(C) Data Systems to Support Instruction *(47 total points)*

Quality Standards and Assessment

Turnaround of Lowest Achieving Schools

Great Teachers & Principals

Career- and College-Ready Students

• Enhance Statewide Longitudinal Data System

• Develop Statewide Instructional Improvement System

Data Systems to Improve Instruction
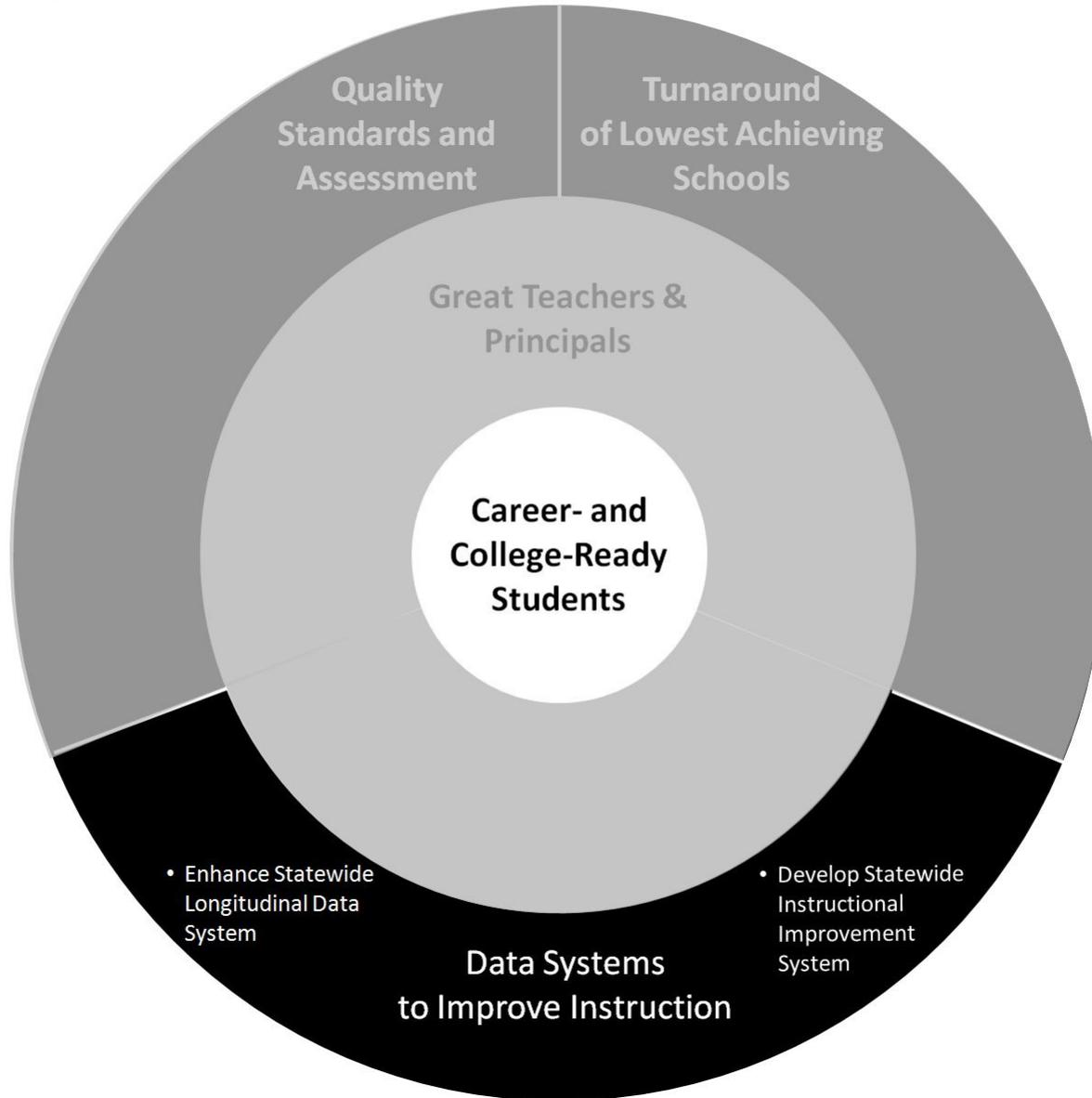
State Reform Conditions Criteria

(C)(1) Fully implementing a statewide longitudinal data system *(24 points – 2 points per America COMPETES element)*

The extent to which the State has a statewide longitudinal data system that includes all of the America COMPETES Act elements (as defined in this notice).

In the text box below, the State shall describe which elements of the America COMPETES Act (as defined in this notice) are currently included in its statewide longitudinal data system.

Evidence:
- Documentation for each of the America COMPETES Act elements (as defined in this notice) that is included in the State's statewide longitudinal data system.

Recommended maximum response length: Two pages

C.1. Fully implementing a statewide longitudinal data system

North Carolina's statewide longitudinal data system includes all of the America COMPETES Act elements. We have been engaged formally in sharing longitudinal data for policy making across the State's education and workforce sectors for almost twenty years, and are now in the process of significantly enhancing our SLDS to improve data quality, accessibility, and use both within the PK-12 sector and across the PK-20+ continuum.

Background: Evolution of the NC SLDS

NC has been a leader in collection, management, and use of education data across the P-20+ education-to-workforce continuum. Over the past twenty years, our State Longitudinal Data System (SLDS)[3] has evolved to include multiple data stewards, technology mechanisms, and inter-agency partnerships. In our continuous efforts to improve the reliability, accessibility, and robustness of the system, a number of key initiatives have contributed to our development of the advanced system we have in place today (that includes all of the America COMPETES Act elements; see Table 11 below) and the plans we have to take that system further still.

