

IMPROVING EDUCATIONAL OUTCOMES IN NORTH CAROLINA: ALIGNING POLICY INITIATIVES IN PRE-K THROUGH GRADE 3

POLICY BRIEF

Executive Summary

High-quality early education provides the foundation for children to succeed in school, graduate from high school, enroll in post-secondary education, and complete a higher education degree. Programs that optimize learning gains during Pre-K through Grade 3 have important positive effects for student outcomes, particularly among children who are at academic risk. However, for some children these gains tend to fade out as they progress through school. *Early gains are most likely to persist if educational efforts are integrated in a Pre-K to Grade 3 policy framework that emphasizes improved program access, quality, and alignment.*

North Carolina is a leader in developing initiatives for enriching early environments and reducing academic achievement gaps, and is committed to a Pre-K to Grade 3 early education strategy. This strategy includes: widespread developmental screening, increasing NC Pre-K enrollments, developing kindergarten transition interventions, and ensuring reading proficiency at Grade 3 through comprehensive programs that develop literacy skills throughout the early grades.

While these initiatives have led to important improvements in the state's early education landscape, many children are currently entering kindergarten lacking school readiness skills, while others fail to sustain early learning gains and are unable to achieve reading proficiency by the end of third grade. Recommendations for strengthening and sustaining early learning through strategic alignment of policies and practices are detailed in Section IV, and include these key elements:

For Improving Access

- Increase enrollments in NC Pre-K through additional funding and enhanced outreach efforts.
- Ensure that teachers and administrators in grades K through 3 have sufficient training and support in the effective use of formative assessments for improving instruction.
- Expand kindergarten transition programs to include intensive interactions between teachers, students, and families.

For Improving Quality

- Support efforts to improve classroom quality and instruction in all programs participating in NC Pre-K.
- Standardize kindergarten transition tools and develop educator expertise in their use.
- Implement quality standards for use of formative assessments and other reading support programs included in the Read to Achieve initiative.

For Increasing Alignment

- Coordinate training for Pre-K and elementary grade teachers, and develop approaches that align curriculum and instruction in a developmental continuum.



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- Facilitate communication of transition information between Pre-K and kindergarten teachers, and integrate the information with the Kindergarten Entry Assessment process.
- Align K-3 early literacy and math skills development efforts and interim assessments with third grade testing standards, and provide mentoring for teachers to support children who are falling behind at each grade.

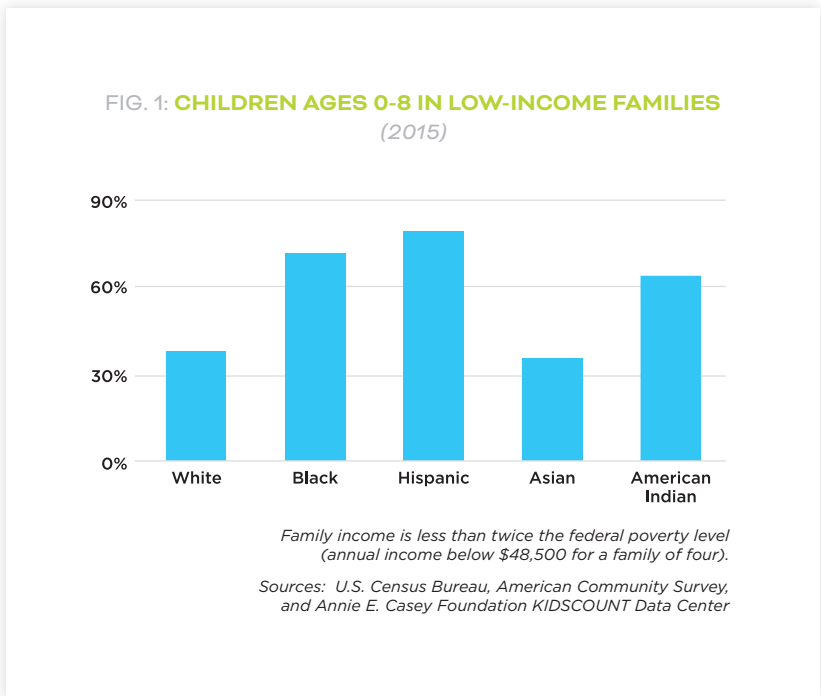
I. The Current Landscape of Pre-K through Grade 3 Education in North Carolina

In recent decades, North Carolina has implemented and expanded important efforts to support children prior to the kindergarten year, including the NC Pre-K program for at-risk 4-year-olds. Together with more recently implemented formative assessment and early literacy programs in grades K-3, the state seeks to comprehensively address early poverty and race gaps in educational achievement.

