

Title:	Data Use for Teaching: Building Teacher Leaders' Capacity
Created by:	Nancy Gerzon, Susan Janssen, Joseph Sassone, Allen Schenck, and Adam Tanney; New York Comprehensive Center (NYCC) and Margaret Heritage; Assessment and Accountability Comprehensive Center

Audience: Teachers, **instructional coaches, principals, district leaders, state education employees, professional development providers**, local/state board members, higher education faculty, and comprehensive center staff.

Description: Education stakeholders from researchers to the general public are urging K-12 educators to examine data to identify the factors influencing student achievement and strategies to raise achievement. Yet, research shows that the practice of using data to inform action in education is still in its infancy in the United States.

This unpublished article explains how the partnership among Syracuse City School District (SCSD), the New York State Education Department (NYSED), the Assessment and Accountability Content Center (AACC), and the New York Comprehensive Center (NYCC) addressed data use in Syracuse.

The article relates the partnership's view that student learning data should be first and foremost used by teachers. Accordingly, the partnership worked to build district capacity to help teachers get the data they need and use it to improve student learning. The article explains how the NYCC project staff worked directly with the Syracuse math coaches (called ISTs or Instructional Support Teachers) to increase their skills in the use of assessment data, particularly by using protocols.

How it was used: The article was used in two ways. First, NYCC project staff used it with Syracuse district personnel as a stimulus to reflect on and have dialogue for deeper consideration of the work they had previously undertaken. Second, NYCC used the article during professional development sessions with NYSED personnel, both to explicate the work piloted in Syracuse and illustrate how to build skills using data.

Key lessons: NYCC project staff often used only targeted portions of the article during professional development and technical assistance. This proved to be a workable solution for operating within tight time

constraints, provided that NYCC carefully selected the excerpt and gave users adequate context.

Recommendations:

- Use this article when trying to sort out the differences between formative assessment and interim assessments.
- Use this article as a vehicle to explore appropriate level of analysis of interim assessments.

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Nancy Gerzon, Learning Innovations at WestEd and New York Comprehensive Center
(NYCC)

Margaret Heritage, CRESST/UCLA and Assessment and Accountability Comprehensive
Center

Susan Janssen, Education Development Center, Inc. and NYCC

Joseph Sassone, WestEd and NYCC

Allen Schenck, RMC Research Corporation and NYCC

Adam Tanney, RMC Research Corporation and NYCC

DATA USE BY TEACHERS FOR TEACHING: BUILDING DISTRICT CAPACITY

One of the more evident trends in education in recent years is the increasing use of data with the intention of improving student learning. While we agree with the district administrator who said, “You need a lot of data to understand kids” (Wayman and Stringfield, 2006), we also believe that educators need the tools and skills to know what to do with the data once they are collected. In today’s climate of accountability, schools and districts are buried under large amounts of student-level learning data ranging from mandatory summative state assessments to interim assessments to diagnostic, progress monitoring, and curriculum-embedded tests. As if all that were not enough, educators are also urged to examine other types of data, including opportunity to learn and school processes data, to uncover reasons contributing to the achievement results. Yet, research shows that the practice of using data to inform action is still in its infancy in education, a situation reflected in educators’ limited data use skills (Heritage & Yeagley, 2005; Herman & Gribbons, 2001; Ikemoto & Marsh, 2007; Mason, 2001).

The current situation is compounded by the fact that teachers, the people who can use data directly to impact learning, often are the least skilled when it comes to data. Often heard is the call to “get more data into the hands of teachers.” But what data? And how will teachers know what to do with the data when they get them? In this article we describe the first phase of a two year partnership begun in early 2007 among the Syracuse City School District (SCSD), a moderately large urban school district in New York State, the New York State Education Department (NYSED), and the federally funded Assessment and Accountability Content Center (AACC) and the New York Comprehensive Center (NYCC) to seek answers to these questions. The overarching goal of this partnership is to identify and describe the types of support that NYSED can promote and provide to improve teacher data use practices. Taking the view that student learning data should be first and foremost used by teachers, the partnership is working to build district capacity to help teachers, get the learning data they need, and learn how to use data effectively in the service of improved learning.

In the first year the partnership has focused on two key objectives:

1. creating a framework for assessment data use within the school district
2. building the capacity of the district to implement the framework at the school and classroom level.

