Mining Data

Academy 3: Looking at Student Work to Target Instruction

Participant Handouts

Great Urban Schools: Learning Together Builds Strong Communities

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Academy 3: Looking at Student Work to Target Instruction

I n this Academy, participants learn to examine student work samples to target instruction and link aggregated student work data to make changes school wide.

Module Outcomes

As a result of the activities and information shared at this Leadership Academy, participants will:

- Lead a protocol with faculty on student work samples.

- Assist faculty in defining goals for enhancing their teaching practice with all students.

- Aggregate information from student work sample meetings to identify new targets for professional development, outreach to families and technical assistance to teachers or programs within the building.

Agenda

We constructed this Leadership Academy to occur within a 3-hour timeframe with 15 minutes or so for breaks and other time adjustments. The times listed below are approximate but reflect the time these activities and lecturettes have previously taken. Facilitators should be flexible, read their audience, and work to achieve the overall purpose and outcomes.

TIME	EVENT
15 min	Introductions and Greetings
30 min	Activity 1: Student Work Analysis
20 min	Lecturette 1: Looking at Student Work
25 min	Activity 2: Identifying Patterns in Data to Improve Instructions
10 min	Break
20 min	Lecturette 2: Steps to Improve Data Use
25 min	Activity 3: Gathering Data to Inform Practice
30 min	Leave-taking and Feedback

Student Work Analysis

Student Work Samples:_____

Questions for Reflection	Responses
What do kids understanding?	Sample 1:
	Sample 2:
	Sample 3:
	Sample 4:
	Sample 5:
What don't kids understand?	Sample 1:
	Sample 2:
	Sample 3:
	Sample 4:
	Sample 5:
What stands out?	Sample 1:
	Sample 2:
	Sample 3:
	Sample 4:
	Sample 5:
What are the commonalities?	
What needs for additional instruction or school improvement might arise from these samples?	

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Lecturette 1:
Looking at Student Work

Jeffrey Watson explains…

"Using data is [repetitive]." Educators must have the time and tools to: cycle through steps involving inquiry, acquire data, manage, analyze, apply and evaluate.

(Johnson, J.H. Data-driven School Improvement. ERIC Clearinghouse on Educational Management, 1997)

Conclusions reached through data analysis should be based on multiple sources and measures
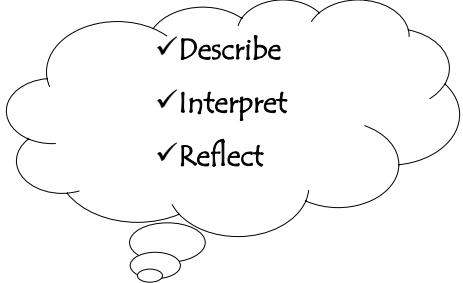

What to multiple sources reveal about student learning and performance?

How to Analyze Multiple Sources of Data for Patterns

✓ Describe
✓ Interpret
✓ Reflect

Are the results expected?

Why or why not?

Are there any surprises?

What results are unexpected?

What anomalies exist?

What areas did the students perform best in?

What weaknesses are evident?

What questions are raised from the data?

How good is good enough?

Of what kinds of student errors do assessments inform us?

⇨ Input

⇨ Output

⇨ Conceptual

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Identifying Patterns in Data

Seeing Patterns and Solutions in Student Work Samples

Students tend to make the same mistakes time and again. If you look for errors over time, you find these patterns. There are several kinds of patterns to look for: input errors, output errors, and conceptual errors. Input errors show that students have a lack of meaning or misunderstand the directions of the project, task or assignment. Output errors may mean the student doesn't grasp the directions or can't fulfill the task for some reason, perhaps lack of resources. Conceptual errors include: lack of background experience, issues with frameworks for understanding, semantic mistakes, procedural confusion, processing troubles, and problem solving difficulties.

Once you see the patterns, you can make a formal assessment to determine exactly what causes the error. Then you can determine what instructional strategy to take. Do you use remedial instruction and once again teach the information or skill the student lacks? Or does the student have the foundation for the knowledge or skill, and do you build upon those strengths to solve the instructional issue? By choosing one of these strategies you determine which role you play in the student's learning. It will be as coach, mentor, or instructor, but always to encourage the student to reach new educational goals.
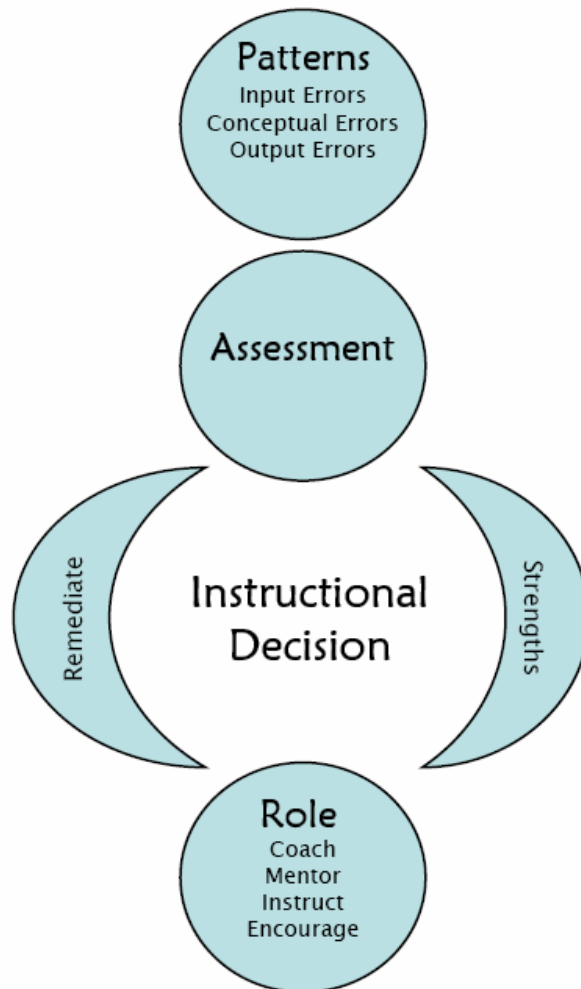
Lecturette 2:
Steps to Improve Data Use