1. The population of young children: trends and characteristics

During the decade from 2005 to 2015, the state’s total population increased by 15 percent, but the number of children ages 0-8 increased by only 6 percent. While this trend seems to suggest a potential reduction in the support needed for young children, the increased numbers of children from low-income families indicate otherwise. The population of low-income children increased during this period, from 48 percent of the total young child population in 2005 to 54 percent in 2016. As depicted in Figure 1, socioeconomic disadvantage is much more frequently experienced by Black, Hispanic, and American Indian children.

Early educational disadvantages are particularly evident in North Carolina in the pervasive achievement gaps on the tests administered by the National Assessment of Educational Progress (NAEP). Over time, 4th graders in North Carolina consistently have scored higher than the national average in math and reading; however, economically disadvantaged children in North Carolina consistently score below the national average for children in this subgroup. In other words, the gap between economically disadvantaged children and other children in North Carolina is larger than it is elsewhere. Although achievement gaps within the state have reduced slightly over time, in 2015 only 21 percent of economically disadvantaged children in North Carolina achieved reading proficiency, as compared with 52 percent of their more advantaged peers. A similar gap exists in math scores. This difference is exacerbated by the rapid growth of the economically disadvantaged population in North Carolina public schools (Figure 2). Differences in reading skills by race closely follow the distribution of race by low-income



status, with 77 percent of Black and Latino students scoring below the 4th grade reading proficiency level, as compared with 49 percent of White students (Figure 3).

2. Early education policies and programs in North Carolina

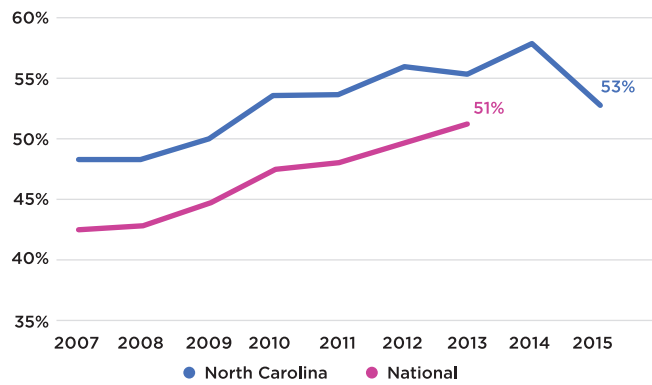
NC Pre-K. The statewide NC Pre-K Program was initiated in 2001 (as More at Four) to provide a high-quality educational experience for 4-year-old children meeting the eligibility criteria of low family income level or other risk factors, including: limited English proficiency, identified disability or developmental need, and chronic health condition. The program funds slots for children in a variety of classroom settings, including public schools, Head Start classrooms, and private and not-for-profit child care centers. Each provider must meet quality standards for curriculum, assessment, teacher qualifications, class size, child-to-adult ratio, and state child care licensing levels. On average, quality measures across settings have remained consistent at the medium to high range, with improvement over time in teacher education levels and certification.¹

Annual enrollments in NC Pre-K peaked in 2009 at 33,798 and declined due to decreased state funding until 2016, when the NC General Assembly allocated funding for an additional 260 slots, bringing enrollments to 29,400 in 2017. At its peak in 2009, NC Pre-K served 50 percent of low-income 4-year-olds, and 45 percent in 2017 (Figure 4). With an additional 3,525 slots provided in the biennial 2017-18 state budget, enrollments in NC Pre-K may increase to nearly 50 percent of low-income 4-year-olds during 2018.

