

# Utilizing Data & Assessment to Individualize Instruction

*Mary Ann Wolf, PhD*



Water, water, everywhere/Nor  
Water, water, everywhere/Nor  
any drop to drink..." oft-quoted  
lines from Coleridge's "The  
Rime of the Ancient Mariner"

We can understand why some  
might, with good reason, cry  
out, "Data, data, everywhere.  
Too much to let us think!"

*James Popham (January 2009).*  
Education Leadership.



# Individualizing Instruction...

## Teacher Testimonies

### Wireless Generation - Teacher Comments

*“I teach reading to 60 students. To adapt curriculum to their abilities every 10 days, I would need 5 lessons for each lesson and 3 co-teachers.”*

*“If I had an insomniac genius side-kick to provide me with instruction synchronized to my students’ abilities every 10 days, I would finally be able to do my job!”*

*“I teach reading to 72 students. To adapt curriculum to their abilities every 10 days, I would need smaller classes.”*



# Think about the potential...

- Amazon
- Catalogs, coupons, solicitations...
- Google
- Grocery stores



# From Paul Hoss, The Core Knowledge Blog

“The [whole group] delivery system most teachers in this country employ today does not address the individual needs or learning pace of their students... it’s boring our brightest students, and overwhelming many of our slower learners...

Anyone who has spent any time as a teacher comes away from the experience with the obvious conclusion that all kids are different. They know going into a lesson that some kids might already know the lesson about to be presented, some kids are ready to learn it, while others might be close, and still others not even remotely near ready for what’s coming...

Most teachers will insist that whole group instruction does the job, that it meets the needs of most students, and it is the most economical way to run a classroom. **I must respectfully disagree.** It may well be the most economical method for the teacher but it is *not* the best way to meet the needs of individual students in a classroom.”



<http://blog.coreknowledge.org/2009/12/30/paul-hoss-on-individualized-instruction/>

# Teacher Time

What's Possible with and  
without Technology?



# Data & Assessment: The Context

- National/Big Picture Data
- State Longitudinal Data Systems
- District Data Systems
- Instructional Management Systems,  
Learning Management Systems,  
Learning Content Management Systems
- Assessments
- Curriculum and Content



# Big Picture Data

- NCES: <http://nces.ed.gov/>
- School Matters:  
<http://www.schoolmatters.com/schools.aspx/q/page=hm>
- NAEP: <http://nces.ed.gov/nationsreportcard/>
- State Report Cards





# State Longitudinal Data Systems: Data Quality Campaign 10 Elements

1. Statewide Student Identifier
2. Student-Level Enrollment Data
3. Student-Level Test Data
4. Information on Untested Students
5. Statewide Teacher Identifier
6. Student-Level Course Completion (Transcript) Data
7. Student-Level SAT, ACT, and AP Data
8. Student-Level Graduation and Dropout Data
9. Ability to Match Student-Level P-12 and Higher Education Data
10. A State Data Audit System

<http://www.dataqualitycampaign.org/>



# District Data Systems Directly from Forsyth County, GA

- The purpose of the Information Systems department is the implementation and maintenance of information systems to support the data and information needs of the school system; adhering to all state and federal confidentiality and reporting requirements and including the application of legal retention requirements and document disposal.
- The newly created centralized Registration and Records Center combines the creation of student records at enrollment and the archival of documents. Parents and students receive personalized attention at registration and enroll all students within the family, regardless of school level they attend. Utilizing a state-of-the art electronic records management system, student and departmental records are managed according to required records retention guidelines.
- Student Information of active students is maintained within the web-based application Infinite Campus, which provides not only school staff with information for decision-making, but also allows parents to keep up-to-date on their student's important information such as assignments, grades, conduct, and attendance through access to Parent Portal.
- Data from the student information system is utilized by all departments in the district for decision making, i.e., food services, boundary planning and projections, staff allotments, media services, and data profiles for the school and district.

[Forsyth County IT Department Website](#)



## IMS, LMS, etc...

### Goals:

- Improve Achievement
- Increase Opportunity for Individualized Instruction
- Increase Teacher Efficiency and Effectiveness
- Improve Central Office Productivity
- Enhance Parent-Teacher-Student Communication
- Individualize Instruction
- Meet NCLB, State, Federal Reporting Requirements
- \*\*Link Standards, Assessment, Curriculum/Content, and Data Tracking

# A Few of the Products Out There...

- Wireless Generation: Burst Reading, FreeReading, DIBELS
- SchoolNet: Instructional Management Suite
- McGraw Hill: Acuity
- Pinnacle: SIS



**Assessments are...**  
“all those activities undertaken by teachers, and by their students in assessing themselves, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged.”

