



## In This Issue...

CCSSO believes its corporate partners can benefit chief state school officers in their work to improve teaching and learning for all children. In order to tap partners' expertise, the Council publishes *Innovation Quarterly* to share partner insights and research.

The articles in this edition of *IQ* provide methods for SEAs to build their capacity, and the capacity of districts, through technology, response to intervention, performance-based teacher assessments, and developmental writing tests. Please see below for a list of articles in this edition of *Innovation Quarterly*.

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## BROADBAND IS QUICKLY BECOMING THE EDUCATIONAL CURRENCY OF THE 21<sup>ST</sup> CENTURY

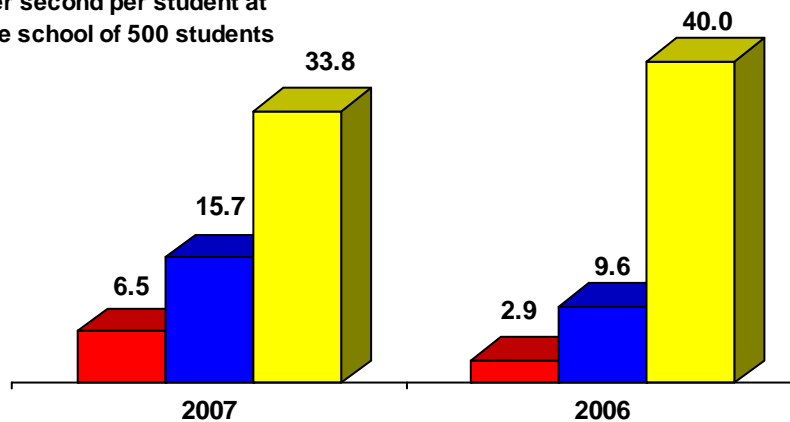
By Lillian Kellogg

Several reports published in the last couple of years have focused on the importance of broadband in education. "America's Digital Schools 2006" report was the first to point out that a broadband crisis was looming for our K-12 schools. Their current report, "America's Digital Schools 2008" (ADS 2008), reinforces their original predictions. This year alone another four reports (see "Resources" below for information on all reports) have been published that directly link high-speed broadband to economic development, global competitiveness, innovation, and achievement in education. The most recent report, "High-Speed Broadband Access for All Kids: Breaking Through the Barriers," published by the State Educational Technology Directors Association (SETDA), aims at bringing this critical issue to a national policy level. It identifies several key issues facing the educational community today relating to robust connectivity and recommends how states and school districts can successfully implement high-speed broadband in their schools. Some key issues are listed below.

- Students need high-speed broadband access in their schools to take advantage of a wide range of new and rich educational tools and resources available for anytime, anywhere learning
- Teachers need high-speed broadband access for professional development and to engage in professional learning communities as well as access new educational resources such as curriculum cadres and education portals
- Administrators need high-speed broadband access to conduct online assessments and to access data for effective decision-making
- Schools need high-speed broadband access to create effective, rigorous, technology-infused learning environments

It is interesting to note that the common theme across each of these reports is that access to high-speed broadband is fundamental to success in education and the country's overall economic growth. Because access to broadband is becoming so important to the education process, more and more state departments of education across the country have played an integral role in the planning, funding, and delivery of broadband services to their schools.

**Kilobits per second per student at an average school of 500 students**



■ Today     
 ■ Three Years from now     
 ■ Five Years from now

(Continued on page 2, "Broadband")

(Continued from page 1, "Broadband")

**America's Schools Are Going Digital**

We see many drivers of change and bandwidth usage in schools—communications, online applications and resources, online courses, distance learning, content, video conferencing, Web 2.0, social networking, games and simulations, professional development, assessment, and data management are just a few. While there are several drivers of change and bandwidth usage, the bottom line is that America's schools are going digital at a prodigious pace.