3. Programs promoting school success in grades K-3

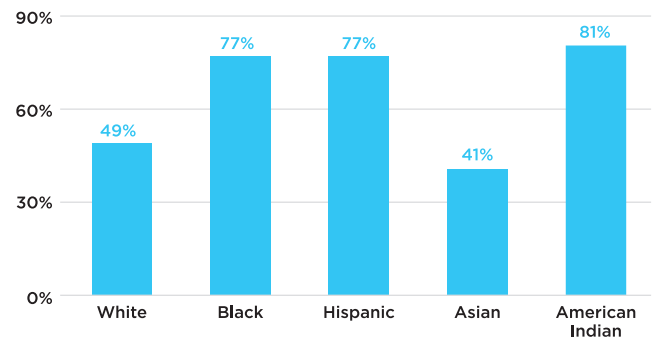
Efforts to enrich early educational environments seek to promote kindergarten readiness, so that children begin school on a trajectory for success. NC Pre-K serves primarily disadvantaged children whose skills

FIG. 2: PERCENT OF K-12 STUDENTS WHO RECEIVED FREE OR REDUCED PRICED MEALS



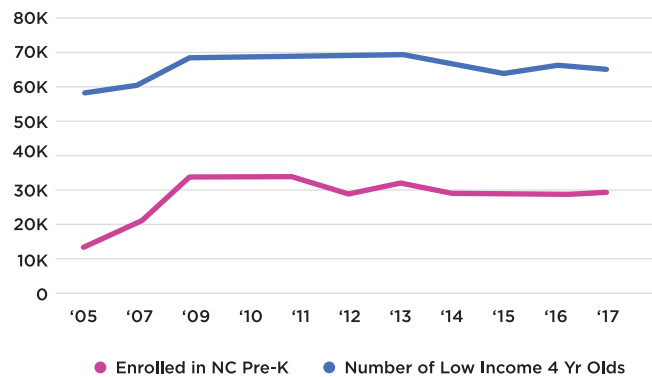
Source: BEST NC, Education in North Carolina, Facts and Figures, 2017

FIG. 3: 4TH GRADERS WHO SCORED BELOW READING PROFICIENCY LEVEL (2015)



Source: The Nation's Report Card, 2015 Reading Assessments, https://www.nationsreportcard.gov/reading_math_2015/#reading/state?grade=4

FIG. 4: ENROLLMENT IN NC PRE-K AND NUMBER OF LOW-INCOME 4-YEAR-OLDS



Living in families with income less than twice the federal poverty level. Sources: Peisner-Feinberg, E. S. (2017). North Carolina Pre-Kindergarten Program Evaluations, 2002-2016. Chapel Hill: Frank Porter Graham Child Development Institute; and U.S. Census Bureau, American Community Survey



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at the start of the program are lower than average, and there is solid evidence from statewide program evaluation studies that program participation has positive impacts on multiple dimensions of school readiness, including language, literacy and math skills, and social skills.² However, many children still enter school without having made the learning gains needed to master grade-level skills, often because they have not participated in a high-quality Pre-K experience. Among all entering kindergarteners in 2016, an estimated 44 percent scored below the benchmark goals that indicate adequate literacy skills at school entry. In spring 2016, half of the students enrolled in first grade and 47 percent of the students in second grade did not achieve grade-level scores in literacy skills/reading proficiency.³

Formative Assessment Processes. In response to a legislative mandate and requirements of the state's Race to the Top: Early Learning Challenge Grant, the NC Department of Public Instruction developed a kindergarten entry formative assessment (KEA) to identify gaps in school readiness and provide data in support of improving learning outcomes in the early grades. The KEA formative assessment process provides a comprehensive profile of a child's learning needs and strengths at the beginning of the kindergarten year and continued formative assessments throughout the year, with the goal of supporting iterative improvement in reading and other outcomes. The KEA assesses a student's progress across five areas of learning and development, by measuring fundamental skills and capacities aligned with specific components of the NC Standard Course of Study. This design reflects the NCDPI Office of Early Learning's approach to improving early education through coordinated learning from Pre-K through Grade 3. The KEA was implemented statewide in 2015, with plans to expand the process to include grades 1-3.