*Black & William, 1998.*



# 21<sup>st</sup> Century Assessments

- *“Be largely performance-based.* We need to know how students apply content knowledge to critical-thinking, problem-solving, and analytical tasks throughout their education, so that we can help them hone this ability and come to understand that successful learning is as much about the process as it is about facts and figures.
- *Make students’ thinking visible.* The assessments should reveal the kinds of conceptual strategies a student uses to solve a problem.
- *Generate data that can be acted upon.* Teachers need to be able to understand what the assessment reveals about students’ thinking. And school administrators, policymakers, and teachers need to be able to use this assessment information to determine how to create better opportunities for students.
- *Build capacity in both teachers and students.* Assessments should provide frequent opportunity for feedback and revision, so that both teachers and students learn from the process.
- *Be part of a comprehensive and well-aligned continuum.* Assessment should be an ongoing process that is well-aligned to the target concepts, or core ideas, reflected in the standards.”



**“Lorna Earl (2003) distinguishes between assessment *of* learning, assessment *for* learning, and assessment *as* learning.”**

***Carol Ann Tomlinson (January 2008). Education Leadership.***





# Assessments

- Summative Assessments
- Interim Assessments, Benchmark Assessments
- Formative Assessments

# *From a HS History Teacher...*

**“It took years of teaching before I really understood how importance creating and using good assessments are to teaching. Now, when I ask myself the question “What do I want my students to learn?,” I cannot separate that from asking “How will I know they learned it?” The challenge as a teacher is to design creative and effective ways to get this feedback and to use it to inform what I do every day with my kids. And when I do this work with colleagues, this is the richest professional experience I know with the biggest pay-off for kids.”**

*Rob Prufer*

*High School History Teacher, 14 years*

*Nationally Board Certified*

*Bellevue, Washington*



*Alliance for Excellent Education: Achieving the Wealth of Riches*

# Formative Assessment

“Research on the effects of using formative assessments in the classroom shows a powerful effect on student achievement, with effect sizes ranging from 0.40 to 1.76.”

Formative assessments that maximize technology:

- “Increase efficiency when administering an assessment;
- Increase accuracy of the timed components of an assessment;
- Decrease administrative tasks, as the need for data entry is eliminated;
- Improve access to data since assessment information is available immediately upon completion of an assessment; and
- Improve the relevance of the data for teachers.”

From *Wireless Generation: The Role of Formative Assessment in Pre-K through 2nd Grade Classrooms* by Margaret Honey (2007)

[Wireless Generation: Formative Assessment](#)



# To Make Formative Assessment Most Effective...

- *Learning Progressions*
- *Learning Goals and Criteria for Success*
- *Descriptive Feedback*
- *Self- and Peer-Assessment*
- *Collaboration*

CCSSO

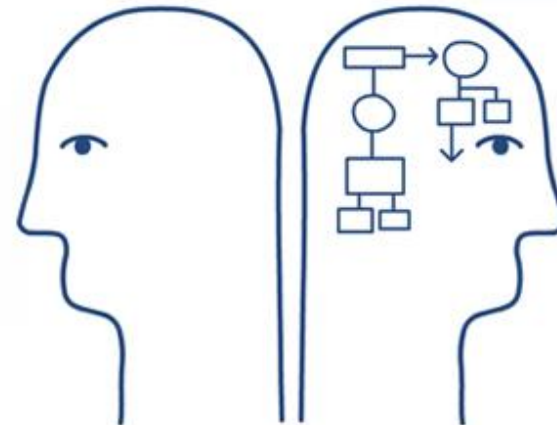
<http://www.ccsso.org/publications/details.cfm?PublicationID=363>



 **Burst® Reading**  
*Early Literacy Intervention*

### Burst® Reading Walkthrough

- Driven by a sophisticated, patent-pending algorithm that works through the night, Burst:Reading is like an insomniac, genius sidekick assigned to each teacher.
- Each teacher's capacity to more effectively help more students to read with comprehension is dramatically amplified.



