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SECTION FOUR
Analyzing Data

How to Use This Module:

The professional development curriculum for *Analyzing Data* may be used in facilitated group sessions or by individuals in self-directed study. To ensure that the professional development curriculum is properly administered, a ***Facilitator's Guide*** and a ***Facilitator's Checklist*** are provided for group sessions, and a ***Self-Directed Learner's Guide*** and a ***Self-Directed Learner's Checklist*** are provided for individuals using the professional development curriculum in the self-paced mode.

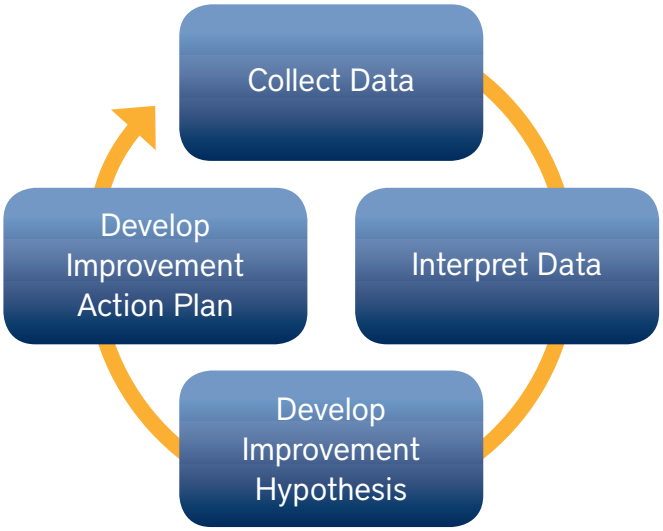
For both methods, three core teaching tools are used: ***Direct Teach*** content, a ***Checking for Understanding Worksheet***, and an ***Application Worksheet***. These core tools are augmented by a variety of materials listed in the ***Section Resources.*** We recommend that you review the content in this section and use the professional development method that best meets your district's or school's needs.

4 Direct Teach

Section Objectives:

1. Develop an understanding of how the process of analyzing educational data supports building and sustaining a data-rich culture.
2. Develop an understanding of the role of formative, common/benchmark, and summative assessment data.
3. Identify and prioritize the questions educational data will answer to inform decision-making at the district, school, and classroom levels for stakeholder groups (for example, teachers, students, and parents).
4. Develop an understanding of cause-and-effect processes.
5. Develop an understanding of the role of using data to support the continuous improvement process.
6. Develop an understanding of the use of data to inform the process of Response to Intervention (RTI).

Section Objective 1: Develop an understanding of how the process of analyzing data supports building and sustaining a data-rich culture.



The process of analyzing data supports and builds a data-rich culture because the analysis process, as well as the data it produces, is a valuable means for guiding decisions made at the district, school, and classroom level. Once schools establish their vision and mission, the data analysis process becomes a monitoring device for ensuring that a district, school, or individual classroom is making progress toward reaching that vision or mission, and on track for a continuous process of school improvement. At all levels, the data analysis process is a cycle. The process begins with data collection, then moves to data interpretation and the formation of hypotheses for improvement, and then to the development of an action plan for improvement. The process is cyclical because the cycle continues with the collection of additional data to evaluate the success of the action plan.

4 Direct Teach

The data analysis process takes on a different focus at the district, school, and classroom levels. At the district and school levels, data analysis works to guide budget decisions, instructional staffing decisions, and, most importantly, students' progress toward meeting academic standards embodied in the district or school's mission. At the classroom level, data analysis works to ensure that data-driven curriculum, instruction, and assessment decisions are aligned with a district's or school's mission and vision.

How a district chooses to use data to impact its operational and education practices is referred to as its data culture. A data-rich culture is influenced by multiple factors, including the district vision, district and school leadership, data coaches and data teams, resources, professional development, and supporting data systems and tools (Hamilton et al., 2009, p. 25). The data analysis process enhances a data-rich culture when it informs instruction; monitors students' progress toward reaching learning targets and standards; and provides information to students, parents, community members, and government agencies. District and school leaders affect a district's or school's data-rich culture by setting priorities, providing resources, and implementing plans they establish for the use of data. Teachers affect the data-rich culture by their ability and commitment to use educational data to inform their instruction and monitor their students' progress toward meeting standards, and their interest in using data to engage their students in the learning process.

The following are suggestions for district and school leaders for enhancing a data-rich culture:

- **Establish a clear vision for school-wide data use.** At the school level, leaders should establish a representative data team to help ensure that the data analysis process is not imposed on educators, but rather is shaped by them. This team should develop a data analysis process and use a plan that is consistent with the vision and mission of the district and school, and is aligned with standards and teaching and assessment methodology. According to recommendations in the *IES Practice Guide: Using Student Achievement Data to Support Instructional Decision-Making* (Hamilton et al., 2009, p. 20-23), school leaders should support the vision for school-wide data use by:
    - Designating a school-based facilitator who meets with teacher teams to discuss the data analysis process and the use of educational data.
    - Dedicating structured time for staff collaboration.
    - Providing targeted professional development regularly.

- **Provide supports that foster a data-rich culture within the district and schools.** District and school leaders should ensure that all stakeholders have a thorough understanding of their roles in the data analysis process, and that they possess the knowledge and skills to implement the data analysis process appropriately. Schools and districts should invest in leadership, professional development, and structured time for collaboration needed for the data analysis process. They also may need to invest in additional resources, including relevant technologies and specialized support staff.

- **Develop and maintain a district-wide data solution.** District and school leaders should ensure that a comprehensive data solution is in place to enable district and school leaders as well as teachers and support staff to access necessary data in a timely fashion. A comprehensive data solution can be a single technology application or a collection of applications and infrastructure that has the ability to link, integrate, analyze, and report disparate forms of data to a range of audiences. District and school administrators should involve a variety of stakeholders in the process for determining which functions, analyses, and reports the data solution should provide.

