DC: New America Foundation.
[5] Schweinhart, L. J., Montie, J., Xiang, Z., Barnett, W. S., Belfield, C. R., & Nores, M. (2005). Lifetime effects: The High/Scope Perry Preschool study through age 40. Ypsilanti, MI: High/Scope Press.
[6] Campbell, F. A., Ramey, C. T., Pungello, E., Sparling, J., & Miller-Johnson, S. (2002). *Early childhood education: Young adult outcomes from the Abecedarian project*. Applied Developmental Science, 6(1).
[7] Barnett. 2008.

Effective curriculum is focused on clear goals and aligned to standards

- **When the goals and objectives for what learners should know and be able to do are articulated in terms of developmental expectations or content standards, teachers have a clear roadmap to follow.**

Effective curricula are aligned with clear performance standards and developmental progression. Many scholars and researchers today believe curricula have become "a mile wide and an inch deep" as a result of presenting too many isolated facts without the associated context.[23] The outcome is a lack of coherence and insufficient scope and sequence within the curriculum. The result is that students lack depth of skill and the understanding needed for student mastery.[24]

Findings from research on curricula in specific content areas (e.g., math, literacy and science) illustrate the need for more clear articulation of goals and objectives and movement away from including too much content at any given level. For example:

- The National Math Advisory Panel (2008) states that math curriculum for the early grades should be "streamlined" to emphasize a well-defined set of critical topics and represent a coherent progression of learning as opposed to revisiting the same topic in a cursory way over multiple years. The National Council of Teachers of Mathematics (NCTM) developed *Curriculum Focal Points,* which identifies a small number of math "targets" for each grade level and calls for an emphasis on processes such as communication, reasoning, representations, making connections and problem solving.

- The National Research Council and the National Reading Panel identify essential early reading content which has the greatest impact on later achievement.[25, 26] These essential components include phonemic awareness, phonics, fluency, vocabulary and text comprehension. The NRC publication *Preventing Reading Difficulties in Young Children* outlines a continuum of research-established benchmarks for literacy development for three- and four-year-olds, kindergarteners, first graders, second graders and third graders.[27]

- The science education community voices similar concern over the broad and often disconnected array of science topics addressed in elementary schools. The National Association of Elementary School Principals listed the following concerns about K-8 science curricula: important unifying themes are getting lost in favor of broad concept coverage; too much variation in implementation of standards is creating a disjointed framework of science teaching and learning, putting some students at risk of missing key concepts; and the practice of using modular units in isolation means students are jumping from one topic to the next, working against a coherent learning sequence that builds one foundational concept upon another.[28]

Effective curriculum is aligned and coordinated

- **Alignment of curriculum from preschool through third grade supports a progression of learning, building on prior knowledge and skills.**

The goal of a P-3 curriculum should be to create a coordinated continuum of learning. Key elements include curriculum that is:[29]

- Aligned across all levels of learning
- Sequenced and based on research findings regarding development and learning
- Coordinated across grade levels to assure better outcomes (e.g. what happens in first grade reading is based on what was learned in kindergarten and what will be learned in second grade)
- Tied to content standards for preschool through third grade

INSTRUCTION P-3

Instruction consists of the means educators use to share knowledge and inspire learning. P-3 classrooms contain learners whose abilities span a greater spectrum than that found in the classrooms of older students. Skills are changing daily in the early grades.

One of the unique features of instruction at this level is how developmental characteristics of young children affect learning and how understanding of those characteristics translates into instructional strategies.

"In developmentally appropriate practice, it is the teacher who takes responsibility for stimulating, directing and supporting children's development and learning by providing the experiences that each child needs to acquire important knowledge and skills" *-NAEYC, 2008*

Good teaching promotes student engagement. It does so by requiring a high level of responsiveness from students. For this to occur, a teacher must have deep knowledge of content and a keen understanding of the sequences of learning.[30] Research conducted in a variety of classrooms within a single school found that the same curriculum can look very different in different classrooms as a result of how the teacher delivers information and what instructional strategies are used.[31]

RESEARCH ON EFFECTIVE INSTRUCTION REVEALS THAT P-3 SUCCESSFUL PRACTICES INCLUDE INSTRUCTION THAT:

- Is based in theories of child development and sequences of learning
- Uses a variety of grouping practices based on content and student needs
- Engages students actively in their learning
- Supports development of positive teacher-student relationships
- Is both teacher-directed and student-initiated

Effective instruction is based in theories of child development and sequences of learning

- **Essential knowledge for effective instruction involves an understanding of child development, variability in how children learn and techniques that match individual differences.**

With respect to the skills needed by those who teach young children, research indicates that deep knowledge of content and knowledge of how children learn are essential.[32] Familiarity with typical sequences of learning and common learning challenges is necessary to effectively teach concepts and make instructional adjustments.[33] When teachers recognize the development of each individual child, scaffolding, supporting a child to go just beyond their current capability, can be used to extend a student's competence in all areas.[34]

Effective instruction uses a variety of grouping practices based on content and student needs

- **The use of small group instruction in early education classrooms positively impacts achievement with significant gains demonstrated in language development, oral comprehension and children's active engagement in learning.**

Preschool programs have traditionally used small group instruction as one of a number of learning formats. Small groups provide greater opportunities for children to engage in quality interactions with teachers and peers, as well as increased possibilities for teachers to successfully scaffold children's learning (i.e., provide enough assistance to enable each child to experience success on tasks just beyond their individual ability, then gradually reduce the support as the child gains independent mastery of the skill.[35] Effective small group instruction is teacher-led and is differentiated based on the instructional needs of students. Students are regrouped as their instructional needs change. Explicit instruction for groups of six or fewer students that have similar instructional needs has been found to be as effective as one-to-one instruction.[36]