Complementary to the KEA, early literacy efforts in NC public schools involve ongoing formative and diagnostic assessment of students in grades K-3. Measures of student progress are monitored frequently for all students in order to guide instruction and intervention, and to provide support for at-risk students. This process is part of the legislatively mandated Read to Achieve program, which includes required grade retention for students who fail to demonstrate proficiency on the Grade 3 End of Grade (EOG) reading test. Despite the ongoing instructional supports and interventions for students throughout grades K-3, in 2016, 47 percent of third grade students did not achieve proficiency on the EOG test or retest. Some of these students received good cause exemption from mandatory retention, while others completed and passed alternative assessments approved by the State Board of Education; 14.4 percent were retained in the third grade.⁴

II. Evidence of the Effects of High Quality Programs in Pre-K through Grade 3

High-quality early education programs such as NC Pre-K provide significant gains in school readiness skills; some programs are associated with benefits throughout school and in post-secondary attainment. Successful transition to kindergarten and elementary grade level reading proficiency are strong indicators of early academic success, and are predictive of high school completion and enrollment in higher education.

1. Long-term benefits of high-quality Pre-K programs

Pre-K and School Readiness. Evaluation studies over several decades indicate that, on average, Pre-K education has a significant impact on cognitive skills at school entry, including literacy, language, and math skills. Large-scale programs have been shown to generate positive impacts, with higher-quality programs producing the largest benefits.⁵ School district Pre-K programs in



Chicago, Boston, and Tulsa were found to have significant positive effects on school readiness, as did statewide programs in Michigan, Georgia, and Texas.^{5,6} North Carolina's statewide NC Pre-K has been evaluated annually for 14 years and consistently demonstrates positive outcomes for children in key learning domains. Children participating in this program progress toward school readiness at a greater rate than is expected for typical developmental growth. Among dual language learners, children with lower English proficiency levels made gains at an even faster rate than the other children enrolled in NC Pre-K.⁷

Long-Term Pre-K Effects. Evaluations of small-scale, intensive, and high-quality early interventions such as the Abecedarian Project, implemented in North Carolina in the 1970s, report impressive long-term benefits for children from economically disadvantaged backgrounds. Participants in this and other model programs, including Perry Preschool and the Chicago Child-Parent Center, as adults were significantly more likely to have graduated from high school, attend college, be employed, and hold a skilled job.⁸ A meta-analysis of preschool effects indicates that model programs also are associated with reductions in crime and teen births.⁹

Adult outcomes have yet to be evaluated for most large-scale district and state preschool programs because these were implemented more recently. However, numerous studies address the question of whether pre-K benefits persist across school years, since improved academic outcomes in school are critical pathways to higher educational attainment.¹⁰ Summary reviews find that, on average, district and state pre-K programs produce initial learning gains that often partially fade as students progress through school.¹¹ Variation across Pre-K programs in benefits and fadeout has been linked to differences in program quality, alignment with elementary grade instruction, and the proportion of elementary grade peers who have participated in high-quality early childhood programs.¹²

In contrast to evaluations of other large-scale programs, recent studies evaluating the community-wide impact of investments in NC Pre-K find that program benefits do not fade out during the elementary grades; instead, the effects on student outcomes are enduring and positive. Among students in third grade between 2001 and 2012, access to NC Pre-K was associated with a gain of four months in reading instruction and two months in math instruction,¹³ and a 32 percent reduction in the likelihood of special education placement.¹⁴ These outcomes are consistent with NC Pre-K's high classroom and teacher quality standards, as well as alignment of NC Pre-K with elementary grade curricula. The benefits also reflect the potential spillover of benefits to classroom peers not directly enrolled in the program, in part through improvements in the quality of classrooms that receive NC Pre-K funded slots.