  At the classroom level, the data analysis process should emphasize collaboration across and within grade levels and subject areas to drive standards-based curriculum, instruction, and assessment, and to provide students with their educational data to monitor their progress toward standards and learning targets. Many of the resources in the *Closing the Gap Professional Development Toolkit* focus on student assessment data because student assessment data is an important source of information for teachers, administrators, students, and parents. However, other forms of educational data are also important to the process of analyzing data to build and sustain a data-rich culture. Looking at how other types of educational data impact student achievement gives educators a better sense of the educational environment and insight into adjustments that need to be made for school improvement purposes. Data teams and Professional Learning Communities (PLCs) have the ability to integrate a variety of data into the data analysis process to identify issues that impact school improvement as well as student achievement.

The following are suggestions for using the data analysis process to develop a data-rich culture at the team and classroom level:

- **Collect data from a variety of sources.** In addition to data from unit tests, projects, classwork, and homework, it is important that the data analysis process include the collection and analysis of classroom performance data in conjunction with widely accessible nonachievement data such as demographic data, which includes gender, ethnicity, income-level, language background, and special needs. While the analysis of

student assessment data makes teaching efforts both effective and efficient, overall averages gathered from student assessment data can hide learning problems of specific subgroups. Thus it is useful when the data analysis process combines student assessment data with demographic data so that student assessment data can be disaggregated by subgroup in order to describe the achievement level of each subgroup assessed. By disaggregating the data from classroom assessments, teachers are able to examine how various subgroups in their classrooms are progressing toward learning targets and standards, and identify subgroups that may be experiencing difficulty with a particular learning target or a particular set of test questions. When teachers take the time to disaggregate student assessment data by subgroup and look at the results, topics for target lessons and next steps for low-achieving subgroups are easily identified. In doing so, the achievement of all students is quickly and efficiently increased, and greater equity is brought to the education students are receiving (Sindelar, 2010, p. 88).

- **Use the data analysis process to inform instructional practices.** Teachers and PLCs should adopt a systematic data analysis process for using data in order to bring evidence to bear on their instructional decisions and improve their ability to meet students' learning needs. Generally, item analysis reports provide information on the identification of assessment questions students have been successful with and those they have not. After examining data using item analysis reports, teachers should interpret the data and develop hypotheses about factors contributing to students' performance and create specific action plans they can use to meet students' needs. Teachers then should test these hypotheses by implementing changes to their instructional practice. Finally, they should continue the data analysis process cycle by collecting and interpreting new student performance data to evaluate their own instructional changes.

Section Objective 2: Develop an understanding of the role of formative, common/benchmark, and summative assessment data.

Formative assessments produce evidence of learning to adapt teaching to meet the immediate learning needs of students by using questions, products, and assessments that are closely tied to a standards-based curriculum. Data from formative assessments is collected minute to minute and day to day. The data is used by teachers, learners, and/or their peers to make decisions about next steps in instruction that are likely to be better than the decisions they would have made in the absence of that evidence (Wiliam, 2011, p. 43). Data from formative assessments help teachers to make microinterventions that may include teaching a target lesson to an entire class, providing special help to individual students, and/or changing instructional pacing or materials in the curriculum.

4 Direct Teach

In tracking student progress over time, such as a grading period or a semester, schools often give benchmark assessments, or common final exams. Benchmark assessments are common assessments in that all teachers of a particular grade or subject give the same assessment at approximately the same time. The use of common benchmark assessments can enhance student achievement of all students because data from common benchmark assessments help teachers and school leaders to identify students' strengths and weaknesses and thus provide specific macrointerventions and resources to remediate the weaknesses.

Benchmark assessments may be both formative and summative. They are summative assessments in that they may serve as a quarter or semester exam and may provide a student a grade. The same benchmark assessment also may be formative in nature in that it provides information to teachers and administrators on how a student or group of students is progressing toward meeting standards. Often benchmark assessments predict how students will fare on state assessments, providing teachers the opportunity to remediate identified academic weaknesses before the student actually takes the assessment.

Summative assessments are assessments *of* learning, which sum up what a student has learned at a particular point in time. An end-of-course or grade assessment, which is used to determine whether a student has mastered the skills and learning necessary to proceed to the next level as well as to assign a final grade, is a summative assessment. Standardized achievement tests also are summative assessments. State-developed achievement tests based on the state or Common Core State Standards also are summative assessments. Summative assessments give district and school leaders as well as state officials a picture of what a student or group of students has learned, and indicate whether students have "exceeded," "met," or are "below" standards.

Formative, benchmark, and summative assessments should complement each other (Sindelar, 2011, p. 71-72). If used correctly, formative, and benchmark assessments provide teachers, students, and school leaders with data to monitor students' progress toward standards and provide interventions to increase student learning. Summative assessments provide assurances to teachers, school district leaders, parents, and community members that the local curriculum and assessments are aligned with standards and levels of achievement outside the district. In other words, formative and benchmark assessments assess student progress toward local learning targets and standards that are being taught to students and provide data that show what students have or have not learned.

Section Objective 3: Identify and prioritize the questions educational data will answer to inform decision-making at the district, school, and classroom levels for stakeholder groups (for example, teachers, students, and parents).

The collection and use of educational data are very much determined by the vision and mission of a district or a school. Generally speaking, a district's or school's vision focuses on where it wants to be in five or 10 years. The mission focuses on the district's or school's purpose. Based on a district's or school's vision and mission, standards or goals for student learning will be established and assessed. Data from the standards-based assessments will inform decision-making at the district, school, and classroom levels.

