Data-Based Decisions

PowerPoint Slides to be used in conjunction with the Facilitator’s Guide
Recommended citation:

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Session Agenda

• Introduction
• Session Goals and Objectives
• Using Performance Data
• What to do with student performance data
• Summarize the Data
• Analyze the Data
Session Agenda, continued

• Data-based Decision Rules
• Designing a Plan- Part 1
• Designing a Plan- Part 2
• Summary
• Evaluation
Introduction

Mr. Wood has a problem.

- Emilio, a student in his class, is all over the place with his responses when asked to identify phonemes for the letters.
- Some days his data shows he can identify 23 or more.
- Other days he only identifies 10 or fewer.
- Mr. Wood is not sure what is happening with Emilio but he certainly is not consistent with his performance.
Introduction, continued

• What Mr. Wood is encountering is not an uncommon response pattern for students with significant cognitive disabilities.

• Mr. Wood thinks that the student’s performance is variable based upon his data but he has not formally drawn an aim or progress line to gauge where he expects his student to be by the data review date.
Introduction, continued

• Mr. Wood is struggling with the idea that if his data is indeed variable, what is the next step?
• What should he do with that information?
Introduction, Activity

In small groups, consider and then share with each other a time when a learner’s performance appeared to be inconsistent and uneven.

• What information or data, if any, was collected to examine the learner’s performances?
Introduction, continued

• This session is designed to teach participants to make data-based decisions about student data, including:
  – steps to identifying the pattern of a behavior,
  – the “now what?” part of data-based decisions,
  – analyzing data, and
  – applying data-based decision rules to novel data.
Introduction, continued

• Finally, participants will go further to consider how to design a plan or next steps for case study students.
Session Objectives

Upon completion of the module, participants will be able to:

• Select an accurate summary of data.
• Select the correct graph showing the progress line and aim line for a given scenario.
Session Objectives, continued

• Identify the correct decision by following decision rules for given examples.
• Select an appropriate plan for instructional or behavioral change.
Using Performance Data

• It is expected that practitioners will collect data on student performance.
• The Individuals with Disabilities Education Improvement Act of 2004 requires a statement of the student’s present level of performance and a statement about how the student will make progress toward the annual goals identified by the Individualized Education Program (IEP) team.
Using Performance Data, cont.

- The school is also required to inform parents of progress as often as students without disabilities receive that information.
- Collected data, in the form of observational notes, ratings of student performance on a data sheet, work samples, or standardized test results, etc. provide the information that can be communicated.
- What is done with those data once they are collected is the focus of this module.
What to Do with Student Performance Data

- Data can inform instructional, behavioral, and programmatic decisions for students.
- It is expected that data will be used to:
  - inform change;
  - to verify ideas or hypotheses;
  - to validate successful student performance.
What to Do with Student Performance Data, continued

• The collection and analysis of data should not only be used to serve a reporting function, but should also inform future decisions about the educational plan for a student.
What to Do with Student Performance Data, continued

- For example, what happens to the data collected on an alternate assessment for a student?
- A score is reported to the parent, school, and school district. What else happens? Does the teacher use those data to inform the IEP team of student progress and needs? Is it used to help identify instructional priorities?
What to Do with Student Performance Data, continued

• Remember Mr. Wood? He knew Emilio was not responding consistently but was unsure what to do with the data he had about Emilio’s performance.

• Data-based decisions are designed to first help teachers understand what the data actually say and then go further to support teacher decisions about what to do next.
What to Do with Student Performance Data, continued

- There are three steps to utilizing data-based decisions:
  1. measure skills,
  2. summarize progress, and
  3. determine if the progress is adequate.
  (Browder, 2001)
What to Do with Student Performance Data, continued

• The content of this module will focus on step 2 and step 3 including ideas for what to do when the progress is not adequate.

• Step 1 was explained in detail in the MAST module *Data Collection: An Introduction*. A brief review of that information is presented next.
What to Do with Student Performance Data, Activity

• Watch the slide show and accompanying audio at
  http://mast.ecu.edu/modules/dbd/lib/media/slides01/SlideShow.html.

• Consider the types of data collection systems reviewed in the slide show: task analysis, repeated trial, repeated opportunity, frequency, duration, and cumulative recording.

• Select one type that is appropriate to collect data on the learner’s inconsistent performance shared in the first introductory activity.
Summarize the Data

• Following data collection, the next step involves summarizing the progress the student is or is not making, then making decisions based upon that summary.

• Graphing is one of the easiest ways to summarize data.

• Data can be charted by the summary of responses that are independently correct (4 out of 5) or the percentage of mastery (80 out of 100).
Summarize the Data, continued

• Dates are listed in a row along the bottom of the graph or data sheet along with the number correct/percentages.