In 1992, the State established a Common Follow-up System – a cooperative venture of several State agencies under the auspices of the NC State Occupational Information Coordinating Committee – which was designed to enable evaluation of the effectiveness of the State's publicly supported educational, employment, and training programs. The Common Follow-up System included a limited set of linkable individual record-level demographic and program participation data from each of the following agencies:

- The NC Department of Public Instruction (NCDPI)
- The NC Community College System
- The University of North Carolina (UNC)
- The Employment Security Commission of NC
- The NC Department of Health and Human Services

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[3] Though much of this system has been functional for two decades, we have only referred to it as an "SLDS" for about five years.

- The NC Department of Labor.

In 1995, the NC General Assembly codified in statute the requirements that NC operate this system and that the agencies noted above contribute specified data to it annually. While use of these data for policy-making has focused primarily on adjusting workforce development programming, education leadership has used the Common Follow-up reports to track numbers of high school graduates who move on to higher education and the workforce in NC. The initiative has laid the groundwork for both strong inter-agency collaboration around data and for development of the more robust education program-focused SLDS we have today.

Coincident with this sharing among State agencies, since the late 1980s NCDPI has also been producing and sharing with various research partners student record-level data like those referenced in the America COMPETES Act. Through memoranda of understanding with Duke University's NC Education Research Data Center (Duke Data Center), the NC Community College System, and UNC, NCDPI has provided voluminous data files annually in return for services (such as the assignment of random research identifiers to teacher and student files, as well as screening of research requests from other entities) and analysis (such as evaluation of legislated or NCDPI-initiated programs). This partnership has produced much useful analysis that has informed policy and decision making, but alone, the partnership has not been sufficient to address some of the SLDS's mechanical inefficiencies (*e.g.*, in assembling and sharing data files) and limitations on data quality. Fortunately, a related effort now nearing completion has addressed these issues.

In 2007, NCDPI received funding as part of the National Center for Education Statistics Institute of Education Sciences SLDS grant program to establish a robust PK-12 SLDS that includes statewide unique student and staff identifiers *that are not social security numbers*, as well as a comprehensive centralized statewide PK-12 data repository that supports trend analysis and exploration of the relationships between various education inputs and student outcomes. This new DPI technology system, called the Common Education Data Analysis and Reporting System (CEDARS) automates the reliable linking and analysis of data sets that in prior years had been assembled through labor-intensive manual processes. As noted below, the unique identifier system is now in operation and already is improving data quality at the local education agency (LEA) and State levels. The CEDARS data repository, targeted for

completion in October 2010, will automate creation of longitudinal data sets, enable users in NCDPI and the LEAs to produce standard and *ad hoc* reports through a powerful centralized, web-based business intelligence tool, and enable researchers to obtain mediated data extracts. Until the CEDARS repository construction is completed, NCDPI will continue to share data (now containing student and staff unique identifiers), consistent with current practice, with the agency and research center partners noted above.

The next phase in the continuous improvement of the NC SLDS also has already begun. Since summer 2008, NCDPI has worked closely with NC's other education sectors and the NC Employment Security Commission to develop clear plans for an enhanced, robust PK-20+ SLDS, known as "NC P20+." Although NCDPI's 2009 proposal to USED requesting a PK-20 SLDS grant to support the NC P20+ initiative was not funded, NC will still push forward, albeit less ambitiously, efforts to establish formal, statewide, collaborative governance and a technology infrastructure that will enhance accessibility, quality, interoperability, and use of shared data needed for sector-specific and statewide, cross-sector analysis and reporting.

Current Status: All 12 Elements

While NC continues to improve our SLDS, by completing initial implementation of the CEDARS PK-12 repository and launching the NC P20+ initiative, we are merely enhancing a system that already contains all twelve of the America COMPETES Act elements. Table 11 explains how the existing NC SLDS meets each of the elements.

Table 11: Status of the 12 *America COMPETES Act* SLDS Elements in NC

America COMPETES Act Element	NC SLDS Status
1. A unique statewide student ID that does not permit a student to be individually identified by users of the system [PK-16]	**NC has a unique statewide student ID that does not permit a student to be individually identified by users of the system [PK-16].** As part of CEDARS, NCDPI has implemented a statewide unique student and staff identifier system. Each student and staff person participating in all programs (pre-K through early college high school, which sometimes involves a grade 13) overseen by the NC State Board of Education (State Board) is uniquely identified, at their earliest contact with an State Board program, with a random number that is used strictly for educational management, evaluation, and planning purposes (*i.e.*, not a Social Security Number). As part of the NC P20+ initiative, the NC Community College System, University of North Carolina, and the Association of NC Independent Colleges and Universities have agreed to store the PK-12 unique student identifier with their student records to enable linkage across education sectors for purposes of analysis and planning. This agreement effectively makes the PK-12 unique identifier a statewide "NC P20+ unique identifier." The higher education and workforce sectors are working to streamline and automate the processes by which they access and store the NC P20+ unique identifier in their student data files. In addition, as part of the NC P20+ initiative, the education and workforce sectors will explore enriching the SLDS by attaching P20+ unique identifiers to historical data files. Another notable feature of the NC unique identifier system is that it is designed so that in the future, as the NC P20+ collaborative expands to include data from other State agencies, such as the Department of Juvenile Justice, any new agency's efforts to access and store the NC P20+ unique identifier will be relatively simple.