The *Instructional Data Collection and Use Plan* suggests prioritizing data needs by considering the following criteria:

- Does the data element answer a question that directly supports current and future school, district, state, and national education goals?
- Does the district currently have a means for accurately collecting and displaying the data element across the district?
- Does the district have a means of securely and accurately storing/maintaining the data?

Answering yes to all of these questions makes the data element a strong candidate for inclusion in the plan while data elements that result in a negative response to two or more of these strongly suggests that it should not be included. The data included in this plan will drive district policies, school guidelines, PLC discussion topics and data analysis, education programs, teacher-student-parent conferences, and more. Educational data will inform decision-making at the district, school, and classroom levels for stakeholder groups (teachers, students, and parents).

School boards and superintendents will use educational data to focus on policies and resources necessary to move the vision, mission, and standards-based curriculum forward. They will ask:

- What resources and interventions are needed to move our lowest-achieving subgroups forward?
- Will the interventions meet the requirements of the contract day and the schedule?
- What enrichment can we provide for our high-achievers?
- What are the costs and benefits of these resources and interventions?

4 Direct Teach

Principals and school leaders will be concerned with supporting well-functioning PLCs and data teams. They will look for data-based proposals and recommendations from these groups to again help lower achieving subgroups or provide enrichment for high-achievers. They will ask their teams:

- Based on the data, what resources and interventions do you recommend?
- Why are these resources and interventions being recommended?

Teachers will use the standards-based data to inform their instruction and monitor their students' progress toward standards. They will ask:

- What standards do my students know?
- What standards are they struggling with?
- Are there subgroups that need remediation?
- What are the standards that my subgroups are struggling with?

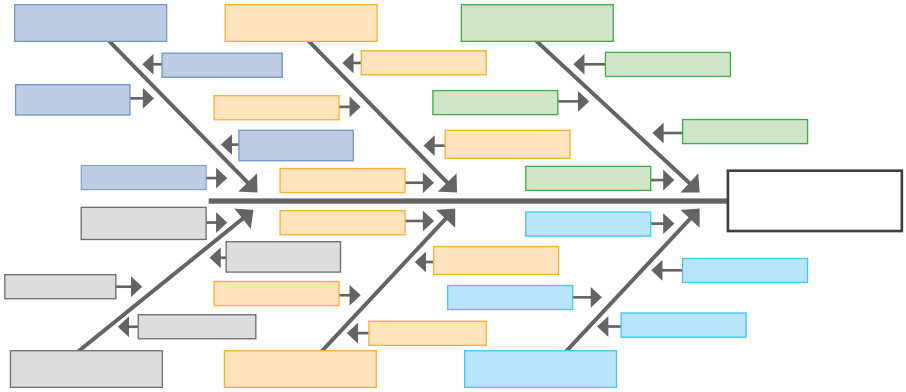
Data will provide meaningful answers and guidance to educators at all levels and will assist them with prioritizing their data needs and addressing specific concerns of stakeholders. (For additional discussion, see the *Instructional Data Collection and Use Plan*.)

Section Objective 4: Develop an understanding of cause-and-effect processes.

Though data teams and PLCs are very effective in identifying the causes of gaps in learning and achievement, thinking about cause and effect can be a helpful means for specifically identifying a problem and then identifying the educational data to improve instruction and determine interventions. A cause-and-effect diagram such as the fishbone diagram is a useful tool for identifying and organizing the known or possible causes of a problem. The structure provided by the diagram helps team members think systemically.

(See fishbone diagram on next page.)

Fishbone Diagram



Completion of a fishbone diagram generally includes two steps. First, identify the problem and place it at the front of the fishbone diagram (white box on the diagram). Next, brainstorm on the causes that are associated with the identified problem and place them on the "spines" of the fishbone diagram (vertical black lines on the diagram). Next, identify associated problems with a specific cause. They can be identified as more fine spines (smaller bones) off the original spine. Specific steps and associated examples for thinking through the cause-and-effect process using a fishbone diagram are provided below.

Steps for thinking through the cause-and-effect process
(http://www.au.af.mil/au/awc/awcgate/navy/bpi_manual/mod5-c-ediag.pdf)

- **Step 1: Identify and define the outcome or effect to be analyzed.** Remember that an effect may be positive, such as a goal or objective, or negative, such as an area of low student achievement.
  Example: Data from geometry formative and summative assessments indicate that geometry students do not understand how to complete word problems.
- **Step 2: Begin drawing the diagram.** Using a flip chart positioned so that everyone can see it, draw the spine and create the effect box. Draw a box around the description of the effect.
  Example: "Low scores on word problems in geometry" is written in the effect box.
- **Step 3: Identify the main causes contributing to the effect being studied.** Write the main categories your team has selected to the left of the effect box, some above the spine and some below it. Draw a box around each category label and use a diagonal line to form a branch connecting the box to the spine.

Examples:

- The textbook does not include definitions of words used.
- ELL students have limited vocabularies.
- Teachers do not discuss or review vocabulary for word problems in class.

- **Step 4: For each major branch, identify other specific factors that may be the causes of the effect.** Identify as many causes or factors as possible and attach them as subbranches of the major branches.

  Examples:

  - The textbook does not include definitions of words used. Specific factor: The word problems don't clearly relate to the geometric formulas.
  - ELL students have limited vocabularies. Specific factor: ELL students do not understand the frame of reference or the context of the questions.
  - Teachers do not discuss or review vocabulary for word problems in class. Specific factors: Teachers feel pressured to cover the curriculum. They don't have time to discuss vocabulary.

- **Step 5: Identify more detailed levels of causes and continue organizing them under related causes or categories.** Ask a series of *why* questions.

  Example:

  Question: Why don't students understand the vocabulary and the context of word problems in geometry?

  Answer: The problems are beyond their vocabulary and their worldview.