To build district capacity, the district leadership wanted to leverage existing resources, the Instructional Support Teachers (ISTs), who are responsible for coaching at the building level, and to focus the efforts of the ISTs on fourth and fifth grade mathematics teachers in 11 pilot elementary schools. The intention is to use lessons learned from this small-scale implementation to guide a district wide implementation. The overall strategy for capacity building is for the external partners to work directly with the ISTs over the two-year period to increase their skills in the use of assessment data. The expectation is that the ISTs will be able to readily translate the work done in partner-led professional development sessions to support classroom teachers to implement effective data use practices.

Creating a Framework for Assessment Data Use

The first task of the partnership was to identify existing assessment data sources in SCSD and to clarify expectations for their use. These data sources ranged from the annual statewide student assessments, to data from a newly purchased district-wide interim assessment system, to the data collected from ongoing formative assessment during instruction. From April to October 2007, a team of the external partners met regularly with district-level personnel, including individuals responsible for mathematics instruction, professional development, special education and district data use, and building principals and faculty to share appropriate research from the field, and showcase successful district and school data practices. The meetings were a critical first step in making sense of existing assessment data and resulted in several important outcomes.

First, the district team members came to an agreement that their assessment approach would need to be “coherent”. In other words, their system would need to ensure that all assessments, from large-scale to classroom-level, are aligned with a clear progression of student learning goals. Second, the district team clarified specific data use expectations for all data users. Third, they developed a comprehensive framework (see Figure 1) that clearly communicated district expectations about assessment data use to policy makers, administrators and teachers. The District Assessment Framework (DAF) employs Dylan Wiliam’s (2006) assessment cycle as a frame for assessment data use and specified the kind of assessments relevant to each cycle: a) long cycle, (large-scale and interim assessments); 2) medium cycle (weekly or monthly assessments); 3) short cycle (day-by-day assessment). Finally, they identified the kind of assistance needed to build increased capacity for data use in the district.

Insert Figure 1 about here

Implementing the Framework

To implement the framework, the external partners used three primary approaches during the first year: 1) taught the ISTs to apply common building-level protocols to use with administrators and teachers for analyzing annual state assessment and district interim assessment data; 2) established a common definition of formative assessment and a shared understanding of the value of formative assessment; and 3) facilitated the implementation of formative assessment strategies in the classroom.

Analyzing Annual and Interim Assessment Data

The starting point for the work in data analysis with the ISTs was analyzing and drawing inferences about the long cycle assessment data, annual and interim assessments. The district leadership team recognized that, by their nature, annual large-scale assessment data cannot directly impact classroom instruction on a day-to-day basis, and are better used to provide information about trends in student learning and about strengths and weaknesses of curricula and programs. Likewise, interim assessments cover too long a period of instruction to guide day-to-day teaching and learning, but can be used to monitor progress and identify curricular adjustments that need to be made during the year. The district team also wanted to use the interim assessments as predictors of achievement on

the large-scale tests. The district team's goal was to see these data used well for their appropriate purpose and to ensure that teachers were very much part of the process of using them.

The external partners trained the ISTs to use the annual state assessment and district's interim assessment results to identify strands within the New York State mathematics content standards that warranted focused attention based on relative weaknesses in student performance. Drawing on a data use protocol outlined in WestEd's *Developing an Effective School Plan* (2006), a team of external partners generated four inquiry questions to guide analysis of the annual and interim data:

1. How many students are reported as having taken the interim test in grades 4 and 5 at my school?
2. On the interim assessment, what are the average percentage points obtained at my school in mathematics by strand? How does this compare to the district average?
3. On the interim assessment, on which mathematics strand is student performance on this assessment highest (in my school)? On which mathematics strand is student performance the lowest?
4. Does the interim data align with annual state-level results with regards to strand performance? Which strands are identified as weak (or strong) on both types of assessments?

Before engaging the ISTs in analysis of the data, the partners worked with the district's technology staff to design effective data displays that showed clearly the descriptive data for each of the inquiry questions. The data displays showed mathematical strand analysis by district, school, and grade level for both interim and the statewide tests for the previous two years. The pre-planning of the displays proved to be an essential component in helping the ISTs, and subsequently the teachers, to make sense of the data and be able to answer the inquiry questions.

Using Protocols

The partners taught the ISTs a straightforward protocol for data review through which they write "data statements," or descriptive statements designed to capture key features of the data presented without judgment or bias which addressed the inquiry questions. The protocol also includes the development of "data summary statements" in which key characteristics of the data statements are combined to create a single message about the data and to communicate findings to others. Using this inquiry protocol, ISTs developed data statements that characterized interim and state assessment results by mathematics content and process strand. Subsequently, the ISTs, used the same protocols and inquiry questions with teachers across the 11 elementary pilot schools. The process enabled teachers to identify common areas of strengths and weakness in student performance across mathematics strands, which led to a more in-depth investigation of a number of strands to determine specific areas of students' strengths and weaknesses.

