Education in our times must try to find whatever there is in students that might yearn for completion, and to reconstruct the learning that would enable them autonomously to seek that completion.
—Allan Bloom

Linda Thompson

The term data-driven instruction refers to a teacher's use of the results from various student assessments to plan instruction. Research has shown this process to be an effective way to improve student achievement.

What is required for data-driven instruction?

Several requirements are necessary to achieve good data-driven instruction:

- **Baseline data** that gives a good sense of where students are at the beginning of the year; these data often come from the prior year's state test because schools are held accountable by such tests.
- **Clear goals** for what students are expected to learn and to achieve; these goals are usually related to state standards and grade-level expectations. Goals may also be specific to improved performance on the state test, for example, raising the percentage of students scoring Proficient or higher in mathematics from 67% last year to 84% this year.
- **Regular assessments** across the school year; frequent assessments provide multiple pieces of evidence about student knowledge and skills. Such assessments help to benchmark students' progress across the school year.
- **Well-focused and well-planned instruction** that is based on evidence; these data show what students know and are able to do and what they still need to learn.

What kinds of tests inform data-driven instruction?

You will find that you can use a variety of tests for data-driven instruction, but all of them should be reliable, valid, and aligned to the standards, concepts, and skills students are expected to learn. These standards-aligned tests can include *state tests* and *benchmark tests* that are administered several times each year and cover all standards. You can even use *chapter* or *unit* tests that assess a specific standard or subset of standards.

How do you use the tests to inform instruction?

Start with a Class Summary of Test Results. The Class Summary should report results in terms of the applicable standards and should have specific information about the grade-level expectations and even what the test items addressed. The following sample shows a small portion of a Class Summary and includes percentages of items answered correctly for each skill and the average percentage for each Strand. From a Class Summary, you can identify strands in which students did well and those in which they had difficulty. A plan of instruction can be based on information from a Class Summary.

Class Summary of Test Results

Strand: Reading (64%)
Comprehension
■ Determine a text's main (or major) ideas and how those ideas are supported with details. (80%) ■ Distinguish fact and opinion in various texts. (71%) ■ Find similarities and differences across texts, such as, in treatment, scope, or organization. (44%) ■ Paraphrase and summarize text to recall, inform, and organize ideas. (65%)
Literary Concepts
■ Identify the purposes of different types of texts, such as to inform, influence, express, or entertain. (49%) ■ Recognize the distinguishing features of genres, including biography, historical fiction, informational texts, and poetry. (76%) ■ Understand and identify literary terms, such as title, author, illustrator, playwright, theater, stage, act, dialogue, and scene, across a variety of literary forms (texts). (66%)
Strand: Writing (64%)
Writing process
■ Generate ideas and plans for writing by using such prewriting strategies as brainstorming, graphic organizers, notes, and logs. (79%) ■ Develop drafts by categorizing ideas, organizing them into paragraphs, and blending paragraphs within larger units of text. (69%) ■ Revise drafts for coherence, progression, and logical support of ideas. (69%) ■ Edit drafts for specific purposes, such as to ensure standard usage, varied sentence structure, and appropriate word choice. (39%) ■ Proofread his or her own writing and that of others. (41%)
Inquiry/Research
■ Frame questions to direct research. (34%) ■ Summarize and organize ideas gained from multiple sources in useful ways, such as outlines, conceptual maps, learning logs, and timelines. (42%) ■ Organize prior knowledge about a topic in a variety of ways, such as producing a graphic organizer. (85%)
Evaluation
■ Analyze published examples as models for writing. (92%) ■ Review a collection of written works to determine its strengths and weaknesses and to set goals as a writer. (85%)

What is the process for achieving data-driven instruction?

First: Target areas where students are having difficulty. This is basically a sorting exercise to identify

- **strengths**—areas in which the class as a whole did quite well
- **challenges**—areas in which the class did fairly well but were not strong
- **critical needs**—areas in which the class did not perform well

The sample Class Summary shows that students struggle with finding similarities and differences across texts (in Comprehension) and editing their own work for sentence structure, usage, and word choice (in Writing Process).