- **Step 6: Analyze the diagram.** Look for causes that appear repeatedly. Most importantly, identify and circle the causes on which you can take action.

  Example: Develop an action plan in which geometry teachers take class time to define vocabulary used in word problems, discuss the context in which the problem is set, and show how a word problem relates to a particular geometric formula.

- **Step 7: Reassess.** Reassess students' knowledge of word problems and disaggregate assessment data by subgroup. Then examine assessment data to see if the interventions used in Step 6 were effective for all subgroups or if new interventions need to be put in place.

Section Objective 5: Develop an understanding of the role of using data to support the continuous improvement process.

The continuous improvement process involves "an organizational commitment to ongoing learning and improvement. It is a goal to always get better and an orientation that good is never good enough….It is accomplished through small, incremental advancements that are deliberate and strategic" (Smylie, 2010). When assessment data from standards-based assessments, along with other types of educational data, are collected, analyzed, and used, teachers as well as students have specific information to engage in and monitor the process of continuous improvement. When the data analysis process is used as an ongoing cycle of improvement, teachers have evidence to bear on their instructional decisions and improve their ability to meet students' individual learning needs. After examining data, teachers are able to interpret the data and develop hypotheses about factors contributing to students' performance and create specific action plans they can use to meet students' needs. This becomes an ongoing cycle of continuous improvement when teachers then test their hypotheses by implementing changes to their instructional practice and continue the educational data analysis process cycle by collecting and interpreting new student performance data to evaluate their own instructional changes and monitor the improvement of their students.

When assessment data is used by teachers and students to support and monitor the process of continuous improvement, student achievement may increase rapidly. The data as well as the adjustments to instruction help students understand their next steps for learning, and the continuation of the data analysis process helps students to monitor their progress toward reaching specific learning targets and standards. When teachers review analyzed data, they have a compelling reason to redirect and reassess teaching efforts. When students review their data, they have a compelling reason to take specific next steps and then continue to monitor their progress. The use of analyzed, standards-based assessment data by teachers and students supports the process of continuous improvement and is reinforced by the increase in learning and achievement.

Section Objective 6: Develop an understanding of the use of data to inform the process of Response to Intervention (RTI).

RTI is a data-based decision-making system that can be used for all students in a school. It requires the initiation of strong, researched-based interventions and the collection and analysis of data verifying the impact of the intervention. The goal of RTI is to meet the needs of all students with additional instructional support as soon as it is necessary. The RTI model follows the scientific method, which involves:

- Description of the phenomenon.
- Development of a hypothesis.
- Implementation of the procedure for study and prediction.
- Collection of data and analysis.
- Interpretation of the data and conclusion.

Student performance data is gathered frequently and is immediately available to teachers and school leaders. The data provides information to those delivering instruction as to the effectiveness of that instruction and indicate when instruction must be modified or changed. The data is aligned to state, local, and Individualized Educational Plan (IEP) standards, and tells the teachers whether the student is on track to meet the standards. In general, the IEP provides specific objectives in support of the student being academically successful. If the student is not progressing, teachers must adjust their instructional strategies because the current strategies are not working for the student. By cycling through the process of defining the problem, selecting interventions, and evaluating response to interventions, the educator either finds an effective approach for the student or has built a case for providing more intensive instructional services found in special education (Wedl, 2005).

Another way that data informs the RTI process is through progress monitoring, which is used to assess students' academic performance, to quantify a student's rate of improvement, and to evaluate the effectiveness of instruction. Progress monitoring may be implemented with individual students or an entire class and has four primary objectives:

- To identify students at the beginning of the year who are at risk or who are experiencing difficulties and may need extra instruction or intensive interventions if they are to progress toward grade-level standards by the end of the year, as well as students who have reached benchmarks and who need to be challenged.

- To monitor students' progress during the year to determine whether at-risk students are making adequate progress in critical skills and to identify any students who may be falling behind or need to be challenged.
- To inform instructional planning in order to meet the most critical needs of individual students.
- To evaluate whether the instruction or intervention provided is powerful enough to help all students achieve grade-level standards by the end of each year.

Data analysis and decision-making occur at all levels of RTI implementation and at all levels of instruction. Teams use screening and progress monitoring data to make decisions about instruction, movement within the multilevel prevention system, and disability identification (in accordance with state law). Using data collected from progress monitoring has the following benefits when it is implemented correctly:

- Students learn more quickly because they are receiving more appropriate instruction.
- Teachers make more informed instructional decisions.
- Documentation of student progress is available for accountability purposes.
- Communication about student progress improves between families and professionals.
- Teachers have higher expectations for their students.
- In many cases, there is a decrease in special education referrals.

The identification of, access to, and effective use of data are critical to the success of the RTI process. Data solutions such as Student Information System (SIS), Learning Management System (LMS), and/or assessment systems provide the foundation for access to the data and the subsequent RTI processes.

4 Section Resources

References

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Closing the Gap Templates

Goals Workshop

Instructional Data Collection and Use Plan

Guide to Professional Development and Training Planning: A Focus on SIS/LMS Implementations

District Case Study

Fort Bend Case Study

District Video

Fairfax County Public Schools Video Exemplar

4 Checking for Understanding Worksheet

Direct Teach Reflection: Student assessment data is an important source of information for teachers, administrators, students, and parents. However, other forms of educational data also are important for building and sustaining a data-rich culture. Looking at how other types of data affect student achievement gives educators a better sense of the educational environment and insight into adjustments that need to be made for school improvement.

After reading and reflecting on the *Direct Teach* content, apply what you have learned in the following *Checking for Understanding Worksheet* exercises.

1. How do the suggestions to enhance a data-rich culture influence the decisions of district and/or school leaders?

2. Explain why it is important to disaggregate assessment data for subgroups.

3. How does the prioritization of questions support the identification of educational data and aid in decision-making at the district, school, and classroom levels?