While the benefits of small group instruction on student learning have been proven, grouping strategies are typically underused and ineffectively implemented. Teachers tend to utilize small group instruction without first identifying the specific concepts or skills that will be taught. However, emerging assessment and instructional methodologies, along with supporting technologies, have significantly reduced time and effort required to identify student needs and group students for instruction.[37]

Recent Research Lessons: Instructional Practices Involving Young Children

In the last 10 year the U.S. has commissioned several national literacy studies. One culminated in 1998 with the publication of *Preventing Reading Difficulties in Young Children.* Another of these studies led to the release of the *Report of the National Reading Panel: Teaching Children to Read* in 2000. A third in the series is forthcoming. Recently undertaken by the National Early Literacy Panel (NELP), it picks up where previous studies left off. Like these earlier studies, it sought to identify particular instructional practices that promote literacy. However, its unique focus was on literacy in young learners or those to age 5.

Broadly based, this meta-analysis (i.e., a study of all studies) started with 8,000 articles. This was narrowed to research-based papers. These 500 papers were placed in two categories. One category involved studies using correlational data. The other category involving studies using experimental data. Still in press, the NELP report is expected to produce a few clear themes.

Before identifying these themes, a word of explanation is in order. Colorado has strong ties to those who undertook this recent work by NELP. For instance, the chair of the National Early Literacy Panel, Tim Shanahan, is also a member of the Colorado Literacy Council. While the NELP report was in press at the time that this *P-3 Successful Practices Guide* was published, discussions that Colorado educators have had with Dr. Shanahan have made preliminary results from that study available.

<u>Strong predictors of literacy for preschool- and kindergarten-age children</u> With respect to instructional practice, six areas have been shown to be precursors of literacy for young learners:

1. Alphabetic knowledge
2. Phonological awareness
3. Rapid automatic naming of letters or digits
4. Rapid automatic naming of objects or colors
5. Name writing
6. Phonological memory

<u>Moderate predictors of later literacy for preschool- and kindergarten-age children</u> In addition, five other areas emerged as important precursors of later literacy. These include:

1. Concepts about print
2. Print knowledge
3. Reading readiness
4. Oral language
5. Visual processing

Effective instruction engages students actively in their learning

- **Academically engaging classrooms are those where students actively participate in learning activities.**

Long a high priority in early childhood classrooms, Pressley (2002) found that highly effective teachers in elementary schools created classrooms that provided an array of engaging materials and opportunities for students to interact. Additional instructional practices that contribute to active student engagement and enhanced learning include:[38]

- Teachers incorporate a wide variety of materials, equipment and teaching strategies to accommodate the range of children's individual differences in development, skills and abilities, prior experiences, needs and interests.
- Teachers intentionally arrange meaningful experiences that are intellectually and creatively stimulating, invite exploration and investigation and engage children's active, sustained involvement.
- Teachers organize daily and weekly schedules to provide children with extended blocks of time to engage in sustained play and interaction with adults and peers.
- Teachers include all children in all classroom activities and encourage children to be inclusive in their behaviors and interactions with peers.

Effective instruction and interaction styles support development of positive teacher-student relationships

- **The more quality contact children have with competent adults, the greater the impact on both cognitive and social-emotional development.**

A recurring theme in addressing instructional strategies employed by teachers in the early grades is "relationships matter." Good teaching is reciprocal, teachers learn about teaching from their students.[39] Research has found that young children who get along well with their teachers are more engaged in classroom activities and learn more than their peers.[40]

Certain instructional practices support student learning and social-emotional development. These include: frequent meaningful interaction such as conversations and open-ended questions with children; teaching important concepts through projects and active engagement; and the use of regular assessment and observation to inform instruction.[41]

While the importance of high quality instructional interactions is widely accepted, a recent study by Hamre and Pianta (2007) found that the most common instructional strategies in preschool and early grade classrooms were not always supportive of student learning. The study found that:

- Emotional support was ranked moderate to high in classrooms (this is noteworthy because positive relationships in early grades have been shown to positively impact academic trajectories).
- Low levels of instructional support were prevalent. The authors found that:
  - Teachers were inconsistently engaging children in interactions that encouraged higher order thinking, reasoning or advanced language skills.
  - Children were given few opportunities to brainstorm or integrate new learning into what they had already learned.
  - Feedback focused on the correctness of responses, doing little to expand learning.
  - Teachers generally did not interact in ways that extended language – they seldom asked open-ended questions that required elaborated responses.
  - Overall, there was a wide variety in both emotional and instructional support across classrooms and levels.

Effective instruction is teacher-directed and student-initiated

- **Explicit instruction is an efficient and effective way to teach students new skills and concepts. The independent ability to apply knowledge and skills increases with student development.**

A significant body of research concludes that direct, intentional, systematic and explicit instruction is effective in increasing language, literacy, and numeracy skills in preschool through third grade students.[42] In order for students to learn, teachers need to actively engage preconceptions and identify and directly address misconceptions.[43]

However, this approach loses its effectiveness as student understanding deepens. Once students reach a level of mastery, cognitive approaches to learning should be used to expand students' application of knowledge and skills and encourage divergent thinking.[44] As students' cognitive skills develop, students learn more by thinking critically and reflecting on their thinking.[45]

ASSESSMENT P-3

With the rise in public investments in programs for young children before they enter school and expectations on schools that children attain proficiency by third grade, it is no surprise that accountability has become an important issue for early learning educators and policymakers.