America COMPETES Act Element	NC SLDS Status
2. Student-level enrollment, demographic, and program participation information [PK-16]	**All NC education sectors can produce student-level enrollment, demographic, and program participation information [PK-16].** NCDPI, the NC Community Colleges System, and UNC have strong, centralized data collection and management systems in place. The NC Independent Colleges and Universities and the NC Early Childhood Data Group, which represents a collaboration between various early childhood service agencies, currently produce these data through other means.
3. Student-level information about the points at which students exit, transfer in, transfer out, drop out, or complete P-16 education programs [PK-16]	**All NC education sectors collect student-level information about the points at which students exit, transfer in, transfer out, drop out, or complete P-16 education programs [PK-16].** These collection efforts will be improved and better coordinated across sectors as part of the NC P20+ collaborative efforts.

America COMPETES Act Element	NC SLDS Status
4. The capacity to communicate with higher education data systems [PK-16]	**NC's SLDS has the capacity to communicate with higher education data systems [PK-16].** The operational PK-12 statewide unique identifier system (established through CEDARS) enables all NC education sectors to access unique identifiers for students, subsequently enabling linkage of individuals' records across sectors. As noted in #1 above, NC higher education entities have agreed to adopt these unique identifiers. Work remains to improve automated data integration both within and across sectors by formalizing business and technology processes to access and store the unique identifier and to exchange linked data files; this enhancement work is targeted as part of the NC P20+ initiative.
5. A State data audit system assessing data quality, validity, and reliability [PK-16]	**Each NC education sector employs a data audit system that assesses data quality, validity, and reliability [PK-16].** NCDPI, the NC Community College System, and UNC all implement independent but complementary processes and procedures for enforcing sector-specific data quality, validity, and reliability standards. As part of the NC P20+ initiative, all the NC education sectors will collaborate to ensure the quality, validity, and reliability of the shared NC P20+ data set.
6. Yearly test records of individual students with respect to assessments under section 1111(b) of 1965 ESEA [PK-12]	**NCDPI has collected yearly test records of individual students with respect to assessments under section 1111(b) of 1965 ESEA [PK-12] data since the early 1990s.**

America COMPETES Act Element	NC SLDS Status
7. Info. on students not tested, by grade and subject [PK-12]	**NCDPI has collected information on students not tested, by grade and subject [PK-12], since the early 1990s.**
8. A teacher identifier system with the ability to match teachers to students [PK-12]	**NCDPI has a teacher identifier system with the ability to match teachers to students [PK-12].** NC's PK-12 unique identifier system assigns a statewide unique identifier for each teacher employed by the public schools. This unique identifier is then stored by the State's student information system, which contains all students, their course/class enrollments, and the teachers associated with those courses/classes. Together, these data enable matching of students and teachers at specific grade levels and/or for specific courses for purposes of analysis and reporting.
9. Student-level transcript info., including information on courses completed and grades earned [PK-12]	**NCDPI captures and produces student-level transcript information, including information on courses completed and grades earned [PK-12].** The NCDPI-operated statewide student information system collects these data, which can be transferred both between local education agencies (LEAs) and, through a partnership with the College Foundation of NC, between LEAs and UNC campuses.

America COMPETES Act Element	NC SLDS Status
10. Student-level college readiness test scores [PK-12]	**NCDPI has student level college-readiness test scores [PK-12]** of several types and forms. First, NCDPI reports student performance on State tests in terms of equivalent Lexiles and Quantiles. This research-based, criterion-referenced framework estimates the complexity of the work that a student is capable of completing, based on his or her performance on State tests in reading and math, respectively. The Lexile/Quantile scale enables comparison of a student's demonstrated capability to established benchmarks for the complexity of work required in college, the workplace, and the military. NC also has a statewide license enabling the NCDPI and all LEAs to access predictive reports from the Educator Value-Added Assessment System (EVAAS). These reports estimate a student's achievement trajectory based on past performance. More details about this system are included in Section D2. NCDPI procures extensive Scholastic Aptitude Test (SAT) data from the College Board for all students taking the SAT. Also, NC provides funding for each student in grade 10 to take the PSAT and records score data from the College Board for those students.

America COMPETES Act Element	NC SLDS Status
11. Data that provide information regarding the extent to which students transition successfully from secondary school to postsecondary education, including whether student enroll in remedial coursework (postsecondary)	**NC collects data that provide information regarding the extent to which students transition successfully from secondary school to postsecondary education, including whether student enroll in remedial coursework (postsecondary).** NCDPI, the NC Community College System, UNC, and the NC Employment Security Commission collaborate on several standard tracking/reporting efforts (*e.g*., Common Follow-up System, High School Feedback Reports, Freshman Performance Report) that address these topics. Through the NC P20+ initiative, these information products will be further refined and/or expanded.

America COMPETES Act Element	NC SLDS Status
12. Data that provide other information determined necessary to address alignment & adequate preparation for success in postsecondary education	**In addition to those elements noted above, NC has rich longitudinal data that provide other information determined necessary to address alignment & adequate preparation for success in postsecondary education.** NC data, provided through the Duke Data Center, have enabled many, varied studies exploring the relationships between PK-12 education programs and policies, student performance, and student matriculation to and success in post-secondary education. These studies have included the following: • Using Lexiles to Support Instruction and Improvement in NC Schools • The Effect of *Teach for America* on Student Performance in High School • Study of the Efficacy of the NC Learn and Earn Early College High School Model • Effects of Summer Academic Programs in Middle School on High School Test Scores, Course-taking, and College Major • Extending Opportunity in Higher Education: Starting and Finishing at Public Universities NC also is conducting an ongoing study examining the differential impacts on PK-12 student performance of teachers prepared in UNC teacher preparation programs. UNC is using the findings from the first wave of this study to guide its review and reform of teacher preparation programs (see Section D4). Expanding upon and enhancing this type of action-oriented research is a primary focus of the NC P20+ initiative.