2. Benefits of programs that promote student success in kindergarten through Grade 3

Kindergarten Transition Practices. Researchers and educators agree that children's experiences at kindergarten entry have a strong influence on their prospects for success in school.¹⁵ Difficulties during this critical period are associated with long-term trajectories of academic failure, leading to low levels of educational attainment and career success. Nationally and in North Carolina, most elementary schools provide some services or programming meant to ease the entry into formal schooling. However, transition practices and their implementation vary considerably, with many schools limiting efforts to generic or low-intensity practices, such as mailing information to families or hosting information sessions for parents. Research using national survey data finds that students from lower-income families are more likely to experience difficulties adapting to formal schooling, but have less access than their more affluent peers to more intensive and effective transition programs, such as teacher home-visits and child/parent classroom orientation sessions.¹⁶



Kindergarten Readiness and Formative Assessments in K-3. More than 70 percent of elementary schools administer readiness assessments at kindergarten entry, using the information to make decisions about enrollment, determine class placements, and help teachers individualize instruction.¹⁷ With support from federal programs such as Race to the Top grants, many states have expanded school entry assessments into valuable early educational interventions for improving instruction and learning, as well as for informing early education policy. North Carolina is among the 30 states currently implementing the Kindergarten Entry Assessment (described above) as a comprehensive formative assessment process administered to all children at the beginning of the kindergarten year. Early reviews of state KEA programs have focused on implementation and find positive support for the process among teachers and administrators, but also note difficulties in using assessment data for identifying student progress across developmental domains and for tailoring instruction to meet individual children’s skills and needs.¹⁸ The findings suggest the need to develop additional training and mentoring for educators and administrators on data collection and use, and on alignment of kindergarten curricula with KEA learning domains.

In North Carolina, as in many other states, the KEA is part of a comprehensive statewide strategy of assessment for learning and development in K-3. The strategy includes summative assessments that evaluate learning at the end of the year and are designed to measure progress after instruction has been completed. However, the North Carolina Department of Public Instruction gives greater emphasis to formative assessments during grades K-3, which evaluate gains in learning throughout the school year and generate information to guide differentiated instruction in order to best meet each student’s specific needs. Across the country, educational leaders view formative assessments as promising levers for improving student performance and for achieving grade-level proficiency in core academic skills. The few studies on the impact of formative assessments for student outcomes suggest that, on average, they lead to small but significant improvements in math and reading achievement in grades 3 through 8.¹⁹

Early Literacy Interventions. Education leaders across the country have committed to policies for implementing far-reaching early learning interventions that lead to reading proficiency in third grade. The end of third grade is viewed as a critical point at which students must have a strong foundation of the language and literacy skills needed for success in school, across grades and subject areas.²⁰ Third grade reading skills are a consistent predictor of academic outcomes in the short term, and of educational attainment in the long term. A national study found that children who did not read well by the end of third grade were four times more likely than proficient readers to drop out of school.²¹ In a study that tracked a cohort of North Carolina students enrolled in third grade in 1998, low reading scores at the end of third grade were found to be a strong predictor of high school dropout.²² Estimates of student outcomes from Tennessee’s Project STAR indicate that kindergarten reading skills scores are highly predictive of college attendance and of the quality of the college that a student attends.²³

North Carolina’s current early literacy program, Read to Achieve, was implemented statewide in 2012 with the goal of improving long-term student outcomes through support for on-grade reading proficiency among all third graders. Between 2011 and 2015, students in North Carolina improved average reading scores on the Grade 4 National Assessment of Educational Progress (NAEP) by about half a grade level, and fewer students scored below proficiency.²⁴ In a recent early impact analysis, researchers examined the extent to which changes in average reading scores in North Carolina may be causally attributable to Read to Achieve. The researchers estimated program effects on test scores following the end of third grade reading test in 2013-14, with a focus on the impact of the mandatory grade retention component (students must be retained if they do not achieve proficiency at the end of third grade). Studies of similar programs in Chicago, New York City, and Florida found that grade retention based on reading performance improved short-term



outcomes for students, and that in New York and Florida these positive effects remained stable over time. In contrast, initial findings from the North Carolina study indicate that Read to Achieve had no effect on student reading scores in the year following the third grade; however, when more recent data are available it will be possible to evaluate the precision of these estimates and to assess longer-term impacts.²⁵

While early math skills are included in North Carolina's early grades formative assessment processes, a statewide math intervention parallel to Read to Achieve has not yet been implemented. Nationally, mathematics knowledge and skills are receiving increasing emphasis in K-3 classrooms, given evidence that early math skills are significantly predictive of subsequent literacy skills and of high school success.²⁶ Early skill development is emphasized in North Carolina's new K-12 Standard Course of Study for Mathematics (to be implemented in 2018-19), which sets curriculum and practice standards to promote mathematical proficiency in every grade.