Enhance Credibility and Validity of Assessments

1) Provide safeguards.

2) Make the case.

3) Don't put all of the weight on a single test.

4) Place more emphasis on comparisons of performance from year to year.

5) Consider both value added and status in the system.

6) Recognize, evaluate, and report.

7) Put a system in place.

Robert Linn Educational Researcher March 2000 pp. 4-16 Vol. 29 No. 2

Standards, Assessment, and Instruction

- Are they aligned?
  (Rationale)

- To what extent do teachers understand, teach to, and assess standards consistently?
  (Observe, discuss, listen)

The Knowledge and Skill Level of Staff

- In what ways is ongoing learning embedded into the school and district culture?

- Sit in on and observe patterns of at least 3 grade level team meetings. Look for patterns.

School Culture

- How do staff members demonstrate high expectations for all students?

Who's Teaching and Learning?

- Does the school shift the focus from teaching, to student AND teacher learning?

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1

Questions for Schools to Help Them Use Data Well

- How is time used in the building?
- How often do teachers examine practices?
- What kind of discussions and observations occur?
- What are the mentoring practices?
- How are topics for workshops developed?
- Who does technical assistance?

Study new approaches to meet the needs of all students.

Why look?

There is evidence that examining student work provides benefits for teaching and learning.

The "Evidence Project" developed by Harvard Project Zero
Phi Delta Kappan November, 2003 pp.185-192
Judith Warren Little, Maryl Gearhart, Marnie Curry, Judith Kafka

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Common elements of practice to improve use of data

1. Bring teachers together
2. Get student work on the table
3. Structure the conversation
4. Develop protocols

Stay Focused!

1. Manage tools

2. Apply subject expertise

3. Balance

4. Facilitate

Improving Practice

Improving Practice through Examining Teacher Practice Patterns

Instructional Goal:_____

Questions for Reflection	Responses
How will we know we are successful?	
What challenges do we anticipate?	
What professional development do we need?	
How can we involve families and students in meeting the goal?	
What resources will we need?	

Self Assessment

This is a non-graded, anonymous self-assessment. You have 5 minutes to complete the following questions taken from the content of this academy. After that time the group will have the opportunity to share answers. Note that occasionally we collect these self-assessments to measure the effectiveness of the academy.

1. Describe how student work samples can inform instructional practice and explain how you would use them personally.

2. Explain why it is important to identify patterns in student work samples.

Academy Evaluation

Data Mining Academy 3: Looking at Student Work to Target Instruction

I am a

❍ General Ed Teacher

❍ Administrator

❍ Special Ed Teacher

❍ Parent

❍ Paraprofessional

❍ Other

_____

I am affiliated with a(n):

❍ Elementary School

❍ Middle School

❍ Secondary School

Please let us know how useful you found the topics and activities:

Activity 1: Student Work Analysis

Poor				Great
1	2	3	4	5

Activity 2: Identifying Patterns in Data to Improve Instruction

Poor				Great
1	2	3	4	5

Activity 3: Gathering Data to Inform Practice

Poor				Great
1	2	3	4	5

Self Evaluation

Poor				Great
1	2	3	4	5

Three things I learned that made me go… AH HA!

1. _____

2. _____

3. _____

If I were on the next academy planning team, I would …

As a result of my participation in this academy, I am going to ...

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Resources

Armstrong, J. & Anthes, K. (2001). How data can help. *The American School Board Journal, 188*(11), 38-41.

A study explored how districts can use data more effectively. Data were obtained from six schools in five different states that had reputations as particularly effective users of data. It emerged that districts that make good use of data share several characteristics. These common factors are strong leadership; a supportive district wide culture for using data for continuous improvement; a strong service orientation toward principals and teachers; partnerships with universities, businesses, and nonprofit organizations; a mechanism for supporting and training personnel to use data; close accounting of every student's performance on academic standards; a focused flexibility in how time is used; and a well-defined, data-driven school improvement process.