The "ADS 2008" report surveyed districts across America and outlines the following six trends that are creating the digital revolution in schools:

- Large scale 1:1 implementations are alive and well. Over 27% of school districts report they are involved with 1:1 computing, with more planned for future years.
- Learning Management Systems (LMS) go mainstream. Over 50% of the respondents indicated they are using an LMS with another 19% planning to use one in the future.
- Online assessment is replacing paper and pencil tests. Over 30% of the districts indicated they use online assessment.
- The student "race to mobility" accelerates. The report predicts that more mobile computing devices than desktop computers will be sold into schools.
- Interactive whiteboards come into their own. Whiteboards have moved beyond the adoption stage and are now being viewed as standard equipment.
- Awareness of the Internet bandwidth crisis reveals new concerns. All these trends lead to a significant increase in broadband usage in schools.

Considering all the drivers, our schools are facing a bandwidth crisis with demand outstripping capacity.

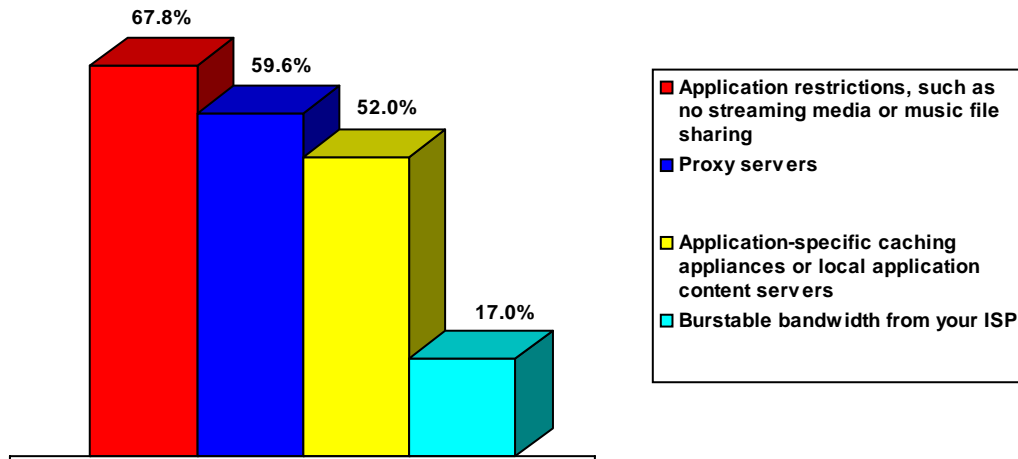
**Bandwidth Growth and Key Concerns**

Several questions illustrated below, posed by the "ADS 2008" report to technology directors from school districts, identify the emerging bandwidth crisis and demonstrate the challenges that school districts face.

**1) What is your total aggregate bandwidth, between all schools and district buildings out to the Internet, via your ISPs? How do you expect bandwidth per student to increase in the future? (see graph on page 1)**

Technology directors indicate that bandwidth requirements will grow at a 39% compound growth rate. Considering the rapid adoption of digital services, the "ADS 2008" report predicts that these numbers may actually be understated, with the requirement more likely 45 Kbps per student. Clearly, for schools to keep up with these increasing demands, scalability is a critical component of any connectivity services.

**2) Have you used any of the following to leverage the existing capacity of your bandwidth? Please check all that apply.**



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# RESPONSE TO INTERVENTION - USING TECHNOLOGY TO ADDRESS INDIVIDUAL STUDENT NEEDS, WITH INDIVIDUAL RESPONSES

By Ellen Haley

Response to Intervention (RTI) has received a lot of attention lately. More than just another buzzword, RTI represents a new approach to teaching that helps guide educators. It is a formalized method of early detection of struggling learners and providing appropriate corresponding educational intervention to those students.

Today's educators face the dilemma of meeting strict achievement mandates while serving a diverse array of students. RTI supports educators by presenting an integrated framework that allows practitioners to take an efficient, systematic approach to help students do their best.