III. Aligning Pre-K to Grade 3 programs

In order for early education efforts to contribute to the longer-term goal of increasing educational attainment, it is important to understand the program quality conditions under which early learning gains can be sustained over time. A promising strategy for improving the quality of early education involves alignment between what is learned in preschool and what is taught in each of the early grades, through an integrated Pre-K to Grade 3 educational approach.

Importance of Quality and Alignment in Early Education

Research on differences in the persistence of early education benefits often refers to the quality of the child's learning environment in elementary school as the key to sustaining academic skills acquired in high-quality preschool programs. Measures of learning environment quality and its effects vary across studies. Smaller class sizes, full-day kindergarten, and more instruction time are quality indicators associated with improved academic outcomes, though findings are mixed on the magnitude and persistence of these effects.²⁷ There also is evidence that preschool effects are sustained when elementary grade classes do not repeat curricular content that children had mastered in pre-K, and that exposure to advanced content in kindergarten promotes important new skill development.²⁸

An important component of quality in early learning is the alignment between what is learned in preschool and what is taught in each of the early grades. Pathways toward improving quality through alignment are part of the Pre-K to Grade 3 approach to education that is considered by many researchers and education leaders to be the most promising framework for meeting the needs of young students. The Every Student Succeeds Act of 2015 provides federal support for strengthening the PK-3 continuum of early learning through coordination and collaboration among early childhood education programs and elementary schools. Frameworks for implementing this strategy involve vertical alignment of teacher quality, instructional tools, curriculum, standards, and assessments in a coherent plan, such that a child's learning experiences build on gains from previous years and are linked with those of future grades.²⁹ Evaluations of the Chicago Child Parent Center that employs a PK-3 approach find that participant children were less likely to drop out of school and attained more years of schooling than did the children who were not in the program.³⁰ A study of Hawaii's PK-3 initiative found substantial gains in reading proficiency associated with the program, as well as development of collaborative relationships among teachers, administrators, and parents.³¹



Pre-K to Grade 3 in North Carolina

North Carolina has moved decisively in the direction of an integrated Pre-K to Grade 3 early learning framework. One example of the state's early commitment to this approach is the long-standing North Carolina Pre-K and Kindergarten Demonstration Program, created in 2001 to help educators understand how to smooth children's transition to school. The program provides opportunities for skilled teachers to demonstrate how to balance structure (standards, curriculum, and assessments) with instructional practices in ways that best meet the developmental needs of preschoolers and kindergarteners.

Other elements of North Carolina's commitment to a Pre-K to Grade 3 early education strategy include:

- **Legislation requiring school districts to develop plans for improving the transition from Pre-K to kindergarten, in a gradual implementation process toward full scale-up in 2020.**³² State agencies are collaborating on creating a standardized method for Pre-K teachers to document children's learning status in the five domains of learning and development, which will align vertically with the construct progressions comprising the Kindergarten Entry Assessment.³³ This transition information will be communicated to the child's receiving kindergarten program.
- **Creation of the B-3 Interagency Council: The NC General Assembly created the B-3 Interagency Council in 2017.** It is tasked with "establishing a vision and accountability for a birth through grade three system of early education." The Council will be addressing standards and assessments, data-driven improvements and outcomes, teacher and administrator preparation and effectiveness, instruction and environment, transitions and continuity, family engagement, and governance and funding.
- **Cross-agency collaboration to support additional components of the Pre-K through Grade 3 continuum.** For example, the NC Pathways to Grade-Level Reading initiative is led by the North Carolina Early Childhood Foundation, in cooperation with early learning agencies, policymakers, and philanthropic and business leaders, to develop shared measures of success and coordinated strategies that lead to reading proficiency in third grade.³⁴
- **Development of the NC P-20W data system that allows tracking children's experiences with programs administered by the state.** A comprehensive and integrated data system is essential for educators and researchers to establish the relationship between early education practices, measures of student learning, educational attainment, and success in the workforce. Partners include the NC Early Childhood Integrated Data System, NC Department of Public Instruction, institutions of post-secondary education, and the Department of Commerce.