"Most importantly, any assessment practices in programs serving children in prekindergarten through grade three must be carried out in ways that bring benefits to children" -*Epertson, 2008*

Assessment can be defined as the measurement activities used to determine what students have learned and can do. Assessment is important in deciding which curriculum goals need to be addressed, how instructional strategies can be matched to student capabilities and whether or not a particular sequence of instruction has been successful.[46]

LITERATURE ON EFFECTIVE ASSESSMENT REVEALS THAT P-3 SUCCESSFUL PRACTICES INCLUDE ASSESSMENT THAT:

- Is ongoing and purposeful
- Is part of a larger system of accountability
- Is aligned and incorporates data-driven instruction and curriculum
- Meets high standards of psychometric properties and data is validated and reliable

Effective assessment is ongoing and purposeful

- **Everyday classroom assessment, including formal and informal data, is essential for guiding instructional decisions that result in increased student achievement.**

"Doing assessment well is difficult and designing assessment systems that serve the purpose of ensuring optimal outcomes for young children requires the investment of time, money and considerable expertise. Failing to make those investments risks negative effects on children, on those responsible for care and education of young children and ultimately on society" -*Snow & Van Hemel, 2008*

The primary purposes of educational assessment are to monitor student achievement and guide instructional decisions.[47] Ongoing observations contribute to a process of gathering information in the context of everyday classroom activities to obtain a representative picture of children's ability and progress. Ongoing assessment can be a manageable and dynamic process when it is directly linked to instruction and curriculum.[48]

Data from assessments can be collected in a variety of ways, including teacher observations, documentation of what children do and say over time, collecting samples of children's work, talking with children about what they are doing and thinking, etc. Assessments are connected to the curriculum goals and objectives and provide a tool for teachers to measure how well children are progressing on particular aspects of the curriculum. "Teachers need to see assessment as part of their jobs, as part of their own feedback process so they know how to help [children]."[49]

Research has shown that when assessment is part of a comprehensive system including curriculum and instruction at the preschool level, children tend to be better prepared and perform better on measures of both academic and social ability.[50]

Effective assessment is part of a larger system of accountability

- **Accountability includes standard-based assessments of children's development and learning and program quality designed to inform state policy decisions.**

Anticipating what many are calling (and fearing) an "accountability driven culture" in the early elementary grades, the National Early Childhood Accountability Take Force was formed in 2005 to address issues of accountability and appropriate assessments for young children. In its report titled "Taking Stock: Assessing and Improving Early Childhood Learning and Program Quality," the Task Force defined an effective accountability system as "a system of standards-based assessments of children's development and learning and program quality designed to inform state policy decisions, investments and improvement efforts for three- and four-year old children, linked to a continuum of kindergarten through third grade standards, curriculum, assessments and program improvements."

Research that looks at the quality of the educational programs in the early grades makes a case for assessing program quality, as well as student achievement, to measure of school performance. This position is supported by evidence that positive classroom quality as measured through teacher-student interactions and relationships indeed impacts student achievement.[51] Young children's performance on assessments is influenced by context. For example, a child's score on a vocabulary test reflects not only their capacity to learn words but also their ease with testing procedure and relationship with the tester.[52] The younger the child, the more important these considerations.

Assessment of young children's learning and development in schools should be part of a coherent interagency assessment system including assessments conducted by medical and family service providers.[53]

What does a larger system of accountability look like?

Standards	A comprehensive, well-articulated set of standards for both program quality and children's learning that are aligned to one another.
Assessments	Multiple approaches to documenting child development and learning and reviewing program quality.
Reporting	Maintenance of an integrated database of assessment instruments and results (with appropriate safeguards of confidentiality) that is accessible to potential users.
Professional Development	Ongoing opportunities provided at all levels (policy makers, program directors, assessment administrators, practitioners) to understand the standards and the assessments and learn to use the data and reports with integrity.
Inclusion	Methods and procedures for ensuring all children served by the program will be assessed fairly, regardless of their language, culture or disabilities and with tools that provide useful information for fostering their development and learning.
Monitoring and Evaluation	Continuous monitoring of the system itself to ensure it is operating effectively and that all elements are working together to serve the interests of the children.

A Statewide System of Support

Families with young children – especially those facing multiple economic, cultural or linguistic barriers – benefit when early childhood programs address the comprehensive needs of children and families. It is imperative that policies be established at the classroom, community and state levels to support the delivery of comprehensive and coordinated services so that young children can reach their full learning potential and families can thrive.[1]

State Collaboration

- States, local governments and other interagency coordinating bodies should establish policies that require coordination of comprehensive services at the community level (such as education, health, nutrition, mental health, family support) to enhance access to needed services for children and their families. Policies must outline a process for the exchange of information across systems and privacy protections.[2]
- States, local governments, and other interagency coordinating bodies should provide for ongoing channels of communication among early childhood programs and schools in order to enhance the continuity of developmentally appropriate standards, curricula, assessments, and services for all children. Such open communication and intentional collaboration can ensure that as the children move from one program to another, year to year and within the day, the care and education they receive is additive and yields compounding benefits.[3]

Community Collaboration

"It's easy to understand why systems *that incorporate diverse sites are so popular. They hold the promise of accomplishing many critical goals at once, including broader access, faster start-up time, more efficient use of public and private investments, and improved quality across all settings."*[4]

High-quality preschool can be found in a variety of settings, including public schools, public and private child care centers, and Head Start Programs. Utilizing diverse preschool settings is referred to as a "mixed delivery" system.[5] Community partners are a critical link in the delivery of a high quality preschool program and should be seen as key partners in the development of a P-3 system. When a preschool system collaborates with community partners, traditional barriers between early education and child care policies break down and the needs of children in working families are addressed in a coordinated way.[5] The system can also strengthen the quality of community-based child care programs.[7]