Reform Plan Criteria

(C)(2) Accessing and using State data *(5 points)*

The extent to which the State has a high-quality plan to ensure that data from the State's statewide longitudinal data system are accessible to, and used to inform and engage, as appropriate, key stakeholders (*e.g.*, parents, students, teachers, principals, LEA leaders, community members, unions, researchers, and policymakers); and that the data support decision-makers in the continuous improvement of efforts in such areas as policy, instruction, operations, management, resource allocation, and overall effectiveness.[4]

The State shall provide its detailed plan for this criterion in the text box below. The plan should include, at a minimum, the goals, activities, timelines, and responsible parties (see Application Instructions or Section XII, Application Requirements (e), for further detail). Any supporting evidence the State believes will be helpful to peer reviewers must be described and, where relevant, included in the Appendix. For attachments included in the Appendix, note in the narrative the location where the attachments can be found.

Recommended maximum response length: Two pages

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[4] Successful applicants that receive Race to the Top grant awards will need to comply with the Family Educational Rights and Privacy Act (FERPA), including 34 CFR Part 99, as well as State and local requirements regarding privacy.

C.2. Accessing and using State data

NC has two strategies in place to help the State meet the goal of ensuring that data from the State's SLDS are accessible to, and used to inform and engage (as appropriate), key stakeholders (*e.g.*, parents, students, teachers, principals, LEA leaders, community members, professional associations, researchers, and policymakers). These strategies ensure that the data made available support decision-makers in the continuous improvement of efforts in such areas as policy, instruction, operations, management, resource allocation, and overall effectiveness.

Strategy One: Providing Sector-Specific Data and Information Products

All NC education sectors are committed to improving student learning and to collecting data needed to establish the effectiveness of policies and practices; *i.e*., to enabling true evidence-based decision-making by State and local policymakers and service providers. To this end, all NC education sectors currently produce annual reports for their direct clients and for the public that are built on sector-specific demographic, program participation, and performance data. Each sector makes its specific plan for creating these data and information products based on assessment of client needs (including the needs of other education sectors) and public interest. For example, in the PK-12 arena, NCDPI creates many products, some of which are mandated federally (*e.g*., EDEN/EdFacts submissions) or by the State (*e.g*., statutory Consolidated Report on School Crime and Violence), some of which are in response to specific requests or research initiatives (*e.g*., files for the NC Education Research Data Center, housed at Duke University, and for SAS Institute, operator of the Educator Value-Added Assessment System), some of which (*e.g*., Statistical profile, Highlights of the Public Schools Budget, interactive LEA Expenditures website) are specifically targeted for State and local policy makers, and some of which are in anticipation of general public interest (*e.g*., interactive School Report Cards and graduation rate websites). Highlights of NCDPI's highest-priority and most-utilized data and information products, organized by target audience, include:

- *For Parents and Students*. After each administration of end-of-grade or end-of-course State tests, parents receive an Individual Student Report, which details how the student performed on the test. The report includes the student's scale score, achievement

level, and percentile rank; and Lexile and Quantile scores.[5] In grades three through eight, tests are placed on a developmental scale so that parents can determine the growth a student makes relative to the previous grade level. Students and parents can use assessment data, particularly the Lexile and Quantile scores, to set academic goals for the following year, identify areas of weakness, develop strategies for reaching those goals, monitor their progress over the year using benchmark assessment data, and adjust as needed.

- *For Teachers*. Since 1995-96, NCDPI has provided teachers annually with standard reports documenting their students' results on State end-of-grade tests of reading and math. As with the Individual Student report, this report for teachers includes a student's Lexile reading score and, beginning in 2009-10, a Quantile mathematics score. Using this score information, along with other diagnostic information (such as predictive analyses supplied by the Educator Value-Added Assessment System), teachers can plan effectively for whole-class instruction as well as for ways to differentiate to provide appropriate supports as needed.

- *For Local Education Agencies (LEAs)*. NCDPI provides each LEA with secured access to several technology applications, which are used to scan and score standardized State tests, to manage testing and accountability data, and to produce associated reports. One application enables LEAs to view their State test results by student, classroom, school, and LEA, and to compare to statewide results. LEAs are able to manipulate this application to create any desired cohort of students, permitting the evaluation of specific programs designed to raise achievement. A separate application provides access to historical data by student, classroom, and LEA. NCDPI Regional Accountability Coordinators work with each LEA testing office to process and analyze the data and to help the LEA administrators (including principals) utilize the data for local decision-making.

- *For Community Members/Associations/Public*. NCDPI provides through its public website and publication services various information products that respond to public demand for annual summary program, personnel, and budget statistics about schools

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[5] A Lexile is a criterion-based measures used for determining the complexity of text a student is able to comprehend successfully. A Quantile is a measure that determines a student's readiness to learn more advanced mathematical skills.

and LEAs. Examples of these products are the interactive School Report Cards site, which provides sortable, printable standard reports containing information about each LEA's and school's and overall State performance on the end-of-grade and end-of-course tests (see Section D2 for discussion of ABCs accountability system);, and the Finance and Business Services site, which provides a quick reference document entitled "Highlights of the Public Schools Budget" (containing summaries of State appropriations and expenditures by category, personnel statistics, *etc*.) and the State Statistical Profile, which contains various data on each LEA's expenditures, personnel, and student populations.

- *For Researchers*. As noted in the response to C1, NCDPI provides standard student-level data files annually to researchers at the Duke Data Center, UNC, SAS Institute (proprietors/operators of EVAAS) and to the NC Employment Security Commission (for the Common Follow-Up System).