IV. Key Findings & Recommendations for Pre-K to Grade 3

North Carolina is a national leader in developing a comprehensive approach to early childhood education in Pre-K through third grade. Current and planned interventions in preschool and early elementary grades have considerable promise for improving later academic achievement, successful school completion, and higher education attainment, as summarized in the following findings and recommendations:



Pre-K

High quality Pre-K programs can have significant and enduring impact on school readiness, academic outcomes in school, high school graduation, and post-secondary attainment.

In order to derive the greatest benefits from NC Pre-K:

- Continue to increase funding levels in order to provide more access for low-income children and to expand benefits to classroom peers.
- Support efforts to increase overall classroom quality.
- Invest in developing, recruiting, and retaining Pre-K teachers in order to continue to improve instruction.
- Ensure that elementary school principals have sufficient training in early childhood development, as well as in early academic content.
- Through outreach efforts, address barriers to access that may limit enrollment among groups of children who could benefit greatly. Challenges to program access include:
 - Travel distance to NC Pre-K providers, and reliability of public transportation.
 - Limited parent and caregiver knowledge and access to information about program availability.
 - Limited availability of early care and extended hour options to align with parents' work schedules.
 - Language barriers and fear of deportation for immigrant families.
 - Limited classroom space.

Kindergarten Transition

Smoothing a child's entry to formal schooling has enduring benefits for long-term academic success, suggesting a need to increase and standardize kindergarten transition practices in North Carolina.

In 2016, the North Carolina legislature directed NCDPI and the Division of Child Development and Early Education to develop strategies for systematically addressing transitions from preschool to kindergarten. These recommendations for improving transitions also will be addressed by the newly-created B-3 Interagency Council:

- Develop a standardized transition tool that can be used as part of the KEA process.
- Identify the most effective methods for communicating transition information.
- Provide training and support for use of transition plans through collaborative professional development for pre-K and kindergarten teachers.
- Align Pre-K and kindergarten curricula.
- Encourage use of transition practices involving child/parent/teacher interactions that will foster development partnerships.
- Increase educator expertise in early literacy and math instruction.
- Increase educator expertise in effective differentiated instruction for kindergarten students.



Early Elementary Grades

North Carolina's Kindergarten Entry Assessment, the formative assessment processes through Grade 3, and the Read to Achieve program together provide a strong framework for reaching universal grade-level reading proficiency by the end of third grade. These practices hold significant promise as interventions for improving the transition to school as well as for strengthening early learning.

The Kindergarten Entry Assessment is in its early stages of implementation. Positive impacts of this program hinge upon the effective use of assessment information for improving instruction. Practices for enhancing program effectiveness include:

- Additional training for teachers in the use of the assessment's electronic platform.
- Additional professional development opportunities focusing on interpretation of assessment data and application of this information to instruction.
- Opportunities for collaborative work among teachers.
- More explicitly aligning activities that support student progress on KEA learning domains with guidelines for literacy and mathematics instruction in kindergarten.
- Ensuring that elementary school principals have sufficient training in the need for, and use of, KEAs.

North Carolina has implemented a comprehensive approach toward supporting early literacy and third grade reading proficiency. This approach builds upon the Kindergarten Entry Assessment and includes formative assessments in grades K-3, practices that use assessment data to differentiate instruction and support progress toward grade-level proficiency, elimination of social promotion, and reading development for retained students. Positive and enduring impacts of this approach can be enhanced by strengthening efforts as follows:

• Strengthen professional development for educators by:

- Focusing on the alignment of interim formative assessments with third grade reading standards.
- Using models and modeling to demonstrate effective practices.
- Expanding access to expert coaching and support throughout the school year.
- Among school administrators, aligning purchases and resources with intended outcomes.

• Intensify effort to reduce grade retention by:

- Expanding access to additional instructional resources for students to improve skills prior to the third grade.
- Implementing quality standards for all programs that provide reading development for retained students: reading camps, accelerated reading classes, and transitional third and fourth grade classes.
- Mentoring teachers who have struggling readers in order to strengthen their instruction techniques.



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POST-SECONDARY



WORKFORCE

ALIGNING POLICY INITIATIVES
IN PRE-K THROUGH GRADE 3

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