4. What is the role of educational data in the continuous improvement planning process at the district and school levels?

4 Application Worksheet

Direct Teach Reflection: Student assessment data is an important source of information for teachers, administrators, students, and parents. However, other forms of educational data also are important for building and sustaining a data-rich culture. Looking at how other types of data affect student achievement gives educators a better sense of the educational environment and insight into adjustments that need to be made for school improvement.

After reading and reflecting on the *Direct Teach* content and completing the *Checking for Understanding Worksheet*, apply what you have learned in the following *Application Worksheet* exercises.

1. List the major subgroups in your district or school.

2. Which subgroup is the lowest-achieving?

3. Based on the data you have regarding the lowest-achieving subgroup, draw a cause-and-effect diagram that identifies the effect to be analyzed and the possible contributing causes. Then analyze your diagram and develop your action plan for the identified effect.

4. Using Table 1, Data Collection and Use Plan Template, in the *Instructional Data Collection and Use Plan*, identify the types of data, a description, its source, data user, and intended uses of the data that support your school's or district's educational goals.

Meeting Objectives

1. Develop an understanding of how the process of analyzing educational data supports building and sustaining a data-rich culture.
2. Develop an understanding of the role of formative, common/benchmark, and summative assessment data.
3. Identify and prioritize the questions educational data will answer to inform decision-making at the district, school, and classroom levels for stakeholder groups (for example, teachers, students, and parents).
4. Develop an understanding of cause-and-effect processes.
5. Develop an understanding of the role of using data to support the continuous improvement process.
6. Develop an understanding of the use of data to inform the RTI process.

Meeting Preparation

The professional development process for turning educational data into action should be led at every level by a team that pairs an instructional leader with a district- or school-level information technology (IT) leader. These chosen facilitators will participate in the identification of other district, school, and classroom leaders, who will form the Professional Development Facilitation Team. This cadre of professional development facilitators will be responsible for leading professional development at the district, school, and classroom levels. These leaders should consider the vision and goals that the district and schools have for building a data-rich culture prior to administering the professional development curriculum.

To help the participants prepare for the meeting, the facilitators should ask them to complete the following assignments before attending the meeting:

- Read the *Direct Teach* content for Section Four.
- Complete the *Checking for Understanding Worksheet*.
- Read the *Fort Bend Independent School District Case Study*.

Meeting One: Develop an understanding of how the process of analyzing educational data supports building and sustaining a data-rich culture. Develop an understanding of the role of formative, common/benchmark, and summative assessment data.

(Approximate meeting time: 2 hours.)

1. At the beginning of the meeting, review the *Direct Teach* content.
2. Have participants watch the *Fairfax County Public Schools Video Exemplar* and discuss how the teacher is using assessment data from the LMS system to guide his instruction.
3. Then ask participants to share their information from the *Checking for Understanding Worksheet* and explain why it is important to disaggregate assessment data for subgroups. Ask participants to indicate if their disaggregated subgroup data is from formative, benchmark, or summative assessments.
4. Ask participants to complete the *Application Worksheet* and identify the highest and lowest achieving subgroups. Encourage discussion regarding whether the interventions for subgroups are being assessed by formative, benchmark, and summative assessments to determine whether or not the interventions are successful.
5. Since most districts, schools, and teachers have at least some of the programs and resources they need for gathering, analyzing, and disaggregating data, ask participants to share the resources they are currently using in their district or school to gather, analyze, and disaggregate data. Then ask them to brainstorm their goals or next steps for gathering, analyzing, and disaggregating data by district, school, and classroom level. Ask them to identify which resources are in place and what additional resources are needed.
6. Referring to page 11 of the *Guide to Professional Development and Training Planning: A Focus on SIS/LMS Implementations*, ask participants to develop district-, school-, and classroom-level objectives aligned to school or state standards, and possible next steps for gathering, analyzing, and disaggregating data.

Meeting Two: Identify and prioritize the questions educational data will answer to inform decision-making at the district, school, and classroom levels for stakeholder groups (for example, teachers, students, and parents). Develop an understanding of the cause-and-effect processes.

(Approximate meeting time: 2 hours.)

1. At the beginning of the meeting, ask participants to review the district's and school's vision and mission statements, and determine if the curriculum standards and the data being collected are aligned with the vision and mission. Guide the discussion by asking the question, "What standards do we want our students to learn?" If the vision, mission, and standards are aligned, continue to No. 2. If they are not aligned, spend time realigning the vision, mission, and curriculum standards.
2. Ask participants to review the summative data from state assessments and identify the standards students meet and those that are in need of improvement.
3. Then following the instructions for cause-and-effect analysis in the *Direct Teach* section, ask participants to choose a low-achieving subject area as an effect, analyze possible causes for low achievement, and develop an action plan to improve the scores in that subject area.
4. Using Table 1, Data Collection and Use Plan Template, in the *Instructional Data Collection and Use Plan*, review the types of data, a description, its source, data user, and intended uses of the data that supports the participant's school or district's educational goals. Discuss potential answers to each item in the template.

Meeting Three: Develop an understanding of the role of using data to support the continuous improvement process. Develop an understanding of the use of data to inform the RTI process.

(Approximate meeting time: 2 hours.)

1. At the beginning of the meeting ask participants to discuss the *Fort Bend Independent School District Case Study*, giving special emphasis to the statement:

   > This data-driven approach has enabled access to student assessment data in a way that makes progress discussions with students' families more meaningful. In addition, it has yielded a more iterative approach to curriculum development as the district can more closely monitor what is effective and what is not.