## Successful RTI Models

Though programs vary from district to district, all RTI programs have fundamental elements in common:

- High-quality, research-based classroom instruction
- Assessment – formative and summative
- Tiered instruction
- Parental involvement

## A Multi-Tiered Continuum of Support

CTB/McGraw-Hill has developed a detailed, multi-tiered approach to RTI, supported by a corresponding suite of research-based educational solutions, for screening, assessment and reporting, progress monitoring, instructional intervention solutions, and resources to monitor fidelity of implementation.

Tier 1: Universal Screening and Classroom intervention - Initial identification of students who would benefit from intervention.

Tier 2: Progress Monitoring and Instructional Resources - Discern strengths and areas of instructional need, assess whether or not interventions are working, and evaluate student progress.

Tier 3: Individualized Programs - Intensive and individualized instructional intervention through progress monitoring by Curriculum-Based Measurements (CBMs).

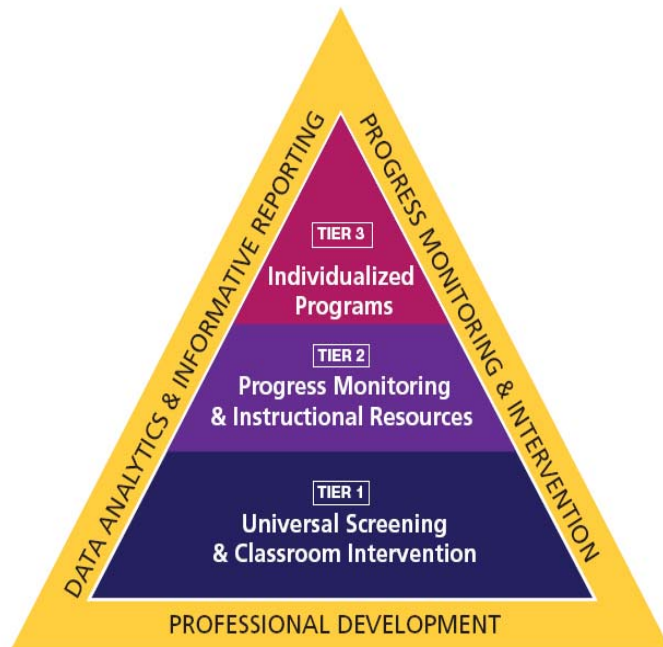
The detailed characteristics of successful RTI programs, and how they can be addressed, include:

### Universal Screening

- Deliver age- and grade-appropriate assessments of student achievement
- Uncover areas of opportunity for additional learning and instruction
- Allow translation of collected data into easy-to-understand and actionable formats

### Tiered Interventions

- Support a multi-tiered program from general screening to highly individualized and targeted needs-based intervention
- Assist educators in data-based decision making



(Continued on page 5, "RTI")

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## 21<sup>ST</sup> CENTURY ASSESSMENT FOR TODAY'S TEACHERS

*By Katherine Bassett*

In 2008, teachers need to be more than just highly qualified. They also need to be highly effective. Realizing this, states will increase their efforts to find ways to measure and improve teacher effectiveness by providing teachers with educative assessments that can help them improve their support of student learning.

That's a focus of our work at ETS. Our Research & Development Division and our new Center for the Study of Teacher Assessment are collaborating with state clients to define teacher effectiveness and develop tools to help states prepare teachers for the classrooms of today and tomorrow.

### Performance-Based Assessments for Practitioners

Educator performance assessments, done correctly, can directly improve effectiveness. Performance assessments reveal not only what current or prospective educators know, but also their ability to apply their knowledge and skills. Most importantly, they help shape professional growth by providing critical insight through diagnostic information.

ETS has produced a test-development methodology called Evidence-Centered Design that creates meaningful, authentic measures of educator performance for individual states. This methodology is used in our collaboration with the California Teacher Credentialing Commission on the design of the California Teaching Performance Assessment (CalTPA).