The sorting is not based simply on which strands received the highest or lowest scores. It is based on criteria that place class performances into three categories. Typically, you look at the average percentage of all items answered correctly in each strand and apply predetermined criteria. For example:

- Strength: 80% or higher—Most students were able to answer correctly the majority of questions on the tested content.
- Challenge: 65%–79%—Most students had a moderate understanding of the tested content.
- Critical Need: less than 65%—Most students struggled with the tested content.

To select targets for data-driven instruction, start with the Critical Needs strands. In the sample, the strands for Reading (64%) and Writing (64%) both qualify as Critical Needs. Next, you will select standards or grade-level expectations within those strands for intervention. It is usually more effective to target improvement efforts on a limited number of concepts, so focus intervention on two or three areas.

Second: Focus on specific needs. After identifying the Critical Needs strands, *drill down* within a strand. Look at the grade-level expectations and do an item analysis of the skills and concepts.

In the targeted strands, are there specific skills or concepts your students understand? Can you build on instruction using those skills?

Are there specific areas in which students have difficulty? What are the weakest areas? Drilling down inside a strand to specific grade-level expectations or standards in which students are weak will help you clarify what students understand and where they need more instruction.

The *item analysis* provides information about patterns or trends within student competencies and areas of weakness. In the Reading and Writing strands of the sample Class Summary, an item analysis shows that students are not weak in all of the grade-level expectations. Indeed, they are quite strong in some areas. For example, it is apparent that students were relatively strong in mechanical skills, or tasks in which rules could be memorized and applied, but they were weak in applying knowledge to new situations and in synthesizing information. They can identify an adjective but do not understand how to use one to improve their own writing.

Remember that when you review a single strand, you are seeing a sample of the concepts and skills within that domain. It is not possible to assess the full range of skills for every possible grade-level expectation. A test that did so would be too long and inefficient. However, well-chosen samples of the expected skills will provide a general reflection of what students know and can apply in that area.

If they are available, an examination of answer choices can provide additional insights into student understanding. Many test-item distracters are selected because they represent common errors. If many students select a single wrong answer, it can suggest a commonly held misconception. Generally, you should take care not to isolate test items as "fragments" to be taught. This would be teaching to the test, an ineffective and unethical practice. Rather, look for clusters or patterns within the items that help clarify what students know and do not know. This tells you where previous instruction was effective and where more instruction is needed.

Analysis of test data to provide instructional focus can be done for a single test but is more effective when multiple pieces of information are brought to the process. Review student work samples or look across several tests. Has a particular skill or strand been a challenge or critical need over time, on the state test, on other benchmark tests, on basal chapter tests? The more clearly and fully you understand what students know and are able to do, the more easily you can plan effective instruction.

Third: Plan effective instruction. It's not enough to administer and score a test. Teachers must understand what the test results mean in terms of what students know and are able to do. It is not enough to target low-performance strands for improvement without focusing on specific concepts and skills within those strands.

But the real heart of data-driven decision making is instruction. Teachers have to plan, develop, and deliver appropriate lessons to address focal skills and concepts. The results from schools that use a data-driven approach to instruction indicate that it can be an effective way to ensure that students learn standards. The approach helps raise student achievement in the process.

To plan effective instruction, you must first *backmap* the concepts and skills related to student understanding and application. *Backmapping* is analyzing a grade-level expectation to identify the prerequisite skills and knowledge needed to meet the expectation. Information on prerequisite skills can help pinpoint conceptual problems.

Here is an example of backmapping for an expectation from the Comprehension section of the sample Class Summary:

Paraphrase and summarize text to recall, inform, and organize ideas (65%)

- ability to identify key words (nouns and verbs) in text
- ability to identify the main idea of a sentence or paragraph
- ability to order events or statements appropriately
- ability to recognize the relative importance of events or statements

Test results indicate that the class, as a whole, knows how to identify main ideas (Determine a text's main ideas [80%]), which also suggests that they have an understanding of key words. Where they are weak, then, is in their ability to judge relative importance and possibly in their ability to order appropriately the ideas they have identified.

By backmapping a grade-level expectation, skill, or concept, teachers are better able to clarify and simplify what students must know and must be able to do before they begin learning the new grade-level expectation. This information is necessary for building an appropriate instructional sequence.