[1] National Association for the Education of Young Children. (Adopted 2009). NAEYC Position Statement: Developmentally Appropriate Practice in Early Childhood Programs Serving Children from Birth through Age 8, 3rd edition.
[2] NAEYC, 2009.
[3] NAEYC, 2009.
[4] Holcomb, Betty (2006), "A Diverse System Delivers for Pre-K: Lessons Learned in New York State". (Pre-K Now Research Series, available at http://www.preknow.org/documents/DiverseDelivery_Jul2006.pdf)
[5] Rachel Schumacher et al., "All Together Now: State Experiences in Using Community-Based Child Careto Provide Pre-Kindergarten," in *Creating a National Plan for the Education of 4-Year-Olds* (Washington, DC: Center for Law and Social Policy, 2005).
[6] Rachel Schumacher et al., "All Together Now."
[7] Rachel Schumacher et al., "All Together Now."

Effective assessment is aligned and incorporates data-driven instruction and curriculum

- **Assessment must be linked to what children are learning and teachers are teaching in their classrooms.**

There is growing concern today that assessments being used in schools and programs do not necessarily match what students are being exposed to through their curriculum and instruction. To authentically measure student outcomes, assessments must be aligned with content and outcome standards, curriculum and instruction. The use of student data to inform instruction is further enhanced when assessments are aligned across learning levels preschool through third grade. Finally, assessments selected must match or be appropriate for the population of students being assessed.[54] These issues are addressed in both national reports on assessment and accountability systems discussed in this guide.

Currently, a number of education leaders are voicing concern about the mounting escalation of accountability pressures being imposed on educators at all levels. There is a growing demand for credible evidence that public dollars are being well invested in programs and teachers. The source of this evidence continues to lie in measures of student achievement on test scores. In other words, "assessment evidence is now being employed by both educators and non-educators to determine whether curriculum and instruction are effective. As never before, the testing tail is definitely wagging the curriculum/instruction canine."[55]

This issue is particularly concerning to educators of young children where issues regarding the uneven trajectories that development and learning take with young children, and the appropriateness of using test scores to measure program effectiveness in the first place are ongoing. Teachers — particularly teachers of preschool children — have long used ongoing assessment as a means of tracking progress and informing their instruction. The issue now is that high stakes decisions about program support are tied to assessments that are not necessarily linked closely to what children are learning and teachers are teaching in their classrooms.

Building and defining a coherent assessment system

- *Horizontal coherence* – curriculum, instruction and assessment are aligned with early learning and development standards
- *Vertical coherence* – shared understanding exists at all levels of the system about the goals for children's learning and development that underlie standards, as well as consensus about the purposes and uses of assessment
- *Developmental coherence* – considers how children's skills and understanding develop over time, as well as the content knowledge, abilities and understanding that are needed for learning to progress at each stage of the process. -*Snow & Van Hemel, 2008*

Effective assessment meets high psychometric standards and relies on data that are reliable and valid for their purpose

- **Systems must reflect the highest standards of evidence with respect to psychometric properties, evidence supporting the appropriateness for the population and domains that serve as the focus of the assessment.**

Where assessments are being used for the purposes of program evaluation and accountability, outcomes can have major consequences for children, their families and their communities. Given these stakes, systems must reflect the highest standards of evidence with respect to:[56]

- Psychometric properties
- Evidence supporting appropriateness for the population
- Domains serving as the assessment's focus

In addition to assuring that the actual assessment measures meet the highest standards, it is important for decision-makers to address the following considerations in choosing an assessment:

- The purpose of the assessment and the domains of learning or development that will be assessed
- The best and most appropriate assessment measure for that purpose and domain
- How to implement the measure appropriately
- How to assure the assessment represents a larger system of services and supports [57]

POLICY RECOMMENDATIONS

THE POLICY RECOMMENDATIONS LISTED BELOW WILL HELP COLORADO INITIATE AND IMPLEMENT THE P-3 INITIATIVE IN WAYS THAT WILL LEAD TO ITS INSTITUTIONALIZATION AND CONTINUOUS IMPROVEMENT.

- **Develop guidelines for a coherent, aligned P-3 continuum that addresses standards, instruction and assessments**
  - Develop a well-articulated set of P-3 grade-by-grade model state standards
  - Identify model assessment practices that inform instruction including the selection and implementation of valid and reliable assessments

- **Identify model curriculum for P-3**
  - Identify and develop model curricula that delineate the developmental progression of knowledge and skills

- **Improve teacher preparation in ways that ensure P-3 educators can lead all young students to high levels of performance and success**
  - Revise preparation standards for early childhood and elementary education endorsements to ensure teachers have the knowledge and skills to meet the learning needs of P-3 students
  - Revise preparation standards for principals to include knowledge of early development and research-proven P-3 practices
  - Ensure teachers preparation standards align with research-proven practices and model content standards for students

- **Develop a system of accountability and support that ensures increased student outcomes by third grade**
  - Identify effective preschool and elementary school curriculum, instruction and assessments using existing data from Results Matter, CBLA and CSAP academic growth calculations and other sources
  - Include all children, including English language learners and students with disabilities, in P-3 accountability
  - Study the effects of high quality preschool programs on student progress from preschool through third grade
    - Create a system of student identification numbers that begin in preschool, continue in kindergarten and link to teacher identification numbers
    - Identify valid and reliable formative assessment tools for preschool through third grade on a variety of indicators
    - Identify or create classroom observation tools for evaluating implementation practices
    - Identify incentives for P-3 programs to participate in program effectiveness research

- **Provide state level professional development for P-3 educators and administrators including**
  - Research on effective P-3 curriculum, instruction and assessment
  - Developmental progression of knowledge and skill acquisition
  - Using data to inform instructional decisions and monitor student progress
  - Selecting and implementing curriculum and assessment tools