We also use Evidence-Centered Design in our work with Kansas to create measures of pre-service teacher candidate performance, and with Hawaii to help principals enhance and hone their skills. We have used it in the development of other teacher performance assessments such as Praxis III<sup>®</sup>; in a performance measure used in Arkansas and Ohio; and in our partnership with the National Board for Professional Teaching Standards.

For ETS, the goal of performance assessment is not only to assess, but to be educative as well. We develop these assessments to elicit feedback that can help educators recognize areas of strength and weakness, and thereby inform the selection of professional development to improve teacher practice.

### Formative Assessment

Student assessments can and should do more than ask students to show what they have learned by the end of a course. They should help equip students for the global economy. That is why we are developing assessments that require students to complete comprehensive tasks that demand integration of the array of skills and knowledge so important in the 21st century, including collaborative work, problem solving, and application of skills to real-life problems.

One comprehensive system, which ETS is developing with the Maine Department of Education and the Portland, Maine public schools, applies computer-administered accountability testing over time, making results available to classroom teachers during the school year. Teachers then can use the information to drive their instructional practice.

Creating a more balanced approach to assessment, in which classroom and summative accountability assessments are mutually supportive, results in better measurement of student progress and reinforcement of critical skills.

ETS has also developed a formative assessment system called *Keeping Learning on Track*<sup>®</sup> (KLT). KLT is a professional development program designed to help teachers monitor student learning in real time as it happens, minute to minute and day by day.



*(Continued on page 5, "Performance-based Assessment")*

(Continued from page 4, "Performance-Based Assessment")

**C**reating a more balanced approach to assessment, in which classroom and summative accountability assessments are mutually supportive, results in better measurement of student progress and reinforcement of critical skills.

With KLT, teachers determine whether students understand the concepts covered in the lesson. The teacher uses this evidence of learning to instantly modify his or her approach (e.g., re-teaching the concept, holding a whole-class discussion, or utilizing peer teaching for students who need help).

KLT users and ETS researchers report encouraging results. In one school district with a record of low performance on standardized tests, classrooms that used the program experienced greater performance improvements than classrooms that did not use it. We intend on continuing the research to examine the impact of KLT on students and teachers in a range of contexts.

#### **Collaborating to Redefine Assessment**

ETS researchers are working with professional organizations and associations, state education agencies, and other research organizations in the U.S. and across the globe on developing, piloting, and implementing teaching tools and learning solutions to better prepare and support educators. Our goal is to use innovative assessment practices to impact student learning.

*For information on performance assessment, contact Katherine Bassett, Director of the ETS Center for the Study of Teacher Assessment, [kbassett@ets.org](mailto:kbassett@ets.org) or 609.683.2193.*

*For information on teacher assessment of student performance, contact Cindy Tocci, Director of the ETS Learning & Teaching Research Center, [ctocci@ets.org](mailto:ctocci@ets.org) or 609.734.1200.*

(Continued from page 3, "RTI")

- Provide resources to support differentiated, high-quality instructional activities for all learners, at all levels

#### **Progress Monitoring**

- Deliver formative, diagnostic evaluations and ongoing progress monitoring through CBM research-based products
- Measure specific skills and objectives, and produce graphic displays of results related to specific learning goals
- Provide a data-driven, systematic approach to improving instructional decision-making and improving student performance

#### **Fidelity of Implementation**

- Supply reports that allow educators to closely monitor the effectiveness of instructional interventions
- Allow for ongoing progress monitoring with reports that align to classroom instruction
- Help educators at all levels know whether or not interventions and progress monitoring efforts are tracking toward success

#### **Assessments – a Critical RTI Component**

Assessment and reporting, properly applied, is a good example of functional RTI. CTB/McGraw-Hill's assessment solutions improve the effectiveness of RTI programs by providing measurable achievement data closely aligned with curriculum to support targeted instructional intervention in time to make a difference.