2. Since most districts, schools, and teachers have at least some of the programs and resources they need for monitoring students' progress toward standards and "what is effective and what is not," ask participants to share the resources they are currently using to monitors students' progress toward meeting standards. Guide the discussion to determine whether or not data from formative, benchmark, or summative assessments are part of the monitoring process and how the monitoring process is adjusted to meet RTI requirements.

3. Reflect on the *Fort Bend Independent School District Case Study* again. Ask participants to brainstorm by district, school, and classroom level their goals or next steps for "for making progress discussions…meaningful." Ask participants to identify what resources are in place to facilitate the use of data and what additional resources are needed.

4. Then ask participants to develop district-, school-, and classroom-level objectives and possible next steps for the continuous improvement process using the *Goals Workshop* template.

Recommended Answers to Questions Presented in the *Checking for Understanding Worksheet*

QUESTION 1:

How do the suggestions to enhance a data-rich culture influence the decisions of district and/or school leaders?

ANSWER:

At the district and school levels, data analysis works to guide budget decisions, staffing, as well as students' progress toward meeting academic standards embodied in the district's or school's mission. Budgeting is affected by the allocation of resources, including designated school-based facilitators who meet with teacher teams to discuss the data analysis process and the use of data, structured time for staff collaboration, and funds for targeted professional development. Staffing is affected by the addition of data coaches and school-based facilitators as well as data-based decisions requiring additional personnel for RTI interventions that enable students' progress toward meeting academic standards.

QUESTION 2:

Explain why it is important to disaggregate assessment data for subgroups.

ANSWER:

Overall averages gathered from student assessment data often hide learning problems of specific subgroups. Thus, it is useful when the data analysis process combines student assessment data with demographic data so that student assessment data can be disaggregated by subgroup in order to describe the achievement level of each subgroup assessed. By disaggregating the data from classroom assessments, teachers are able to examine how various subgroups in their classrooms are progressing toward learning targets and standards, and identify subgroups that may be experiencing difficulty with a particular learning target or a particular set of test questions. When teachers take the time to disaggregate student assessment data by subgroup and look at the results, topics for target lessons and next steps for low-achieving subgroups are easily identified.

QUESTION 3:

How does the prioritization of questions support the identification of educational data and aid in decision-making at the district, school, and classroom levels?

ANSWER:

The prioritization of questions supports the identification of educational data that will drive district policies, school guidelines, PLC discussion topics and data analysis, education programs, teacher-student-parent conferences, and more. While educational data will inform decision-making at the district, school, and classroom levels for stakeholder groups such as teachers, students, and parents, schools need to be certain they have the technical capability and the human resources capacity to both gather and analyze the data they are seeking. Thus, it is meaningful to prioritize questions that will be answered with data so that available resources will be used effectively.

QUESTION 4:

What is the role of educational data in the continuous improvement planning process at the district and school levels?

ANSWER:

When assessment data from standards-based assessments are collected, analyzed, and used, teachers as well as students have specific information to engage in and monitor the process of continuous improvement. When the data analysis process is used as an ongoing cycle of improvement, teachers have evidence to bear on their instructional decisions and improve their ability to meet students' individual learning needs. After examining data using item analysis reports, teachers are able to interpret the data and develop hypotheses about factors contributing to students' performance and create specific action plans they can use to meet students' needs. This becomes an ongoing cycle of continuous improvement when teachers then test their hypotheses by implementing changes to their instructional practice and continue the data analysis process cycle by collecting and interpreting new student performance data to evaluate their own instructional changes and monitor the improvement of their students.

4 Facilitator's Checklist

Tasks	Target Date for Completion	Status (Not Started, In Progress, Completed)	Person Responsible/Notes
WORKSHOP PREPARATION			
1. Workshop facilitators have been selected: one IT leader and one instructional leader.			
2. A Professional Development Facilitation Team composed of district leaders, school, leaders, and teachers has been selected.			
3. Professional development participants have read the *Direct Teach* content and the *Fort Bend Independent School District Case Study*.			
4. Professional development participants have completed the *Checking for Understanding Worksheet*.			
WORKSHOP EXECUTION			
1. Professional development participants have viewed and discussed the *Fairfax County Public Schools Video Exemplar*.			

Tasks	Target Date for Completion	Status (Not Started, In Progress, Completed)	Person Responsible/Notes
WORKSHOP EXECUTION, *continued*			
2. Professional development participants have shared their information from the *Checking for Understanding Worksheet* and explained why it is important to disaggregate assessment data for subgroups. Participants have indicated if their disaggregated subgroup data is from formative, benchmark, or summative assessments. Participants have shared the resources they are currently using in their district or school to gather, analyze, and disaggregate data. They have brainstormed by district, school, and classroom level their goals or next steps for gathering, analyzing, and disaggregating data. They have identified which resources are in place and what additional resources are needed.			
3. Referring to page 11 of the *Guide to Professional Development and Training Planning: A Focus on SIS/LMS Implementations*, professional development participants have developed district-, school-, and classroom-level objectives aligned to school or state standards, and possible next steps for gathering, analyzing, and disaggregating data.			
4. Professional development participants have reviewed the district's and school's vision and mission statements, and determined if the curriculum standards and the data being collected are aligned with the vision and mission.			
5. Professional development participants have reviewed the summative data from state assessments and identified the standards students meet and those that are in need of improvement.			