- **Create incentives to promote interagency cooperation in ways that reduce redundancies, increase effectiveness and enhance efficiency of services to early learners**
  - More clearly articulate the roles, responsibilities and interdependency of government agencies that work in the early childhood arena

- **Identify additional federal, state, local and private sources of financial support to increase access to high-quality, research-based P-3 programs**
  - Grant funding and other incentives for implementation of effective curriculum, instruction and assessment practices
  - Grant funding and other incentives for providing P-3 educators with research-based professional development
  - Programs to create equitable compensation for early childhood educators

- **Disseminate research on effective P-3 practices to educators, administrators, parents, community and policy makers**
  - Develop a state website for P-3 resources
  - Print and disseminate reports on P-3 successful practices
  - Host research forums on P-3 successful practices

CONCLUSION

There is widespread agreement that the early years are critical to children's development. Yet, in spite of that widespread agreement, many children enter school already behind.

The good news is this. Evidence shows that in the early childhood arena there are particular aspects of curriculum, assessment and instruction that can help all children experience greater success once they enter their years of formal schooling. What is encouraging is that these practices are most beneficial to those most in need of help. This includes those who are developmentally disadvantaged, those who lack physical, emotional and cognitive stimulation and those who are significantly more likely to struggle throughout schooling and life.

To be sure, the task of meeting the needs of our youngest learners does not fall solely on schools. Yet, while schools cannot do it all, they can help bring it all together for young people. Certainly, schools bear a special responsibility when it comes to supporting our early learners. That responsibility has a moral foundation. No matter what students bring with them to school, the goal of school is "to see that children get the opportunity to escape the limitations of the social group in which they were born."[58]

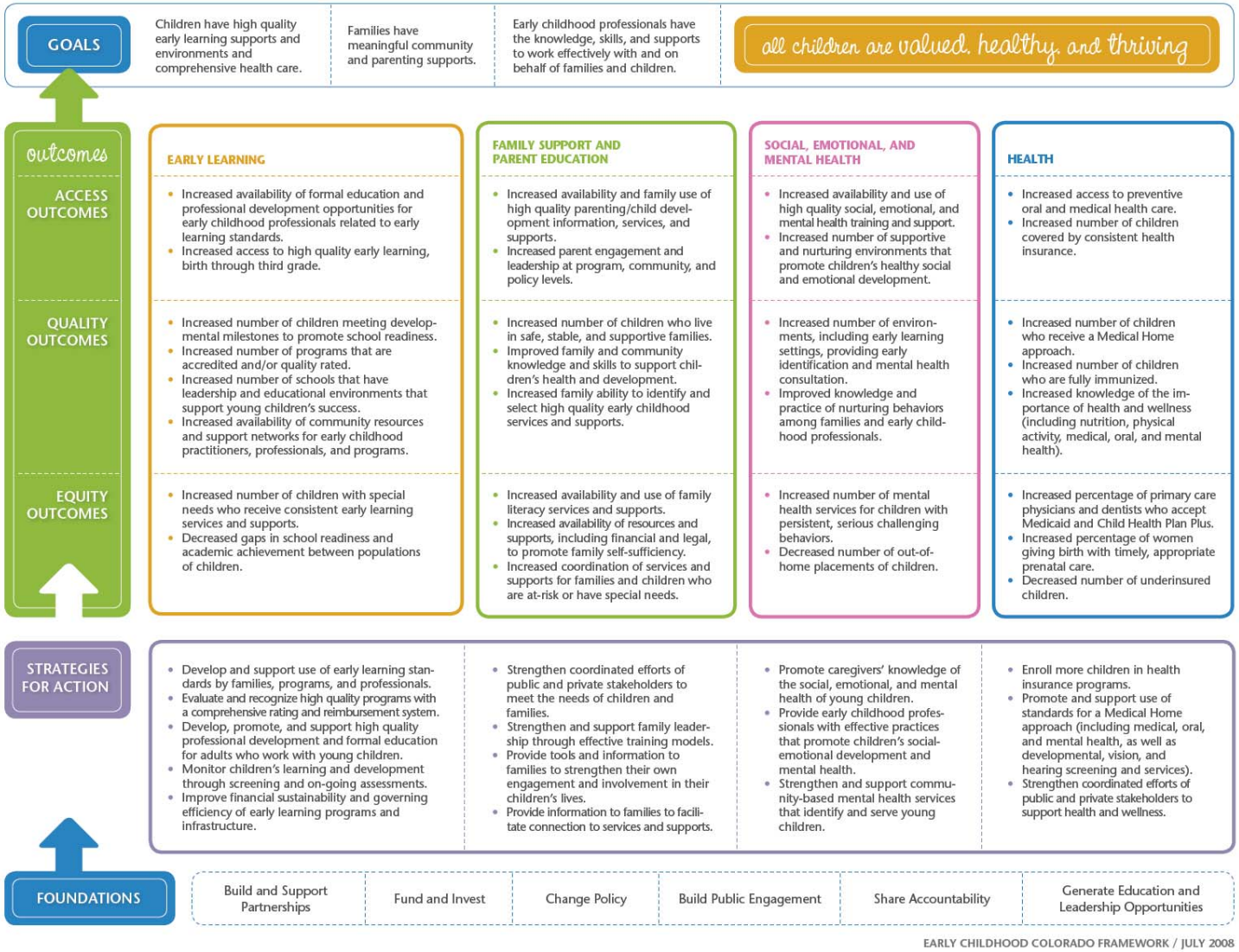
Even though we recognize as a society that the earliest years of education provide a critical foundation for children's learning and development, too many children begin their lives with the odds against them. This guide will have achieved its aim if it informs, shapes and improves the practices of those entrusted with the care of our youngest learners.