Rather than simply a static measure of performance, digital assessment provides almost instantaneous results, which can be used in dynamic ways to inform and enhance instruction. Test reporting, with online study guides, individualized student reports, and online resources tailored to each student, ensure improved student performance and achievement.

**R**ather than simply a static measure of performance, digital assessment provides almost instantaneous results, which can be used in dynamic ways to inform and enhance instruction.

CTB/McGraw-Hill is applying the latest technology to advance RTI, as well as other segments of education – online classes and distance education, individualized curricula and segmented classes, on-demand access, and more. CTB/McGraw-Hill offers a wide variety of solutions to apply digital technology to the goal of improving education.

*Ellen Haley is president of CTB/McGraw-Hill. For further information, please contact Michelle Jeffers, [michelle\\_jeffers@ctb.com](mailto:michelle_jeffers@ctb.com) or 415 268 5394. You can also read more about RTI initiatives at [www.ctb.com/rti](http://www.ctb.com/rti).*

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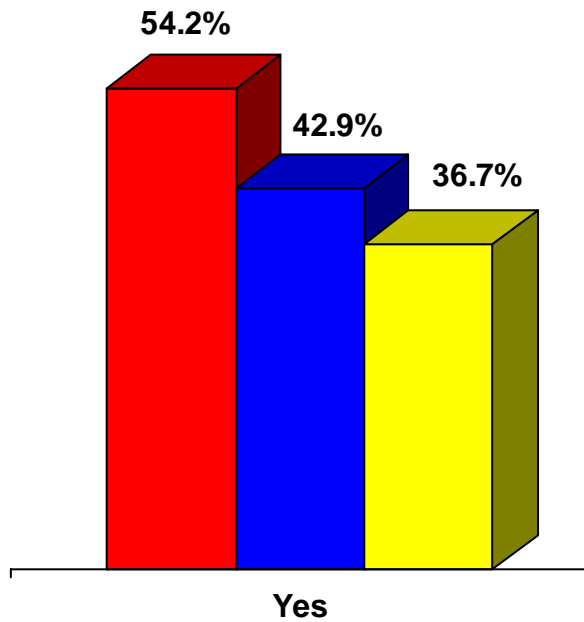
(Continued from page 2, "Broadband")

These responses illustrate that in lieu of getting the bandwidth they need, school districts utilize two primary strategies to deal with increasing demands for bandwidth:

- Restricting access to applications;
- Utilizing caching appliances or local content servers

Both strategies are not sustainable or desired for providing a 21<sup>st</sup> century education. Most agree that restricting media-rich online applications and resources to students and teachers offers a disservice and no long-term strategy. Additionally, utilizing caching appliances or local content servers only applies a short-term "band aid" and circumvents, but does not solve, the problem or meet the growing needs of school districts.

**3) Do you foresee problems with bandwidth funding?**



- Do you foresee a problem obtaining sufficient funding, regardless of the source, for your required bandwidth?
- Do you foresee a problem with E-Rate funding your future bandwidth needs at the current percentages?
- Do you foresee a problem obtaining sufficient bandwidth, regardless of your ability to pay?

Not surprisingly, funding remains a key challenge to school districts. More than 54% of the respondents foresee a problem with obtaining funding for their required bandwidth regardless of the funding source. Almost 43% think that E-Rate will not fund their future bandwidth needs and almost 37% foresee problems getting sufficient bandwidth even if they had sufficient funding. Schools are challenged to do more with less. Fortunately, state education agencies (SEAs) are in the position to help school districts aggregate service and create economies of scale.

**Planning for the Future – Recommendations and Best Practices**

School districts struggle to meet the demands of today’s education environment, and SEAs can help. The first step involves helping schools plan for adequate bandwidth. SETDA recommends the following:

In 2-3 years

- External connection of 10 Mbps per 1,000 students/staff
- Internal WAN connections of 100 Mbps per 1,000 students/staff

In 5-7 years

- External connection of 100 Mbps per 1,000 students/staff
- Internal WAN connections of 1 Gbps per 1,000 students/staff

(Continued on page 7, "Broadband")

(Continued from page 6, "Broadband")

Regardless of the actual requirements, schools need to ensure that whatever they do, their service-delivery plan needs to be scalable to meet future demands.