Brimijoin, K., Marquissee, E., & Tomlinson, C. A. (2003). Using data to differentiate   instruction. *Educational Leadership, 60*(5), 70-73.

Part of a special issue on using data to improve student achievement. An overview of how one teacher uses assessment data to differentiate instruction is presented. The teacher uses multiple methods of data collection and believes her role as data collector is to determine students' prior understanding and achievement, track their responses to moderate challenges, and measure their outcomes against expected performance goals. She uses a wide array of pre-assessments when teaching new content and uses assessment to modify instruction so that each student is appropriately challenged. To prepare for state standards testing, she asks students to select topics that need more work and sets up centers to serve students' needs. In addition, this teacher uses assessment to target learner needs.

Brown, K. & Capp, Robert (2003). Better data for better learning. Leadership, 33(2), 18-19.

A standards-based assessment program at Rocklin Unified School District in Rocklin, California, uses technology to link assessments directly to standards, producing timely reports that teachers and administrators can use to monitor student progress and hone the curriculum. The four steps involved in this program include distributing assessments to students, scanning their answers into the classroom computer, using Web technology to collate the data, and using the data to quickly identify potential areas of concern.

Marzano, R. J. (2003). Using data: Two wrongs and a right. *Educational Leadership, 60*(5), 56-60.

Schools and districts often make two mistakes in their efforts to be data-driven. The first mistake occurs because schools use measures of student learning that are not sensitive to the actual learning occurring in classrooms. The second mistake comes about when a school or district has no system or plan for interpreting and using the data. Education research has revealed 11 student, teacher, and school factors that affect student learning. These are a guaranteed and viable curriculum,

challenging goals and effective feedback, parent and community involvement, a safe and orderly environment, staff collegiality and professionalism, teachers' instructional strategies, classroom management, classroom curriculum design, home atmosphere, learned intelligence and background knowledge, and student motivation. A survey instrument that can be used to identify specific elements for each of the 11 factors that directly affect student achievement is discussed.

Parsons, B. A. (2003). A tale of two schools' data. *Educational Leadership, 60*(5), 66-68.

The different approaches to data collection and analysis that are taken at two school districts are discussed. In the first district, an examination of previous scores is conducted, a goal is set, and individual teachers are left to figure out how to reach this objective. In the second district, a diagnosis is made, a goal is set, a planning system based on program planning and action as well as evaluative inquiry is created, and an Action Team and an Evaluative Inquiry Team is developed for each subject area. The first district reports progress on overall math achievement on a yearly basis, but teachers do not know how to link this information to the variables they can control. However, the second district reports on research-based changes to improve student learning, how levels of implementation of the new methods are linked to progress in student learning, and how teachers are sharpening their instruction.

Popham, J. W. (2003). The seductive allure of data: Using data to improve student achievement. *Educational Leadership, 60*(5), 48-51.

This article examines how teachers can use classroom data to improve teaching and learning, focusing on how to determine if data is reliable and useful. Topics include designing instructionally useful educational tests and analyzing data from standardized achievement tests.

Rudner, L. M. & Boston, C. (2003). Data warehousing: Beyond disaggregation. *Educational Leadership, 60*(5), 62-65.

Schools should consider data warehousing to ensure their data collection and reports comply with the new No Child Left Behind legislation and to provide a more precise tool for improving education. Data warehousing allows educators to use collected data for traditional purposes, to transform mountains of data into useful information, and to help policymakers identify and plan responses to key trends. When well-organized and easily accessible, a data warehouse can provide a wide range of important analyses that use cross-sectional and longitudinal data. Suggestions for building a functional education data warehouse are provided, and the benefits of data warehousing are discussed.

Thomas, R. S. (2003). Conversations that unlock knowledge in our schools. *Principal Leadership, 3*(8), 40-44.

Advice for school principals on how to develop the ability of faculty to discuss significant student learning issues is provided. This advice relates to the need to use several key categories of questions in faculty conversations if a school is to move from data to information to knowledge. These

categories relate to understanding data, analyzing desegregated data, transforming data into information, benchmarking school performance against other schools, and using information to identify root causes of current achievement levels.

Thornburn, M. & Collins, D. (2003). Integrated curriculum models and their effects on teachers' pedagogy practices. *European Physical Education Reviews, 9*(2), 185-209.

There is increasing interest in how philosophy or overarching aims are articulated through the various planning stages to eventual teaching methodology Accordingly, this paper analyses the interrelationship between teaching, learning and assessment through tracking the decision-making chain from teachers' intentions to the assessment of student outcomes. The context employs an integrated curriculum model, which attempts to link improving performance within activities with the development of an underpinning knowledge about performance-related concepts. The paper reports findings from 40 semi-structured and small group interviews with PE teachers and students in a purposeful sample of secondary schools in Scotland, all following a centrally defined integrated curriculum. Results highlight profound disparities in the pedagogy practices teachers adopt in attempting to translate a dictated 'practical experiential' rationale into performance-led practice. Consequently, this paper provides discussion points for the further review of policy and related methodologies.