- *For Policymakers*. In addition to the many customized, *ad hoc* information products NCDPI creates annually in response to legislative and other public data and information requests, the Departments provides through its website and publication services a number of standard reports created to address the expressed interests of State and local policymakers. Some of these products are noted above in the bullet addressing the Community Members/Associations/Public audience (*e.g*., School Report Cards, Statistical Profile) and some double as statutory reports provided to the General Assembly's Joint Legislative Education Oversight Committee (*e.g*., Consolidated Report on School Crime and Violence). Others products in high demand that are offered through the NCDPI website include standard reports regarding public schools personnel statistics, aggregate salary statistics, and various interactive spreadsheet tools that enable a user to sort allotments, general current expense expenditures, ARRA-related expenditures, and other types of data by LEA. The legislative fiscal analysts staffing the General Assembly's Education Appropriations Committee are heavy users of these reports and tools.

In addition to the products above that already are being created regularly NCDPI is poised to provide a range of stakeholders with enhanced capability to access important data through standard reports and *ad hoc* querying. In October 2010, the initial

implementation of the CEDARS longitudinal data repository and associated business intelligence tools will provide NCDPI and each LEA with improved access (through role-based security) to PK-12 data of multiple types (test scores, student information, program participation). NCDPI and LEA staff will be trained to use CEDARS business intelligence tools to produce annual and/or *longitudinal* reports relating various program and performance data across school years. By the end of the year, NCDPI also will scale up statewide an operational data store and business intelligence tool associated with the statewide student information system, the NC Windows of Information on Student Education (NCWISE). Expanding this *operational* business intelligence capability statewide will enable every LEA to produce standard and *ad hoc* reports using student data during the course of the school year.

Strategy Two: Providing Cross-Sector Data Analysis and Information Products

NC education sectors have a long history of sharing data across sectors to assess student achievement and evaluate policies and practices aimed at education system alignment and promotion of student success. Examples of some priority products of this cross-sector or joint analysis include the following:

- NC Early Childhood Data Group entities and the NCDPI maintain a close working relationship that helps both entities to refine programs to promote school readiness and a smooth transition from early childhood programs to kindergarten;

- The NC Community College System and UNC provide extensive performance feedback to high schools regarding how their graduates have performed in college (High School Feedback Report, Freshman Performance Report);

- UNC provides similar feedback to all NC community colleges regarding their students who later attend NC universities; and

- UNC, the Community College System, and the NC Independent Colleges and Universities work with the NC Employment Security Commission through the Common Follow-up System to relate educational experience to workforce participation and performance.

A notable recent example of rigorous, action-oriented research using cross-sector data (described in greater detail in Section D4) is UNC's and NCDPI's recent collaboration on a study of teacher quality that tracks the impact on student learning at the elementary, middle, and secondary school levels of teachers trained by the various UNC colleges of education. UNC already is using the results of

this study to guide modifications to the teacher preparation programs operating on its various campuses. Moving forward, a high priority focus of similar research will examine possible relationships between course-taking patterns, program participation, and enrollment in remedial coursework at an NC Community College or University.

(C)(3) Using data to improve instruction *(18 points)*

The extent to which the State, in collaboration with its participating LEAs (as defined in this notice), has a high-quality plan to—

 (i) Increase the acquisition, adoption, and use of local instructional improvement systems (as defined in this notice) that provide teachers, principals, and administrators with the information and resources they need to inform and improve their instructional practices, decision-making, and overall effectiveness;

 (ii) Support participating LEAs (as defined in this notice) and schools that are using instructional improvement systems (as defined in this notice) in providing effective professional development to teachers, principals and administrators on how to use these systems and the resulting data to support continuous instructional improvement; and

(iii) Make the data from instructional improvement systems (as defined in this notice), together with statewide longitudinal data system data, available and accessible to researchers so that they have detailed information with which to evaluate the effectiveness of instructional materials, strategies, and approaches for educating different types of students (*e.g.*, students with disabilities, English language learners, students whose achievement is well below or above grade level).

The State shall provide its detailed plan for this criterion in the text box below. The plan should include, at a minimum, the goals, activities, timelines, and responsible parties (see Reform Plan Criteria elements in Application Instructions or Section XII, Application Requirements (e), for further detail). Any supporting evidence the State believes will be helpful to peer reviewers must be described and, where relevant, included in the Appendix. For attachments included in the Appendix, note the location where the attachment can be found.

Recommended maximum response length: Five pages

C.3. Using data to improve instruction

NC is already working to increase the use of instructional data tools in classrooms and the effectiveness with which teachers and principals use these tools to improve student outcomes. Our RttT plan will ensure that every teacher and instructional leader in NC:

- Has ready access to a high quality instructional improvement system containing assessment and data analysis tools and guidance in how to use these tools to improve instructional practices;

- Has professional development that is sufficient to prepare him or her to use the instructional improvement system to address students instructional needs effectively; and

- Develops increasingly effective instructional and leadership practices that use data to improve student outcomes.

Our plan will also build on NC's strong history of providing data for researchers (see Sections C1-2, above) by ensuring that research-relevant data are made easily accessible through the State Longitudinal Data System and the NC Education Research Data Center (Duke Data Center) at Duke University.