# Universal Design Applied to Assessment

- Meet the accessibility and accommodation needs of all students
- Save costs in the long-run by building in accommodations rather than retro-fitting assessments as needs arise
- Provide more accurate measurements and data for all students by focusing on *what* you are assessing



# Examples

- Oregon DIBELS: ELL Kindergarten students in Eugene, moved from the lowest level of DIBELS to the highest in 10 weeks . Early readers use MP3 players to develop phonemic awareness and reading fluency.
- Hillsborough, Florida: With the Implementation of an automated benchmark monitoring system resulted in significant student reading skill gains. In second grade, 70% of students identified students at risk of reading failure at the start of the school year were “On Track” for reading success at the end of the year.

[www.setda.org](http://www.setda.org)



# Examples

- Virginia's Algebra Readiness Initiative (ARI)
  - Prepares students for success in algebra through a computer-adaptive test (CAT)
  - Virginia school divisions are eligible for incentive payments for providing math intervention services to students in grades 6-9 who are at-risk of not passing the Algebra I state test
  - Diagnostic test results provide teachers with data to individualize instruction and content for students at-risk
  - Virginia's pilot study (2005-2006) found that Grade 5 students improved over 80 scale score points between the pre and post Algebra Diagnostic Test during the school year
  - Teachers utilized ARI to determine student learning styles and then modify content and instruction. For example, some students prefer using manipulatives or scenarios, while others preferred formulas.

[www.setda.org](http://www.setda.org)



# Examples

- Arizona, Alaska: Formative Assessment Item Banks
- Kentucky: Individual Learning Plans
  - Explore careers beginning in 6<sup>th</sup> grade
  - Creating education plans
  - Developing personal goals and revisiting these as students progress through school
  - Tracking and reflecting on their community services experiences, work experiences, career-planning activities, and extra-curricular and organization activities
  - Exploring colleges and postsecondary opportunities that match their career, postsecondary and life goals
  - Collecting personal information like assessment results, advising activities demographic information and educational history





# Curriculum and Content to Individualize Instruction

- Hybrid or Blended Approach
- Digital Content
- Open Education Resources (OER)
- Personal Devices

# Dr. Robert Marzano on Technology

*“I would have been a much better teacher if I had these technology tools in my middle school classroom.” He said, “Good instruction can happen without it, but technology is a catalyst for good teaching practices such as individualizing instruction for all students, collaborative team work, engaging students with quality content, and providing teachers with data to make informed decisions about improving their instruction.”*



Following a presentation to Ed Tech Leaders, November 3, 2009

[SETDA Press Release](#)

# Instructional Scaffolding

McKenzie (2000) defines instructional scaffolding as curriculum and instruction that contains six characteristics:

- 1) Provides clear direction and reduces students' confusion;
- 2) Clarifies purpose by helping students understand why they are doing the work and why it is important;
- 3) Keeps students on task by providing structure and clear pathways to learning. Students can make decisions about which path to choose or what things to explore along the path but they cannot wander off of the path, which is the designated task;
- 4) Clarifies expectations and incorporates assessment and feedback using models of exemplary work, rubrics, and superior student work samples;
- 5) Points students to worthy sources that reduce confusion, frustration, and time and offers them choices; and
- 6) Reduces uncertainty, surprise, and disappointment by offering multiple routes to success.



*From McKenzie, Jamie (2000). Scaffolding for Success. From Now On: The Educational Technology Journal. <http://fno.org/dec99/scaffold.html>*

**Can We Pay for  
This?**

**What's To Lose?  
What's to Gain?**



# Quantify Problem and Potential Alliance for Excellent Education

In the nation's fifty largest cities and their surrounding areas, 599,755 students dropped out from the Class of 2008. Reducing the number of dropouts by 50 percent for just this single high school class would result in tremendous economic benefits to these regions. The following are three examples of the economic impact that these 299,878 new graduates would have on their local economies:

1. *Increased Wages.* By earning their diplomas these new high school graduates would together earn over \$4.1 billion in additional wages over the course of an average year compared to their likely earnings without a diploma.
2. *Increased Human Capital.* After earning their high school diplomas, many new graduates would not stop there. An estimated 65 percent of these students are projected to continue their education after high school, some earning as high as a PhD or other professional degree.
3. *Additional Tax Revenue.* As these new graduates' incomes grow, local tax revenues will also increase. Annual state and local property, income, and sales tax revenue in these jurisdictions would grow by nearly \$536 million during the average year as the result of increased spending and higher salaries.