Tasks	Target Date for Completion	Status (Not Started, In Progress, Completed)	Person Responsible/Notes
WORKSHOP EXECUTION, *continued*			
6. Following the instructions for cause-and-effect analysis in the *Direct Teach* section, professional development participants have chosen a low-achieving subject area as an effect, analyzed possible causes for low achievement, and developed an action plan to improve the scores in that subject area.			
7. Professional development participants have used Table 1, Data Collection and Use Plan Template, in the *Instructional Data Collection and Use Plan*, to review the types of data, a description, its source, data user, and intended uses of the data that supports the educational goals of the participant's school or district. They have discussed potential answers to each item in the template.			
8. Professional development participants have discussed the *Fort Bend Independent School District Case Study*, giving special emphasis to the statement: This data-driven approach has enabled access to student assessment data in a way that makes progress discussions with students' families more meaningful. In addition, it has yielded a more iterative approach to curriculum development as the district can more closely monitor what is effective and what is not.			
9. Professional development participants have shared the resources they are currently using to monitor students' progress toward meeting standards. They have determined whether or not data from formative, benchmark, or summative assessments are part of the monitoring process and how the monitoring process is adjusted to meet RTI requirements.			

Tasks	Target Date for Completion	Status (Not Started, In Progress, Completed)	Person Responsible/Notes
WORKSHOP EXECUTION, *continued*			
10. Professional development participants have reflected on the *Fort Bend Independent School District Case Study* again and have brainstormed by school and by classroom level their goals or next steps "for making progress discussions...meaningful." They have identified resources that are in place to facilitate the use of data and what additional resources are needed.			
11. Professional development participants have developed district-, school-, and classroom-level objectives and possible next steps for monitoring the continuous improvement process using the *Goals Workshop* template.			

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SECTION FOUR

Self-Directed Learning Materials

Enclosed are a ***Self-Directed Learner's Guide*** and a ***Self-Directed Learner's Checklist***. These supplemental tools provide customized instructions for individuals choosing to use the *Toolkit* in self-directed study. The materials are designed to be used in conjunction with the ***Direct Teach*** content, ***Checking for Understanding Worksheet***, and ***Application Worksheet*** included in this section.

4 Self-Directed Learner's Guide

Learning Objectives:

1. Develop an understanding of how the process of analyzing educational data supports building and sustaining a data-rich culture.
2. Develop an understanding of the role of formative, common/benchmark, and summative assessment data.
3. Identify and prioritize the questions educational data will answer to inform decision-making at the district, school, and classroom levels for stakeholder groups (for example, teachers, students, and parents).
4. Develop an understanding of cause-and-effect processes.
5. Develop an understanding of the role of using data to support the continuous improvement process.
6. Develop an understanding of the use of data to inform the RTI process.

Step One: Develop an understanding of how the process of analyzing educational data supports building and sustaining a data-rich culture. Develop an understanding of the role of formative, common/benchmark, and summative assessment data.

1. Read *Direct Teach* content for Section Four and the *Fort Bend Independent School District Case Study*. Complete the *Checking for Understanding Worksheet*.

2. Watch the *Fairfax County Public Schools Video Exemplar* and reflect on how the teacher is using assessment data from the LMS system to guide his instruction.

3. Complete the *Checking for Understanding Worksheet* and consider why it is important to disaggregate assessment data for subgroups.

4. Complete the *Application Worksheet*.

5. Following the instructions for cause-and-effect analysis in the *Direct Teach* content, choose a low-achieving subject area to analyze possible causes for low achievement. Then develop an action plan to improve test scores in that subject area.

6. Develop a list of resources currently being used in your district or school to gather, analyze, and disaggregate data. Then develop goals or next steps for gathering, analyzing, and disaggregating educational data, and identify which resources are in place and what additional resources may be needed.

7. Referring to page 11 of the *Guide to Professional Development and Training Planning: A Focus on SIS/LMS Implementations*, develop district-, school-, and classroom-level objectives aligned to school or state standards and possible next steps for gathering, analyzing, and disaggregating data.

8. Then using the *Goals Workshop* template, develop district-, school- or classroom-level objectives and possible next steps for gathering, analyzing, and disaggregating data by subgroup.

Step Two: Identify and prioritize the questions educational data will answer to inform decision-making at the district, school, and classroom levels for stakeholder groups (for example, teachers, students, and parents). Develop an understanding of the cause-and-effect processes.

1. Review your district's or school's vision and mission statements and determine if the curriculum standards and the data being collected are aligned with the vision and mission. Consider the question, "What standards do we want our students to learn?" If the vision, mission, and standards are aligned, continue to No. 2. If they are not aligned, spend some time thinking about the steps that need to be taken to realign the vision, mission, and curriculum standards.

2. Review the summative data from your state assessments and identify the standards on which students do well and those that are in need of improvement.

3. Then following the instructions for cause-and-effect analysis in the *Direct Teach*, choose a low-achieving subject area as an effect, analyze possible causes for low achievement in this subject area, and develop an action plan to improve the scores in that subject area.

4. Using Table 1, Data Collection and Use Plan Template, in the *Instructional Data Collection and Use Plan*, review the types of data, a description, its source, data user, and intended uses of the data that supports your school's or district's educational goals. Discuss potential answers to each item in the template.

Step Three: Develop an understanding of the role of using data to support the continuous improvement process. Develop an understanding of the use of data to inform the RTI process.

1. Review the *Fort Bend Independent School District Case Study*, giving special emphasis to the statement:

   > This data-driven approach has enabled access to student assessment data in a way that makes progress discussions with students' families more meaningful. In addition, it has yielded a more iterative approach to curriculum development as the district can more closely monitor what is effective and what is not.

2. Reflect on the resources for monitoring students' progress toward standards and determining "what is effective and what is not" that currently are in place in your district or school. Consider whether or not data from formative, benchmark, or summative assessments are part of the monitoring process and how the monitoring process is adjusted to meet RTI requirements.

3. Reflect on the *Fort Bend Independent School District Case Study* again, and list objectives or next steps for "for making progress discussions…meaningful." Identify what resources are in place to facilitate the use of educational data and what additional resources may be needed in your district or school.