C.3.i. Increase the acquisition, adoption, and use of instructional improvement systems

Current Efforts in NC

The effective use of data to improve teaching and learning is so essential to Governor Perdue's *Career and College: Ready, Set, Go!* education reform plan that the Governor has made expanding this capability one of her primary budget priorities in the midst of a very difficult State fiscal environment. NC has recently conducted pilot programs in the use of instructional improvement systems in elementary reading and mathematics. A key part of the pilots has been targeted professional development to prepare teachers and administrators to use the systems effectively. More than 400 schools in NC have participated in piloting the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) early reading diagnostic assessment. During the past year, a selected set of pilot schools have used the Wireless Generation "mClass" technology platform to enhance teachers' use of the DIBELS diagnostic reading assessments. This platform provides teachers with a handheld device to make real-time data collection during classroom activities easier, faster, and more accurate. The data are then synchronized with Web-based software, which provides analyses and reports at the individual student, group, class, grade, and school levels. As part of the system, teachers also have access to web-based tools to help them apply

the data to individualize instruction; administrators similarly have access to tools to track overall progress, review program effectiveness, and inform decisions about instructional resources and strategies. The Wireless Generation system also supports communicating effectively with parents and providing individualized instructional activities for use at home. Another set of pilot sites have been using the *Assessing Math Concepts (AMC) Anywhere* diagnostic assessments, which use similar technology to guide teachers to diagnose students' mathematics understandings and skills, and use the data to develop effective instructional strategies and to differentiate instruction.

The response of students, teachers, administrators, and parents to these technology-supported instructional improvement systems have been very positive, and the early data, along with prior data on the use of these same systems, suggests positive impact on student achievement (detailed analysis will be conducted on end-of-grade test data to be available in June). The positive response in NC has led to Governor Perdue's recommendation that the General Assembly appropriate new funds for the coming year to provide these instructional improvement systems and the related professional development for all elementary school teachers in the lowest achieving elementary schools throughout the State.

Moving Forward: A Statewide NC Instructional Improvement System

To capitalize on the lessons learned in the above pilots, as part of our RttT plan we propose to extend the use of such instructional improvement systems to more grade levels and subject areas, and to all schools in the State, through the provision of a statewide Instructional Improvement System that will yield specific instructionally relevant data for students, parents, teachers, and principals. All NC educators will be able to use the System to characterize accurately individual student learning at different points in time (*e.g.* today, the past month, this semester, this year), levels of specificity (about the entire course of study, units, individual standards, unpacked sub-standards or pre-requisite knowledge or skills) and levels of aggregation (about individual students, groups of students, students in particular buildings, grade-levels or teacher's classes). This comprehensive capability will allow teachers and leaders to develop an increasingly reliable understanding of what students know and are able to do, and to act on that knowledge to improve student outcomes.

All NC teachers and principals will have online access to the Instruction Improvement System via the statewide Learner Management System, a technology platform delivered through the reliable, efficient, and cost-effective Education Technology Cloud (see Section A2). In addition to the cost-efficiencies provided by this approach, having a common statewide System will simplify efforts to provide professional development to all teachers and principals regarding the use of the System tools. While the System will be provided centrally, however, it will enable local adaptations and extensions, such as the selection of specific sets of diagnostic items to use throughout a school or the addition of assessment items to match local curricula. This flexibility will be addressed as part of the core professional development regarding how to use the System.

NC also will endeavor to make the core functionality of the System universally accessible. NC is a member of the Accessible Portable Item Project multi-state consortium, which is developing technology standards for online assessment items and meta-tags. Working within the Accessible Portable Item Project standards and with partner states, NC is committed to developing technology-based assessments that can be: delivered via a wide range of technology platforms, from handhelds to laptops; shared across states to enable collaboration and cost-sharing of development; and enable adaptations to make items accessible for students with special needs.

The NC Instructional Improvement System will provide assessment tools that yield data for the following four distinct instructional purposes:

- *Daily assessments embedded in instructional activities*. Creating a classroom environment in which students receive regular and specific feedback is a key to improving student outcomes. The System will support a variety of types of assessments designed to be embedded in instructional activities. For example, handheld tools and content-specific software like the two described above in the pilot programs will be supported to enable teachers to efficiently record student outcomes in real time. In classrooms equipped with such response tools and a large display device, the System will support activities in which the teacher quickly collects and displays the array of student responses to a question or problem to check students' progress or to stimulate discussions. The System will also enable teachers and students to create digital portfolios of student work (using digital cameras or scanners when

the work is done on paper). In all cases, the System will enable teachers to collect ongoing information to review at the student, group, or class level to track progress, plan instruction, and provide information to students and their parents.

- *Diagnostic assessment based upon learning trajectories*. In order to meet the needs of students - particularly those who are underperforming - teachers need information that provides insights about the students' progress in mastering key concepts and skills, and about student misconceptions that may be interfering with their progress. In other words, teachers need true *diagnostic* information that will enable them to help individual students mitigate their learning difficulties. In the RttT project, we will create a system of diagnostic assessments in mathematics and reading that builds upon the research on cognitive learning trajectories, *i.e.*, the sequences in which students effectively learn a subject area across grades and the concepts and skills that most commonly cause difficulties for students (Heritage, 2008; Confrey, 2009). This component of the Instructional Improvement System will be designed for teachers to use periodically, most often with students who are having difficulties, to pinpoint why a student is struggling and to make individualized instructional decisions based on an accurate, detailed student learning profile. This diagnostic assessment tool will be particularly powerful with students who are significantly below grade-level expectations and for whom grade-level tests are inadequate to provide the diagnostic information teachers need.

- *Curriculum Monitoring*. The System will support regularly checking student assessment data against instructional goals and expected curriculum pacing. The System's curriculum monitoring tools will enable teachers to periodically benchmark the overall progress of individuals, groups, and classes toward mastering the overall standards for the subject and grade. Similarly, these tools will enable instructional leaders to benchmark progress by class, teacher, grade, and subject area, to identify exemplary teachers and effective practices and to identify struggling teachers and provide them with coaching or other supports. These tools will also allow educators to engage students in achieving their learning goals by giving them access to their own progress data and to inform parents about their children's progress, accomplishments and areas for growth.