Finally, additional research on the effectiveness of systems for P-3 education is needed that evaluates multiple components including: standards, assessments, curriculum, instruction, as well as variables such as cost, teacher credentials, school readiness indicators and leadership characteristics.[59]

Appendix A: Summary of Findings

Research findings reveal that effective P-3 curriculum…	
Is comprehensive and integrated	Preschool through third grade curricula should explicitly integrate learning across domains and disciplines.
Acknowledges the importance of a child's social and emotional development	Social-emotional development has been shown to have a lasting impact on children's later academic achievement outcomes and should be a key element in effective, comprehensive early childhood curricula.
Is intentional and encourages engagement	Curricula should provide a clear progression of concepts to be taught allowing the teacher to identify where students need intervention or acceleration.
Is evidence-based and supported by evaluation	When selecting curricula, ensure that content is validated by research and there is evidence that implementation results in positive outcomes for young children.
Is focused on clear goals and aligned to standards	When the goals and objectives for what learners should know and be able to do are articulated in terms of developmental expectations or content standards, teachers have a clear roadmap to follow.
Is aligned and coordinated	Alignment of curriculum from preschool through third grade supports a progression of learning, building on prior knowledge and skills.
Instruction that is effective in increasing P-3 achievement…	
Is based on theories of child development and sequences of learning	Essential knowledge for effective instruction involves an understanding of child development, variability in how children learn and techniques that match individual differences.
Uses a variety of grouping practices based on content and student needs	The use of small group instruction in early education classrooms positively impacts achievement with significant gains demonstrated in language development, oral comprehension and children's active engagement in learning.
Engages students actively in their learning	Academically engaging classrooms are those where students actively participate in learning activities.
Supports development of positive teacher-student relationships	The more quality contact children have with competent adults, the greater the impact on both cognitive and social-emotional development.
Is teacher-directed and student-initiated	Explicit instruction is an efficient and effective way to teach students new skills and concepts. The independent ability to apply knowledge and skills increases with student development.
Successful P-3 assessment…	
Is ongoing and purposeful	Everyday classroom assessment, including formal and informal data, is essential for guiding instructional decisions that result in increased student achievement.
Is part of a larger system of accountability	Accountability includes standard-based assessments of children's development and learning and program quality designed to inform state policy decisions.
Is aligned and incorporates data-driven instruction and curriculum	Assessment must be linked to what children are learning and teachers are teaching in their classrooms.
Meets high psychometric standards and relies on data that are reliable and valid for their purpose	Systems must reflect the highest standards of evidence with respect to psychometric properties, evidence supporting the appropriateness for the population and domains that serve as the focus of the assessment.

Appendix B: EARLY CHILDHOOD COLORADO FRAMEWORK



EARLY CHILDHOOD COLORADO PROVIDES A FRAMEWORK THAT:

- Recognizes the needs of the whole child and family.
- Communicates the vision for comprehensive early childhood work.
- Focuses on specific measurable outcomes.
- Guides, organizes, and focuses the actions and accountability of public and private stakeholders.

THIS WORK IS GUIDED BY THE FOLLOWING PRINCIPLES:

- Be child-focused and family-centered.
- Recognize and respond to variations in cultures, languages, and abilities.
- Use data to inform decisions.
- Build on strengths of communities and families.
- Focus on children from birth to age 8.
- Promote partnerships.
- Act at state, local, and statewide levels.

For more information contact Early.ChildhoodTeam@capitol.state.co.us.

Early Childhood Colorado Framework

A COLLECTIVE VISION ON BEHALF OF COLORADO'S YOUNG CHILDREN AND THEIR FAMILIES.

KEY LEADERS FROM THE FOLLOWING EARLY CHILDHOOD GROUPS REVIEWED AND SUPPORT THE EARLY CHILDHOOD COLORADO FRAMEWORK:

Aloha Foundation
American Academy of Pediatrics, Colorado Chapter
Blue Ribbon Policy Council
Chambers Family Fund
Clayton Early Learning
Colorado Association for the Education of Young Children
Colorado Bright Beginnings
Colorado Children's Campaign
Colorado Department of Education
Colorado Department of Health Care Policy and Financing
Colorado Department of Human Services
Colorado Department of Public Health and Environment
Colorado Foundation for Families and Children
Colorado Head Start Association
Colorado Interagency Coordinating Council
Colorado Medical Home Advisory
Colorado Office of Professional Development
Colorado Parent and Child Foundation
Colorado Parent Teacher Association
Colorado Statewide Parent Coalition
Colorado Trust
Daniels Fund
Donnell-Kay Foundation
Early Childhood Councils Advisory Team
Early Childhood Councils Leadership Alliance
Early Childhood Education Association of Colorado
Early Childhood State Systems Team
Early Childhood Summit
Education Commission of the States
Family leaders
Family Resource Centers
Invest in Kids
JFK Partners, Project BLOOM
Local early childhood councils
Marsico Family Foundation
Merage Foundation
Mile High United Way
Morgridge College of Education, University of Denver
National Conference of State Legislatures
Office of Lt. Governor Barbara O'Brien
P-3 Subcommittee of P-20 Education Coordinating Council
Piton Foundation
Qualistar Early Learning
Rose Community Foundation
State Board of Education
Temple Hoyne Buell Foundation

Appendix C: CASE STUDY - A LESSON IN THE EFFECTIVENESS OF PRESCHOOL AND KINDERGARTEN CURRICULUM

A brand new study by the Institute of Education Sciences (IES) looked at 14 different commonly used pre-kindergarten and kindergarten intervention curricula. Represented in the table below, the study found that most preschool curricula are not effective for impacting student- and classroom-level outcomes (IES, 2008). Additional research is necessary to identify the essential elements of effective preschool curricula.