4. Then using the *Goals Workshop* template, develop district-, school-, or classroom-level objectives and possible next steps for gathering, analyzing, and disaggregating data in order to monitor students' progress toward meeting standards.

Recommended Answers to Questions Presented in the *Checking for Understanding Worksheet*

QUESTION 1:

How do the suggestions to enhance a data-rich culture influence the decisions of district and/or school leaders?

ANSWER:

At the district and school levels, data analysis works to guide budget decisions, staffing, as well as students' progress toward meeting academic standards embodied in the district or school's mission. Budgeting is affected by the allocation of resources, including designated school-based facilitators who meet with teacher teams to discuss the data analysis process and the use of data, structured time for staff collaboration, and funds for targeted professional development. Staffing is affected by the addition of data coaches and school-based facilitators as well as data-based decisions requiring additional personnel for RTI interventions that enable students' progress toward meeting academic standards.

QUESTION 2:

Explain why it is important to disaggregate assessment data for subgroups.

ANSWER:

Overall averages gathered from student assessment data often hide learning problems of specific subgroups. Thus, it is useful when the data analysis process combines student assessment data with demographic data so that student assessment data can be disaggregated by subgroup in order to describe the achievement level of each subgroup assessed. By disaggregating the data from classroom assessments, teachers are able to examine how various subgroups in their classrooms are progressing toward learning targets and standards, and identify subgroups that may be experiencing difficulty with a particular learning target or a particular set of test questions. When teachers take the time to disaggregate student assessment data by subgroup and look at the results, topics for target lessons and next steps for low-achieving subgroups are easily identified.

QUESTION 3:

How does the prioritization of questions support the identification of educational data and aid in decision-making at the district, school, and classroom levels?

ANSWER:

The prioritization of questions supports the identification of educational data that will drive district policies, school guidelines, PLC discussion topics and data analysis, education programs, teacher-student-parent conferences, and more. While educational data will inform decision-making at the district, school, and classroom levels for stakeholder groups such as teachers, students, and parents, schools need to be certain they have the technical capability and the human resources capacity to both gather and analyze the data they are seeking. Thus, it is meaningful to prioritize questions that will be answered with data so that available resources will be used effectively.

QUESTION 4:

What is the role of educational data in the continuous improvement planning process at the district and school levels?

ANSWER:

When assessment data from standards-based assessments are collected, analyzed, and used, teachers as well as students have specific information to engage in and monitor the process of continuous improvement. When the data analysis process is used as an ongoing cycle of improvement, teachers have evidence to bear on their instructional decisions and improve their ability to meet students' individual learning needs. After examining data using item analysis reports, teachers are able to interpret the data and develop hypotheses about factors contributing to students' performance and create specific action plans they can use to meet students' needs. This becomes an ongoing cycle of continuous improvement when teachers then test their hypotheses by implementing changes to their instructional practice and continue the data analysis process cycle by collecting and interpreting new student performance data to evaluate their own instructional changes and monitor the improvement of their students.

4 Self-Directed Learner's Checklist

Tasks	Target Date for Completion	Status (Not Started, In Progress, Completed)	Notes
1. I have read the *Direct Teach* content and the *Fort Bend Independent School District Case Study*.			
2. I have viewed and reflected upon the *Fairfax County Public Schools Video Exemplar*.			
3. I have completed the *Checking for Understanding Worksheet*.			
4. I have completed the *Application Worksheet*.			
5. Following the instructions for cause-and-effect analysis in the *Direct Teach*, I chose a low-achieving subject area to analyze possible causes for low achievement. Next, I developed an action plan to improve test scores in that subject area.			
6. I have developed a list of resources currently being used in my district or school to gather, analyze, and disaggregate data. I have developed goals or next steps for gathering, analyzing, and disaggregating educational data, and I have identified what resources are in place and what additional resources may be needed in my district or school.			

4 Self-Directed Learner's Checklist

Tasks	Target Date for Completion	Status (Not Started, In Progress, Completed)	Notes
7. Referring to page 11 of the *Guide to Professional Development and Training Planning: A Focus on SIS/LMS Implementations,* I have developed district-, school-, and classroom-level objectives aligned to school or state standards, and I have considered next steps for gathering, analyzing, and disaggregating data.			
8. Using the *Goals Workshop* template, I have developed district-, school-, or classroom-level objectives and possible next steps for gathering, analyzing, and disaggregating data by subgroup.			
9. I have reviewed my district's or school's vision and mission statements and determined if the curriculum standards and the data being collected are aligned with the vision and mission.			
10. Using district or school summative data from state assessments, I have identified standards students have met and those which need improvement.			
11. Using the cause-and-effect analysis information from the *Direct Teach* content, I have developed an action plan to improve scores in a low-achieving subject area.			

Self-Directed Learner's Checklist

Tasks	Target Date for Completion	Status (Not Started, In Progress, Completed)	Notes
12. I have reviewed Table 1, Data Collection and Use Plan Template, in the *Instructional Data Collection and Use Plan*. I have considered how the intended uses of data supports my district's educational goals. I have also considered potential answers to each item in the template.			
13. I have reflected upon the *Fort Bend Independent School District Case Study*.			
14. I have reflected on the resources for monitoring students' progress toward standards and considered which are effective and which may not be effective in my district or school. I have considered whether or not data from formative, benchmark, or summative assessments are part of the monitoring process and how the monitoring process is adjusted to meet RTI requirements for my district or school.			
15. I have reflected on the *Fort Bend Independent School District Case Study* again and listed objectives or next steps for making progress discussion meaningful. I have identified resources that are in place to facilitate the use of educational data and what additional resources may be needed in my district or school.			
16. I have developed district-, school-, or classroom-level objectives and next steps for gathering, analyzing, and disaggregating data to monitor students' progress toward standards using the *Goals Workshop* template.			