- *Summative Assessment for Teacher Planning and Student Placement*. The System will incorporate summative assessment data, based on statewide end-of-course assessments and other data, to inform overall planning at the classroom and school level. This

component will use the Educator Value Added Assessment System (EVAAS). As noted in Section C2 and described in greater detail in Section D2, EVAAS is an analytical tool that uses up to five years of historical summative test data to calculate a precise measurement of individual student progress over time, as well as a reliable diagnosis of opportunities for growth. EVAAS can produce reports that predict individual student success on State end-of-grade and end-of-course summative tests, reveal patterns in subgroup performance, and estimate the impact of teachers and schools on student achievement. With this tool, teachers are able to assess student summative assessment data from prior years to see patterns of achievement, growth and areas of potential difficulty, and to plan for grouping students and the effective use of teacher aides and classroom volunteers. EVAAS offers teachers a meaningful look into their own effectiveness with individuals, sub-groups of students, and whole classes. EVAAS is also being used to inform student placement decisions. For example, an EVAAS predictive analysis can be used to estimate the probability that a student is prepared to be successful in Algebra I. EVAAS analyses have shown that 96% of the students predicted to be prepared for success in Algebra I received a passing grade. A related analysis showed that many students who are prepared for success in Algebra I are not enrolling in it, and that this is disproportionally true for minority students. These analyses are leading to an increase in the number of students taking Algebra I (Rivers, 2010). This type of analysis is now being extended to science and AP courses.

Finally, the Instructional Improvement System will provide teachers and principals with the capability to create customizable dashboards that will efficiently and accurately transform the various assessment data into useful information. The dashboard interface will:

- Support educators in developing an increasingly clear, reliable, and actionable picture of individual student performance and change in performance over time;
- Improve understanding of data by allowing users to view different data concurrently displayed in adaptable, easy-to-understand, and meaningful ways;
- Facilitate data-based discussions within and among professional learning communities;

- Set goals for changes in performance expected over time and monitor progress towards the achievement of those goals.

- Support teachers' classroom problem-solving and link to interventions or instructional resources connected to specific problems revealed in the student assessment data, as outlined in Section B3; and

- Draw on other centralized State data collections, to expand analysis capabilities by linking assessment data to key demographic, disciplinary, attendance and other non-academic achievement data

Implementation Timeline and Responsible Parties

NCDPI will implement the instructional improvement system through a phased approach that is interdependent with the development and rollout of the other technology components included as part of the RttT plan (see Section A2). Each component will focus on certain specific content areas, as shown below in Tables 12 and 13.

Table 12: Components of Instructional Improvement System

Component	Subject Areas Planned
Daily Assessments Tools	K-12 All subject areas
Diagnostic Assessments Tools	K-8 Mathematics and Reading. NC will focus the work to define learning trajectories and developing diagnostic assessment items to K-8.
Curriculum Monitoring Assessments Tools	K-12 Reading/English Language Arts, Mathematics, Science and Social Studies.
Summative Assessment Tools	All subject areas with a End-of-Grade or End-of-Course assessment and for all students with at least three years of historical performance data

Table 13: Instructional Improvement System – Timeline

Activity	2010	2011	2012	2013	2014
Establish Learner Management System to support delivery of Instructional Improvement System tools and dashboard interface		Operational Dec 2011			
Define vision and requirements for the Instructional Improvement System	August 2010 – Oct 2010				
Develop and release RFP for necessary portions of the Instructional Improvement System	Sept 2010 – Dec 2011				
Establish Instructional Improvement System through phased approach		Jan 2011 – Dec 2012			
• Develop and deploy daily assessment tool		Jan 2011 – operational Dec 2011			
• Develop and deploy curriculum monitoring (Social Studies and Science) tool		Jan 2011 – operational Dec 2011			
• Develop and deploy curriculum monitoring (Math and ELA) tool		Jan 2011 – operational July 2012			
• Develop and deploy diagnostic assessment (Mathematics) tool		Jan 2011 – operational July 2012			
• Develop and deploy diagnostic assessments (Reading) tool		July 2011 – operational Dec 2012			
• Analyze summative data to inform planning	EVAAS currently available to all schools.				
Evaluate effectiveness of System using student performance targets and user response data		Yearly Analysis, Report to Users, and System Improvement			
Deliver professional development on Instructional Improvement System and develop data-guide (as discussed in Section C3.ii below)		Ongoing (discussed in detail below)			

As described in Section B, NC is also part of the Smarter Balanced Assessment Consortia. If NC competes successfully for the state RttT grants and the consortia assessment grant, we will ensure that the development of the English Language Arts and Math-related content in our Instructional Improvement System does not duplicate the efforts of the consortia, but rather supports and supplements that work.

NC will evaluate the effectiveness of the Instructional Improvement System annually. The evaluation will incorporate summative student performance data. In addition, NCDPI will use analyses of uses within different LEAs, schools, grade levels, and content areas, and System usage metrics and user-feedback to guide ongoing improvements to the System.

C.3.ii. Support participating LEAs schools that are using instructional improvement systems in providing effective professional development

NC will engage in a two-part effort to ensure teachers and leaders can and do use data to improve instruction effectively. The first step is to develop an in-depth guide that clearly defines excellence in data use, and the second step is to train educators, both face-to-face via a cohort of Professional Development Leaders and through the use of online learning modules, to use data effectively to improve outcomes. These steps are described in more detail below.

Develop a data-use guide and in-depth support materials for school leaders, PLCs and individual teachers defining excellence in the use of data to improve instruction.