Secondly, SETDA recommends that to help school districts implement high-speed broadband in schools, K-12 leaders should consider successful statewide K-12 network models as resources as well as other successful district and community implementations. Creating statewide K-12 high-speed broadband networks can create enormous benefits for all school districts by:

- Aggregating demand and creating economies of scale while keeping an element of local control
- Leveraging E-Rate funding
- Providing equitable and reliable high-speed connectivity for all schools
- Deploying mission-critical applications in a cohesive manner
- Leveraging existing infrastructure at the state and local level
- Facilitating network-based safety and security features
- Enabling increased educational opportunities

There are several exemplary models of statewide networks and both the SETDA "High-Speed Access for All Kids" and the "ADS 2008" reports have examples and case studies you can review. The broadband crisis in education is a real challenge, but thankfully there are real and successful solutions for your consideration.

#### Resources

- "High Speed Broadband Access for All Kids: Breaking Through the Barriers," State Educational Technology Directors Association (SETDA), <http://www.setda.org/web/guest/class2020actionplan>
- "A Blueprint for Big Broadband," Educause, <http://net.educause.edu/ir/library/pdf/EPO0801.pdf>
- "America's Digital Schools 2008: The Six Trends to Watch," The Greaves Group/The Hayes Connection, <http://www.ads2006.org/ads/index.php>
- "Networked Nation: Broadband in America 2007," National Telecommunications and Information Administration (NTIA), <http://www.ntia.doc.gov/reports/2008/NetworkedNation.html>
- "The Horizon Report: 2008 Edition," The New Media Consortium/Educause, <http://www.nmc.org/pdf/2008-Horizon-Report.pdf>
- CoSN Broadband Knowledge Center, [www.cosn.org/broadband](http://www.cosn.org/broadband)
- School 2.0 Bandwidth Calculator, [http://etoolkit.org/etoolkit/bandwidth\\_calculator/about](http://etoolkit.org/etoolkit/bandwidth_calculator/about)
- Education Networks of America, [www.ena.com](http://www.ena.com)

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The research collaboration with North Carolina estimated writer ability using the Lexile Writing Analyzer<sup>®</sup>, an automatic essay-scoring engine for establishing Lexile writer measures, and did not investigate convention ability or device fluency.

#### The Developmental Nature of North Carolina's Writing Levels

Holistic scores can be enhanced by reporting an additional metric based on a developmental scale—The Lexile Framework for Writing. To illustrate the power of both a holistic score and a developmental measure of writing ability, MetaMetrics collaborated with NCDPI to re-express growth in semantic and syntactic complexity not captured with the state's holistic scoring model. MetaMetrics linked The Lexile Framework for Writing with NCDPI's rubric scores to convey the developmental differences in words and the combinations of words as measured by the writing framework. The culmination of this process integrated the reporting of student growth in writing ability with North Carolina's achievement levels. As evidenced by the results in Table 1 (see page 1), the potential for doing this integration shows promise. The within-grade Lexile writer measures reflect differences between achievement levels. The mean Lexile writer measures for students in grade four range from 183W at Achievement Level I to 949W at Achievement Level IV. Between grades, the mean Lexile writer measures within each achievement level also reveal developmental differences. For example, students who achieve Level I in grade four write less complex and sophisticated text than students at the same achievement level in grades seven and 10.