There are eight elements that provide a framework for *appropriate and effective instruction:*

- **Develop the concepts.** Developing concepts lays a foundation on which students can build their understanding. This is often done using manipulatives, pictorials, or real-life contexts.
- **Begin with what students already know.** New concepts are easier to master when they are anchored to information students already know.
- **Build fluency.** Students are given opportunities to practice newly learned skills and concepts.
- **Relate concepts to problem solving or applications.** When students apply what they have learned to other classroom situations and to real-life situations, they are more likely to retain what they have learned.
- **Encourage students to explain their reasoning.** When students explain their understanding of concepts to others, they clarify their own thinking.
- **Provide for high levels of engagement.** The more students practice and apply skills and concepts in meaningful ways, the more they learn.
- **Incorporate the social nature of learning.** While whole-group instruction and individual work are important, so are partner work and small-group work.
- **Make use of visuals and graphic organizers.** Pictures, charts, story maps, and other visual aids help learners connect to and retain information.

By weaving each element into lesson plans, teachers can increase the chances that students will develop competency in the area that has been targeted for improvement.

Keep in mind that if targeted instruction is actually "reteaching" concepts and skills previously taught, it is important to use different strategies and activities than those used in initial instruction. Repeating the identical instruction a second time is unlikely to produce a better result. Teachers should ask themselves: What will I do differently as a teacher? What will my students do differently as learners?

It is also a good idea to incorporate quick-checks regularly to ensure student understanding. This is most effective when the check is performed daily or almost daily and is incorporated within the regular lesson. For example:

- Have students explain how they solved a problem in different ways or have them summarize a passage they have read. Listen and probe for clarity in student thinking.
- Have students draw a picture or complete a graphic organizer to demonstrate a key concept.
- Assign two related tasks or questions, first a partner task and then an individual task, to check for each student's supported and independent understanding.

At the end of a unit of instruction, consider constructing a mini-test of ten questions or short tasks covering the key concepts, skills, and grade-level expectations. Use the test to determine how students are doing and whether additional whole-group or small-group follow-up is needed.

Note: To build community focus on the importance of data-driven instruction and to allow teachers to share their efforts, encourage them to work in collaborative grade-level or cross-grade groups to complete these steps in the Target, Focus, and Plan process.

How does the cycle for data-driven instruction work?

As you have seen, there are three distinct steps described within the process of data-driven instruction.

1. **Target** strands where student achievement is low.
2. **Focus** on specific needs within those targeted areas.
3. **Plan** instruction to address those needs.

The Target–Focus–Plan process sounds linear, like a 1, 2, 3 sequence, but it is better described as circular. As successive benchmark tests or chapter tests are given, the three steps are repeated. The cycle of Target, Focus, and Plan continually refines the instruction needed to support students' learning of the grade-level standards.

The key elements of the data-driven decision-making cycle is the use of student data as feedback on the effectiveness of instruction. Inherent in the cycle are two questions that lay at the heart of good teaching:

- What evidence do I have that what I am doing is working?
- How will I respond if what I am doing is not working?

What is the role of the administrator?

Administrative support for data-driven instruction is crucial. In your role as a leader, emphasize the importance of using data gained from standardized tests to focus and plan instruction. Set expectations and give ongoing support for the process by providing teachers with appropriate training, preparation time, and mentoring during the learning and implementation process.

As teachers learn to use data to drive their instruction, you will be able to observe indications of their efforts in their preparation for and delivery of instruction. Teachers will have materials that reflect an analysis of the data, notations in lesson plans of targeted learning objectives, and instructional strategies selected to support critical areas of need. (See Appendix I for Data-Driven Instruction Observation Checklist.)

There will be an increasing awareness on the part of the teacher that it is important to be able to explain concepts in multiple ways. Addressing the needs of students with various backgrounds, various learning preferences, and various skill levels gives all students an opportunity to learn and master the new material being taught.

Data-driven instruction is about using the data to identify conceptual gaps and developing instruction to fill them appropriately.