To build teacher and principal capacity to use data, NC will create a data-use guide that illustrates, using sample instruction grounded in research and vignettes from NC schools, a clear, coherent vision and detailed examples of effective data use. The guide will address data use for school leaders, professional learning communities, and teachers; and focus on the ways in which data can inspire data-drive decision-making, creative problem-solving, and scientific research. The vision in the guide will be grounded in a belief that a teacher's actions profoundly and measurably influence student outcomes.

The data-use guide will include vignettes from schools and teachers who have significantly increased student achievement while transitioning to a data-driven environment. The guide will utilize audio and video, and student and teacher work samples. NCDPI and institutions of higher education will work with practitioners in developing the guide to ensure that it balance research and practice. The guide will provide the content backbone and framework for subsequent statewide professional development about how to use data to improve student outcomes. Some of the key professional knowledge and skills that will be exemplified in the guide appear in the Table 14.

Table 14: Data Use Guide – Sample Knowledge and Skills

Teachers should be able to:

- Use goal-setting and progress monitoring within the classroom to motivate student achievement.

- Connect students to their own data and help them reflect and make meaning from it.

- Use data to identify the most pressing problems or gaps in student performance and take thoughtful, aligned action as a result.

- Use data to reassess and reflect to determine whether actions have had the desired outcome on student performance.

- Continually evaluate the usefulness of assessment data for classes and groups of student and individuals, and gather more and differentiated assessment data when necessary.

- Monitor progress over-time and identify sub-groups that struggle and skills or content that are commonly misunderstood.

- Use data to communicate with parents about student progress.

Professional Learning Communities (PLC; see also Section D5) should be able to:

- Use goal-setting and progress monitoring within the PLC to motivate teachers' use of data.

- Develop common assessments and backwards plan pacing guides, units and lessons.

- Identify different outcomes across different teachers' classes and promote peer observation.

- Develop data-based peer coaching models.

- Adjust curricular materials and instructional interventions to meet student needs.

School Leaders should be able to:

- Use goal-setting and progress monitoring within schools to establish staff expectations for excellence.

- Coach and provide feedback to individual teachers informed by current and longitudinal views of data.

- Differentiate support for teachers and monitor pacing.

- Determine the effectiveness of curriculum and make adjustments based on available resources.

- Communicate with parents, school boards, and the community.

- Place teachers in classes, subjects, and grade-levels where they will be most effective or are most needed.
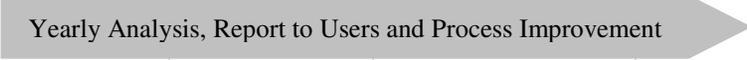
Deploy state-sponsored Professional Development Leaders and design online learning modules to train local teachers and principals to use data effectively to improve instruction

As part of the comprehensive professional development detailed in Section D5, NC will deploy a set of Professional Development Leaders who will serve as data coaches to promote and provide professional development on the effective uses of the statewide Instructional Improvement System. Training teachers and principals to use this System effectively will also be a key component of the preparation and induction programs described in Section D3 and D4, and will be integrated throughout the professional development activities described in Section D5.

Implementation Timeline and Responsible Parties

NCDPI, in partnership with institutions of higher education and PK-12 practitioners, will develop the data-use guides. The Professional Development Leaders discussed in Section D5 will drive design and deployment of modules and face-to-face training regarding use of data to improve instruction. Table 15 illustrates the timeline for completing these activities.

Table 15: Development of Data Use Guides – Timeline

Activity	2010	2011	2012	2013	2014
Develop data guides and multi-media support materials (involve practitioners and, if necessary, a 3rd party contractor.)	■■■	Sept 2010 – Feb 2011			
Design and deploy online learning modules to support best practices in using data to improve instruction, including use of the Instructional Improvement System		■■■■■■■■■■■		Nov 2010 – July 2013	
Deploy Professional Development Leaders to train teachers and principals to use data effectively to inform instruction (includes training on use of the Instructional Improvement System)		■■■■■■■■■		Feb 2011 – July 2013	
Evaluate effectiveness of training and modules using student performance targets and user response data		Yearly Analysis, Report to Users and Process Improvement			

C3.iii. Ensure that data from the instructional improvement systems are made easily accessible to researchers through the State Longitudinal Data System

Since North Carolina's Instructional Improvement System will be centralized, we will be able to seamlessly link the data to the CEDARS longitudinal data system via unique student and staff identifiers and make these data available to researchers in accordance with the Family Educational Rights and Privacy Act (FERPA). This will allow researchers an unprecedented insight into what works in classrooms and will provide NC with valuable information to continually improve the comprehensive assessment system. Through collaboration with researchers, including our current partners at the Duke Data Center, at UNC, and in private universities and colleges, NC will determine key data sets that may be of the most interest for research. NCDPI will then make those data sets available in easy-to-use, linkable format on a yearly basis. In doing so, we will improve upon our existing procedure, through which

for the past decade, the Duke Data Center has made all relevant NC data available to educational researchers both in NC and nationally.

Implementation Timeline and Responsible Parties (Table 16)

NCDPI will be responsible for coordinating and responding to requests for data from the Instructional Improvement System.

Table 16: Researcher Access to Instructional Improvement System – Timeline

Activity	2010	2011	2012	2013	2014
Ensure RFP for Instructional Improvement System and Learner Management System include the ability to link Instructional Improvement System data to statewide longitudinal data system	Sept 2010 – Dec 2011				
Develop Instructional Improvement System with linking capabilities		Jan 2010 – Dec 2012			
Release key data sets of most interest/use to researchers on a yearly basis.		Starting July 2012			
Make data from Instructional Improvement System available to researchers in compliance with FERPA.		Starting July 2012			

Evaluation

Specific questions, data sources, and timelines governing the evaluation of this process are included in Appendix 7.