Effects of Preschool Curriculum Programs on School Readiness											
	Findings by Student-Level Outcomes					Findings by Classroom-Level Outcomes					
Curricula	Reading	Phonic awareness	Language	Mathematics	Behavior	Classroom quality	Teacher-child interaction	Early literacy instruction	Phonological awareness instruction	Early language instruction	Math concepts instruction
Bright Beginnings								+	+		
Creative Curriculum (Vanderbilt)											
Creative Curriculum (UNC-Charlotte)						+	+	+		+	
Creative Curriculum with Ladders to Literacy								+			
Curiosity Corner	Pre-K: 0 K: +									+	
DLM Early Childhood Express with Open Court Reading Pre-K	Pre-K: + K: +	Pre-K: + K: +	Pre-K: + K: +						+		
Doors to Discovery								+		+	
Early Literacy and Learning Model			Pre-K: 0 K: +								
Language-Focused Curriculum											
Let's Begin with the Letter People						+		+			
Literacy Express						+			+		
Pre-K Mathematics with DLM Early Childhood Express Math software				Pre-K: + K: 0							
Project Approach					Pre-K: 0 K: -						
Project Construct											
Ready, Set, Leap!											

NOTE: Abbreviations of the findings are:
Pre-K: Pre-kindergarten
K: Kindergarten
+: Finding of a positive impact
–: Finding of a negative impact
Blank Cell: Finding of no impact
0: Finding of no impact (when an impact is found for the other grade)

The Preschool Curriculum Evaluation Research Consortium (2008). Effects of Preschool Curriculum Programs on School Readiness (NCER 2008-2009). Washington, DC: National

1 Edmonds, R. *Effective Schools for the Urban Poor*, Educational Leadership, Volume 37, No. 1, 1979, page 15.

2 Early Childhood Colorado Framework (See Appendix B)

3 Education Week, Quality Counts, 2007

4 National Center for Children in Poverty, 2007

5 Kagan, 2008; Bogard and Takanishi, 2005; "Foundation for Child Development", 2005; Harvard Education Letter, 2005; Reynolds, 2003; King, 2006; Kauerz, K. (2006). Ladders of learning: Fighting fadeout by advancing PK-3 alignment. Washington, DC: New America Foundation.

6 Foundation for Child Development, 2006; Kauerz, 2006

7 National Association for the Education of Young Children, Early Childhood Program Standards, 2005

8 Hyson, 1996; Dahlberg, Moss & Pence, 1999; Marshall et al, 2000; Goffin & Wilson, 2001; Eisner, 2002; Frede & Ackerman, 2007; Hurst, 2008

9 Commission on NAEYC Early Childhood Program Standards and Accreditation Criteria. (2003). Draft NAEYC early childhood program standards. from www.naeyc.org/accreditation/nextera.asp; Frede, E. (1998). Preschool program quality in programs for children in poverty. In W. S. Barnett & S. S. Boocock (Eds.), Early care and education for children in poverty: Promises, programs, and long-term outcomes. Buffalo, NY: State University of New York Press.

10 National Research Council. (2001). Eager to Learn: Educating Our Preschoolers. Committee on Early Childhood Pedagogy, B.T. Bowman, M.S. Donovan, and M.S. Burns, eds. Commission on Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

11 Dodge, 2004 D. T., Heroman, C., Charles, J., & Maiorca, J. (2004). Beyond outcomes: How ongoing assessment supports children's learning and leads to meaningful curriculum. Young Children, 20-28; Kagan, S. L., & Kauerz, K. (2006). Preschool programs: Effective curricula. In R. E. Tremblay, R. deV Peters, M. Boivin & R. G. Barr (Eds.), Encyclopedia on Early Childhood Development. Montreal, Quebec: Center of Excellence for Early Childhood Development. Available at: http://www.child-encyclopedia.com/documents/Kagan-KauerzANGxp.pdf.

12 National Association for the Education of Young Children. (Adopted 2009). NAEYC Position Statement: Developmentally Appropriate Practice in Early Childhood Programs Serving Children from Birth through Age 8, 3rd edition.

13 National Research Council. (2005). How Students Learn: History, Mathematics, and Science in the Classroom. Committee on How People Learn, A Targeted Report for Teachers, M.S. Donovan and J.D. Bransford, Editors. Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

14 Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). Preventing reading difficulties in young children. Washington, D.C.: National Academies Press.

15 Kagan & Kauerz, 2006

16 Heckman, J.J., Stixrud, J. and Urzua, S. (February 2006) The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior. NBER Working Paper Series, Vol. w12006, 2006. Available at SSRN: http://ssrn.com/abstract=881240; Borghans, L. Bas ter Weel and Bruce A. Weinberg, People People: Social Capital and the Labor-Market Outcomes of Underrepresented Groups (January 2006).; Bowles, S., Gintis, H. Osborne, M. (2001). *Incentive-enhancing preferences: Personality, behavior and earnings*, American Economic Review, 9 (May), pp. 155-158.

17 Heckman, 2000; Thompson, 2002; Bogard, K., & Takanishi, R. (2005). PK-3: An aligned and coordinated approach to education for children 3 to 8 years old. Social Policy Report: A publication of the Society for Research in Child Development, 19(3), 1-24.; Pianta, R. C., & Hadden, D. S. (2008). What we know about the quality of early education settings: Implications for research on teacher preparation and professional development. The State Education Standard (June), 20-27.