# Indianapolis, IN

In the Indianapolis metropolitan area, 6,736 students dropped out from the Class of 2008. Reducing the number of dropouts by 50 percent for just this single high school class would result in tremendous economic benefits to the Indianapolis region. The following are three examples of the economic impact that these 3,368 new graduates would have on Indianapolis and its surrounding area:

1. *Increased Wages.* These new high school graduates would together earn over \$42 million in additional wages over the course of an average year compared to their likely earnings without a diploma.
2. *Increased Human Capital.* An estimated 61 percent of these students are projected to continue their education after high school, some earning as high as a PhD or other professional degree.
3. *Additional Tax Revenue.* Annual state and local property, income, and sales tax revenue would grow by nearly \$5 million during the average year as the result of increased spending and higher salaries.



# Jacksonville, FL

In the Jacksonville metropolitan area, 7,742 students dropped out from the Class of 2008. Reducing the number of dropouts by 50 percent for just this single high school class would result in tremendous economic benefits to the Jacksonville region. The following are three examples of the economic impact that these 3,871 new graduates would have on Jacksonville and its surrounding area:

1. *Increased Wages.* These new high school graduates would together earn over \$48 million in additional wages over the course of an average year compared to their likely earnings without a diploma.
2. *Increased Human Capital.* An estimated 62 percent of these students are projected to continue their education after high school, some earning as high as a PhD or other professional degree.
3. *Additional Tax Revenue.* Annual state and local property, income, and sales tax revenue would grow by over \$3 million during the average year as the result of increased spending and higher salaries.



# Memphis, TN

In the Memphis metropolitan area, 8,053 students dropped out from the Class of 2008. Reducing the number of dropouts by 50 percent for just this single high school class would result in tremendous economic benefits to the Memphis region. The following are three examples of the economic impact that these 4,027 new graduates would have on Memphis and its surrounding area:

1. *Increased Wages.* These new high school graduates would together earn nearly \$41 million in additional wages over the course of an average year compared to their likely earnings without a diploma.
2. *Increased Human Capital.* An estimated 47 percent of these students are projected to continue their education after high school, some earning as high as a PhD or other professional degree.
3. *Additional Tax Revenue.* Annual state and local property, income, and sales tax revenue would grow by over \$4 million during the average year as the result of increased spending and higher salaries.



# Miami, FL

In the Miami metropolitan area, 33,601 students dropped out from the Class of 2008. Reducing the number of dropouts by 50 percent for just this single high school class would result in tremendous economic benefits to the Miami region. The following are three examples of the economic impact that these 16,801 new graduates would have on Miami and its surrounding area:

1. *Increased Wages.* These new high school graduates would together earn nearly \$212 million in additional wages over the course of an average year compared to their likely earnings without a diploma.
2. *Increased Human Capital.* An estimated 59 percent of these students are projected to continue their education after high school, some earning as high as a PhD or other professional degree.
3. *Additional Tax Revenue.* Annual state and local property, income, and sales tax revenue would grow by over \$16 million during the average year as the result of increased spending and higher salaries.



# Nashville, TN

In the Nashville metropolitan area, 6,057 students dropped out from the Class of 2008. Reducing the number of dropouts by 50 percent for just this single high school class would result in tremendous economic benefits to the Nashville region. The following are three examples of the economic impact that these 3,029 new graduates would have on Nashville and its surrounding area:

1. *Increased Wages.* These new high school graduates would together earn nearly \$30 million in additional wages over the course of an average year compared to their likely earnings without a diploma.
2. *Increased Human Capital.* An estimated 48 percent of these students are projected to continue their education after high school, some earning as high as a PhD or other professional degree.
3. *Additional Tax Revenue.* Annual state and local property, income, and sales tax revenue would grow by nearly \$3 million during the average year as the result of increased spending and higher salaries.



# Create Your Own Analysis

	Nashville	Per New Graduate Per Year
Additional Grads	3,029	
Increased Wages	30,000,000	9,904
Additional Tax Revenue	3,000,000	990



# Creating a Culture of Data Use...

1. Make data part of an ongoing cycle of instructional improvement
2. Teach students to examine their own data and set learning goals
3. Establish a clear vision for school-wide data use
4. Provide supports that foster a data-driven culture within the school
5. Develop and maintain a district-wide data system



*IES Practice Guide: Using Student Achievement Data*

# What You Can Do!

- Build a Culture for *Meaningful Data Use*...
- Have the Tools, Resources, and Systems that Make Sense, Are Accessible, and Are Easy To Use
- Build a Robust Data System that Connects to or Includes IMS/LMS, etc.
- Provide Opportunities for High-Quality, Job-Embedded Professional Development
- Develop Common Planning Time
- Think Systemically