Discussion Points and Questions

Begin involving faculty in discussions about data-driven instruction with these questions and encourage collaboration on their assignment:

- How would you define data-driven instruction?
- What tests can you use to identify with which strands and topics students are having difficulty and with which strands and topics they are successful?
- To help target instruction, we can place students' performances in (1) areas of strength, (2) areas of challenge, and (3) areas of critical need. What percentage of items answered correctly can we establish for each of these?
- What are the basic elements that you typically weave into lesson plans, for example, an element such as "beginning with what students already know"?
- This week, drill down into one strand to see in which grade-level expectations students are weak, backmap areas of critical need to identify prerequisite skills, and plan an appropriate instructional sequence to address students' weaknesses.

Additional Resources

See Appendix I:

- Handout I1: **Data-Driven Instruction Observation Checklist**
- Handout I2: **Classroom Assessment Survey**
- Handout I3: **Checkpoints**

Planning

- ❒ Teacher has collected appropriate data (e.g., standardized tests, benchmark tests, chapter tests, and homework).
- ❒ There is evidence that the teacher has completed a general analysis (identifying content strands that need to be addressed).
- ❒ There is evidence that the teacher has completed an item analysis (identifying specific student expectations that need to be addressed).
- ❒ Lesson plans
  - ❒ include objectives or concepts on the target list
  - ❒ specifically state the purpose or focus of small-group or partner work
  - ❒ include multiple, alternative approaches for concept instruction
- ❒ Classroom is organized to support various kinds of work or instruction (e.g., computer stations, table(s) for small-group work, areas for partner work, and areas for whole-group instruction.

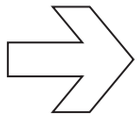
Classroom Instruction

- ❒ There is differentiated instruction to address the needs of students at different levels of learning:
  - ❒ Leveled materials are used with various student groups (i.e., not everyone is in the basal text nor is instruction limited to the basal text).
  - ❒ Students have opportunities for independent work, partner work, group work, and one-on-one time with teacher, as needed.
  - ❒ Direct instruction involves more than one approach or model for each concept that is being taught.
- ❒ There is a high level of student engagement with the assigned work: 80%–90% of students are actively engaged in a lesson that is appropriately challenging*:
  - ❒ Students are on task.
  - ❒ Student discussions are task based.

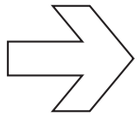
*When students can achieve an 80%–90% success rate with a task, they are more likely to engage with their assigned work. If work is too easy or too difficult, engagement is likely to go down.

Directions In the spaces provided give a brief description of the way you use each type of assessment in your classroom. Then, indicate if there is any additional training you would like to receive in the use of any of these types of assessment.

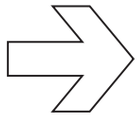
Informal Assessment



Formative Assessment/ Progress Monitoring



Summative Assessment



Is there any additional training you would like to receive in the use of any of these types of assessment? _____

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- Distribute to participants the activity page titled "Checkpoints."
- Discuss as a whole group the importance of monitoring student mastery of learning throughout a unit of study. Ask participants to consider the purposes of formative assessment/progress monitoring.
- Have participants work with a partner to brainstorm ideas for formative assessments that can be used to monitor student performance of content that is taught over a unit of study.

WORKSHOP STRATEGY

Teachers with varied teaching experience and knowledge benefit from sharing various perspectives on teaching and learning. Consider mixing together novice and experienced teachers for this activity.

- Encourage participants first to discuss and record the kinds of informal assessments that allow them to determine to what extent students understand and are making progress toward objectives.
- Ask participants also to consider and record the kinds of formative assessments that can be used to assess mastery of learning goals and objectives.
- Ask partners to form a small group with another set of partners to discuss the assessments they think are effective for each purpose.

Think and Discuss Have participants work in small groups to discuss the importance of giving feedback to students regarding their progress toward learning objectives. What are the purposes of feedback? What methods of feedback do teachers provide for students?

Directions With your partner, discuss and record the informal assessments that allow you to determine to what extent students are progressing toward mastery. Also consider and record the kinds of formative assessments that can be used to assess mastery of learning goals and objectives.

Informal Assessments	***Formative Assessments/ Progress Monitoring***
Ongoing Assessments	

Think and Discuss In your group, discuss the importance of giving feedback to students regarding their progress toward learning objectives. What are the purposes of feedback? What methods of feedback do you provide for students?