An important by-product of these discussions was the depth of discussion about the mathematics strands, especially the process strands, for example problem solving, reasoning and proof and communication. As a member of the district team noted, "the

process standards have been a challenge. The expansion of the data analysis conversations opened the door for them. For the first time, the process strands became clear to many teachers and administrators.”

Data to Inform Instruction

Defining formative assessment

Having worked with the 11 schools to identify areas of need from the annual and interim assessment data, the next stage of the effort was using learning data to directly inform instruction. This required a focus on formative assessment. The mathematics strands that were identified as weaker from the large-scale data analysis, in particular, were the targets for formative assessment. By targeting the weaker strands, the district leadership wanted to increase teachers’ skilful use of formative assessment and, as a result, improve students’ mathematics learning.

The partners held meetings with the district team, which included district administrators and the ISTs, to develop a common understanding and an agreed upon definition of formative assessment. This work included providing the research base for formative assessment and its potential benefit to student learning, video review of formative assessment practices, and analysis of the definition of formative assessment developed by the Formative Assessment for Students and Teachers (FAST) group of the Council of Chief State School Officers’ (CCSSO). At the end of the discussions on formative assessment the district team decided to use the CCSSO definition as the umbrella for formative assessment in the district:

Formative Assessment is a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students’ achievement of intended instructional outcomes (CCSSO, 2007).

With a clear definition of formative assessment established among the ISTs, the partners then focused their efforts on deepening understanding, and did so using a framework for thinking about some of the essential features of formative assessment which was adapted from Heritage (2007):

- Articulating a clear and coherent learning progression of key mathematics ideas to guide instruction and provide the touchstone for formative assessment
- Identifying the gap between students’ current understanding of mathematics and the desired goals
- Providing descriptive feedback to students about their learning that could help them move forward
- Actively involving students in assessment of their learning

The development of a shared understanding of formative assessment and agreement on how to frame key features of the work led to several outcomes. First, it provided ISTs with a clear understanding of how formative assessment differs from interim assessment and how each type of data could answer different types of questions

about student learning. Second, the dialogue led to an understanding of why formative assessment could be a key improvement strategy in mathematics and helped ISTs advocate for this work. Third, the review of formative assessment research by ISTs led to the development of a set of research-based talking points and facts for ISTs' reference, which helped to support a consistent message about formative assessment implementation across elementary buildings. Finally, the framework provided the big picture of formative assessment and helped them identify the specific aspects of formative assessment that they would incrementally introduce in the schools they were responsible for.

Implementing Formative Assessment Practices

The next step in using data to inform instruction was to help the ISTs take their knowledge into the classroom to work directly with teachers to implement formative assessment practices. The district leaders wanted to ensure that any work in formative assessment at the building level was based on earlier mathematics professional learning so that it would not appear to be “yet another thing” on the part of teachers, but be seen as embedded in their on going work. For example, the district had focused on building teachers' capacity to conduct mathematics discussions using questions with high cognitive demand and to examine student work as a vehicle to understanding students' thinking. Both are valuable formative assessment strategies providing that the information that teachers gain about students' mathematical thinking is used to “form” instruction. However, these previous mathematics professional development sessions, although embodying aspects of formative assessment, had never been put into a larger frame of formative assessment. While the district had implemented practices related to looking at students work in mathematics to identify gaps in learning, up to this point teachers had not focused on what to do, once they identified the gap.

The partners engaged ISTs in a process of analyzing student learning from formative assessment information that the ISTs could use directly on their work with teachers. Effective formative assessment depends on teachers clearly identifying the learning goal and the subgoals that will lead to achieving the goal, so the first job of the partners was to work with the ISTs to map out a clear description of the subgoals, or the pathway along which students would progress, to meet specific mathematical standards for the fourth and fifth grade. Next, they provided sessions focused on the analysis of student work in mathematics that related to the subgoals. In these sessions, the partners introduced protocols to help the ISTs analyze the work to determine the gap between the students' current learning status and the desired subgoals that they had identified in the progression. The protocols also helped support the ISTs to think about how to adapt instruction based on their analyses of student learning. The partners also presented sessions on how to provide feedback to students about the “next step in learning” that would help them move forward to meet the stated learning goal.