#### Summary

The benefits of using The Lexile Framework for Writing for educators and policymakers are important. Lexile writer measures allow policymakers and classroom teachers to monitor status and growth in writer ability. Policymakers can examine growth in writer ability over time as opposed to describing growth as changes in percent of students who meet proficiency. Classroom teachers can immerse developing writers in activities targeted to their individual writing abilities. While the results of the research reported in this article are limited to data provided by NCDPI, the preliminary research findings suggest that its current scoring model—and those of other states—could be successfully linked with The Lexile Framework for Writing.

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## USING A DEVELOPMENTAL SCALE TO ENHANCE REPORTING OF STATE-WIDE, HIGH-STAKES WRITING TESTS

*By Carl W. Swartz, James M. Kroening, and Eleanor E. Sanford-Moore*

Writing at its best (or worst) may be thought of as thinking on paper. In the classroom, students' written words reflect (1) their level of understanding of content; (2) insights about the world around them; and (3) their ability to think creatively and critically about problems.

Earlier this year, the National Assessment of Educational Progress released the results of its 2007 national writing test. While the assessment showed modest increases in the writing skills of lower-performing students, it also revealed that only one third of our nation's eighth-grade students—and less than one-fourth of high school students—are proficient writers. Although these results show improvement since the test was last administered in 2002, they, along with the findings of other influential studies, also show that we still have far to go in helping our students develop the writing skills necessary for academic, career, and personal success.

Last year, MetaMetrics®, Inc. launched The Lexile Framework® for Writing, which describes a student's status and growth in writing ability. The writing framework leverages the same developmental Lexile® scale used to measure reading ability, providing educators with a consistent and straightforward method to monitor growth in reading and writing and reinforcing the importance of reading in developing writing skills. By expressing student writing ability using both a holistic score and a Lexile writer measure (e.g., 850W), educators can better use results from high-stakes writing tests to differentiate classroom instruction and promote growth in writing and convention ability.

### The Lexile Framework for Writing and the North Carolina General Writing Assessment Model

The North Carolina Department of Public Instruction (NCDPI) is at the forefront of providing educators with assessment data to inform writing instruction. Each year, students in grades four, seven and 10 take the North Carolina Writing Assessment, which measures writing proficiency based on responses to a range of prompts from narrative, informative, and persuasive genres. Student's responses are scored by two independent raters based on content (1–4 scale) and conventions (0–2 scale). Each response receives a maximum combined score of eight on content and four on conventions. The student's total writing score is calculated by multiplying the content score by two, then adding the total convention score. A student with a score of 12 or higher is considered proficient in writing.

*Table 1: Illustration of the Developmental Progression of Mean Writing Ability Using Lexile Writer Measures, by Grade and Achievement Level*

| Achievement Level | Grade                     |                            |                            |
|-------------------|---------------------------|----------------------------|----------------------------|
|                   | 4                         | 7                          | 10                         |
| I                 | 183W<br>(sd=170W) (n=231) | 406W<br>(sd=194W) (n=234)  | 527W<br>(sd=220W) (n=239)  |
| II                | 383W<br>(sd=194W) (n=235) | 577W<br>(sd=186W) (n=234)  | 727W<br>(sd=192W) (n=238)  |
| III               | 657W<br>(sd=215W) (n=303) | 823W<br>(sd=229W) (n=313)  | 986W<br>(sd=220W) (n=317)  |
| IV                | 949W<br>(sd=220W) (n=248) | 1208W<br>(sd=229W) (n=188) | 1250W<br>(sd=220W) (n=187) |

The Lexile Framework for Writing takes this holistic scoring process further. It provides educators with an innovative system for assessing status and monitoring growth in three important areas of the developing writer:

- *writer ability*, defined by the complexity of the words written (i.e., semantic) and sophistication of word combinations (i.e., syntactic) to communicate a meaningful message to an often unseen audience;
- *convention ability*, illustrated by the ability to use the rules of written English language (i.e., capitalization, grammar and punctuation rules, and spelling errors); and
- *device fluency*, the speed and accuracy with which students can produce authentic text either with a pencil or pen or keyboard.

*(Continued on page 7, "Writing Assessment")*