18 NRC, 2001

19 NRC, 2001

20 Schweinhart, L. J., & Weikart, D. P. (1997). Lasting differences: The High/Scope Preschool Curriculum Comparison study through age 23. Ypsilanti, MI: High/Scope Press. Marcon, R. (1999). Differential impact of preschool models on development and early learning of inner-city children: A three cohort study. Developmental Psychology, 35, 358-375. Marcon, R. A. (2002). Moving up the Grades: Relationship between Preschool Model and Later School Success; ECRP Vol. 4 No. 1 http://ecrp.uiuc.edu/v4n1/marcon.html

21 Frede, 1998; NRC, 2001.

22 Preschool Curriculum Evaluation Research Consortium. (2008). Effects of preschool curriculum programs on school readiness. Washington, DC: National Center for Education Research, Institute of Education Sciences, U.S. Department of Education.

23 Brady, M. (2004) Thinking Big: A Conceptual Framework for the Study of Everything. Phi Delta Kappan http://www.pdkintl.org/kappan/k_v86/k0412br1.htm

24 National Association of Elementary School Principals. (2007). K-8 Science. Principal, 87(2), 16-34.

25 Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children*. Washington, D.C.: National Academies Press.

26 National Reading Panel-NRP. (2000). Report of the National Reading Panel: Teaching Children to Read: An Evidence- Based Assessment of the Scientific Research Literature on Reading and its Implication for Reading Instruction. Reports of the subgroups. Washington, DC: National Institute of Child Health and Human Development.

27 Snow, 1998; National Research Council. (2005). How Students Learn: History, Mathematics, and Science in the Classroom. Committee on How People Learn, A Targeted Report for Teachers, M.S. Donovan and J.D. Bransford, Editors. Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

28 Principal, 2007

29 Bogard & Takanishi, 2005

30 Snow, 1998

31 Pianta, R. C., Belsky, J., Houts, R., Morrison, F., & National Institute of Child Health and Human Development Early Child Care Research Network. (2007). Opportunities to learn in America's elementary classrooms. Science, 315, 1795-1796.

32 Garcia, E. E. (2005). *Early childhood education of Hispanics in the United States.* Tempe, AZ: Arizona State University College of Education; NRC, 2005.

33 Moats, L. C. (1999, June). Teaching reading is rocket science: What expert teachers of reading should know and be able to do (pp. 1-32). Washington, DC: American Federation of Teachers.

34 Vygotsky, L.S. (1962). Thought & Language. MIT Press.

35 NAEYC, 2009

36 Torgeson, J. (2003). Progress toward understanding the instructional conditions necessary for remediating reading difficulties in older children. Preventing and remediating reading difficulties. Foorman, B. (ed). Maryland: New York Press.

37 Hubert, J. (December 2002/January 2003). First, Do No Harm: Preventing Misuse of High-Stakes Tests. Educational Leadership, 60 (4) 26-30.

38 NAEYC, 2009

39 Darling-Hammond, L., & Bransford, J. (2006). Preparing teachers for a changing world: What teachers should learn and be able to do. San Francisco, CA: Jossey Bass.

40 Pianta, R.C., & Stuhlman, M.W. (2004). Teacher-child relationships and children's success in the first years of school. School Psychology Review, 33, 444-458.

41 Espinosa, L. M. (2002). High-quality preschool: *Why we need it and what it looks like*. New Brunswick, NJ: National Institute for Early Education Research.; Pianta & Hadden, 2008.

42 Snow et al., 1998; Barnett, 1995; Dickinson, D.K., & Tabors, Patton, O, (Eds.) (2001) Beginning Literacy with Language: Young Children Learning at Home and School. Baltimore, MD: Paul H. Brookes Publishing.; Foorman, 2003; NRC, 2005

43 NRC, 2005

44 Snowman, J. & Biehler, R. (2003) *Psychology Applied to Teaching*. Houghton Mifflin.

45 NRC, 2005

46 Popham, W.J. (2004) America's Failing Schools: How Parents and Teachers Can Cope with No Child Left Behind. Falmer Press.

47 Snow, C.E. & Van Hemel, S.B. (Eds.) (2008) Early Childhood Assessment: Why, What, and How? National Research Council of the National Academies. Accessed online http://www.nap.edu/openbook.php?record_id=12446&page=73

48 Dodge et al, 2004

49 Horowitz, S., Kaloi, L. and Petroff, S. (2007). *Transition to kindergarten: Policy implications for struggling learners and those who may be at risk for learning disabilities.* National Center for Learning Disabilities. Head Start Bulletin (2003, July) U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families.

50 Campbell et al, 2002; Head Start Bulletin (2003, July) U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families. Issue 76.

51 Taylor, B. M., Pressley, M., & Pearson, P. D. (2000). Research-supported characteristics of teachers and schools that promote reading achievement. Washington, DC: National Education Association, Reading Matters Research Report. Taylor et al, 2001, Taylor, B. M., Peterson, D. S., Pearson, P. D., & Rodriguez, M. C. (2002). Looking inside classrooms: Reflecting on the "how" as well as the "what" in effective reading instruction. The Reading Teacher, 56(3), 270-279.; Pianta 2008; Pianta et al, 2007.

52 Snow & Van Hemel, 2008

53 Snow & Van Hemel, 2008

54 National Task Force on Early Childhood Education for Hispanics. (2008) Early Education and Hispanics in the United States. The State Education Standard (June), 48-51.

55 Popham, 2004

56 Snow & Van Hemel, 2008

57 Snow & Van Hemel, 2008

58 Dewey, J. (1953). *Essays in experimental logic*. New York: Dover (Original work published 1916).

59 Roskos & Vukelich, 2006