In all sessions with the ISTs, the partners modeled formative assessment practices, for example, using a “whip round” technique to assess where the ISTs were in relation to learning how to implement formative assessment and changing their agenda to better reflect the ISTs' learning needs. The partners also modeled the metacognitive processes by talking about how they planned to change their professional development session based on formative feedback from participants, making their internal decision-making processes about how to best meet the lesson goals visible to the ISTs. In this way

ISTs had an opportunity to reflect on the purpose and use of the technique, and the kind of data it produced.

The ISTs developed a good understanding of formative assessment and strategies to help teachers use formative assessment to guide instruction day-by-day. Although the partners and the district leadership recognize that implementing formative assessment practices will take several years, nonetheless, the ISTs have met with some early success, reporting that teachers are both pleased and surprised that they can gather valuable information about students' understanding by using classroom formative assessment techniques throughout their daily instruction.

What Next?

To date, the partnership has made significant progress in increasing the district's capacity to assist teachers in acquiring the necessary skills and practices to use data effectively. The external partners have focused on protocols for analysis of large-scale assessment data, on approaches to formative assessment based on a set of key principles, and on strategies for collecting classroom formative data. But their work is by no means completed. The partnership will continue for another year, with additional schools and teachers in the district with the goal of strengthening teachers' skills in large-scale data analysis, and increasing their skills in using formative assessment data to guide teaching and learning.

As a result of the work of the partnership, the district leadership has identified the importance of a coherent assessment system, in which all assessments are aligned to the same learning standards. Their goal in the next year is to define the standards in clearly articulated learning progressions (K-12) that will serve as the foundation for assessment and instruction.

This partnership has learned that getting data into the hands of teachers can be done, and with the strategic use of external partners to build capacity over a sustained period of time teachers can learn to use data effectively for teaching and for learning.

Figure 1. District Assessment Framework

Assessment Cycle	Assessment Type	Assessment Tools	Expectations for Student Use	Expectations for Teacher Use	Expectations for School or District Use	Professional Development
Continuous or Daily	Formative classroom, instructionally based	Questioning techniques FA practices, such as <ul style="list-style-type: none"> ▪ White boards ▪ Choral response ▪ Exit tickets ▪ Bellwork ▪ Whip around Planned interactions Spontaneous assessments	To self-monitor understanding of the learning goals	To check for level of student understanding of learning goals and revise instruction based on data Decide what comes next in learning	Not applicable	Support ISTs* to define and train grade 4/5 teachers using short-cycle formative assessments to better understand student learning needs Align short cycle formative assessments to learning goals
Weekly or Monthly	Formative classroom Could be "common formative assessments" done by grade level	Weekly or Monthly assessments used formatively including <ul style="list-style-type: none"> ▪ Student work samples ▪ Journals ▪ Essential Questions ▪ Common formatives ▪ Mini performance tasks 	To check progress against learning goals To clarify what has been learned and what learning will take place next	To check for class and individual level of understanding and revise upcoming instruction based on data To identify which students need additional targeted interventions	To provide early identification of students who require targeted student interventions	Support ISTs* to define and develop appropriate medium-cycle assessments that can be used to inform instructional practices Support leadership team to identify and implement structures to support interventions
Unit	Unit testing	End of unit tests	Gauge progress towards meeting grade-level goals or benchmarks	To determine grades and promotion To measure student competency	Grade level and building level analysis of mastery on end of unit tests Analysis and alignment between end of unit tests with state and predictive tests	Support development of data practices that create opportunities to align end of unit testing with other student assessment results
Quarterly	(Predictive) Quarterly Assessments Benchmark testing Interim testing	ACUITY	Gauge progress towards meeting standards	To analyze which students need additional interventions or targeted services, and which can benefit from advanced work	Analysis of trends in student performance across grades, buildings Identify which students are meeting the standards and which are not	Provide and train ISTs* and school leaders to use common protocols for effective analysis and use of district interim assessment data
Annual	NY State Testing	NY State Assessment	Not applicable	To analyze which students need additional interventions or targeted services, and which can benefit from advanced work	To identify broad areas of strengths and weakness, determine which standards have been met, which of these standards students have mastered or are making appropriate progress towards, and in which areas not enough students met the standards	Provide and train leadership to use common protocols for effective analysis and use of annual state assessment (long-cycle) data

* ISTs are instructional support teachers responsible for the training and coaching of teachers.

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