• Prior to the intervention and after approximately three points of baseline data are collected, the aim line or expected progress during the data collection period is charted. The aim line uses the baseline average as its beginning point.
Summarize the Data, continued

• If the student has no independent correct responses during the first three data points, the aim line should begin at 0.

• If the student has some independent correct responses, the first three points should be averaged together to represent an accurate starting point for baseline.
Student Name:

Objective: Given materials to complete a lab, the student will independently complete all 8 steps of the science experiment for 3 experiments.

| # | Task Description                                      | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 |
|---|-------------------------------------------------------|-----|----|----|----|----|----|----|----|----|----|----|
| 8 | Clean up                                              |     |    |    |    |    |    |    |    |    |    |    |
| 7 | Compare prd. & result                                | P   | P  | P  |    |    |    |    | P  |    | P  |    |
| 6 | Indicates results                                    | P   | P  | P  | P  | P  | P  | P  | P  | P  | P  |    |
| 5 | Observes variables                                   | P   | -  | P  | P  | P  | P  | P  | P  | P  | -  | P  |
| 4 | Conducts experiment                                  | P   | P  | P  | P  | P  | P  | P  | P  | P  | P  | +  |
| 3 | Makes prediction                                     | P   | P  | P  | P  | P  | P  | P  | P  | P  | P  | -  |
| 2 | Collects materials                                   | P   | P  | P  | -  | P  | P  | P  | P  | P  | P  |    |
| 1 | Safety attire                                         |     |    |    |    |    |    |    |    |    |    |    |

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Figure 1

← Aim Line

← Progress

← Line
Summarize the Data, continued

• In the example of Figure 1, notice the aim line begins at 4% since the student’s data for the first three points are 0, 0, and 13.

• Examine the graph closely. It includes the steps of the task analysis in the first column and includes the percentage correct in the second column. This allows the teacher to include a progress line on the graph that shows the percentage correct.
Summarize the Data, continued

• To create a line of progress, use graph paper or the data sheet to plot independent correct responses or percentages, marking each time data is taken.

• The points are then connected to show the students progress. Notice the line of progress changes when the student responds correctly in trials 3 and 8.
Summarize the Data, continued

• Let’s look at another example in Figure 2. The skill is "Given a one dollar bill, a five dollar bill, a ten dollar bill, a twenty dollar bill, and a written total (e.g., $4.50), Student will identify the correct bill to make a purchase for 4 out of 4 amounts for 3 consecutive days."

• The number of correct responses for a trial is plotted instead of the percentage correct. The aim line begins at 0 since the first three data points average to 0.
Figure 2 – (repeated)
Analyze the Data

- The teacher should review the data every 2 to 3 weeks. Since the progress line requires six points of data, a minimum of six points is required before conducting a review of the student’s progress.

- Depending upon the review timeline and the opportunity to collect data, there can be more than six. (Ten or more is a better representation of student performance over time.)
Analyze the Data, continued

• The progress line will either accelerate (i.e., increase over multiple trials), decelerate (i.e., decrease over several trials), or there will be no change.

• Depending upon the type of skill, data should accelerate or decelerate over time. A progress line that does not change indicates the student is either not responding or responding incorrectly on most if not all trials.
Data-based Decision Rules

- Five rules, outlined by Browder (2001) and Browder, Spooner & Jimenez (in press) can be used to make decisions, based on available data.

1. **Mastery.** A student who reaches the criterion set in the behavioral objective is considered to have mastered the skill.
Figure 2
Data-based Decision Rules, cont.

• Figure 2 illustrates a student who mastered the skill as the last three data points reached the mastery level (4 out of 4 correct for last three data points).

*Decision for Mastery:* When the student masters a goal, the teacher should write a new goal. This mastered goal will then become a maintenance goal.
Data-based Decision Rules, cont.

2. *Steady Progress*. When the data is above the baseline and improving (accelerating trend), but not yet at the mastery level, the student is making adequate progress.

   - The graph in Figure 3 illustrates that the student is making steady progress by increasing the number of independent accurate responses over the course of the review period.
Figure 3
Data-based Decision Rules, cont.

– While the student has not reached the mastery criterion on any occasion, the acceleration of the progress line has changed several levels during the review period and is consistent in direction (upward trend).

– The review points in the graph (the last three data points) average to be over a 50% change from the baseline points (0% baseline to 58%).

– Adequate progress is being made.
Data-based Decision Rules, cont.

*Decision for Steady Progress:* Keep teaching the same way. The student is on their way to achieving mastery and will likely by the next review of data.
Data-based Decision Rules, cont.

3. *Slow progress.* Over time data is above the baseline with a few independent correct; some small progress.

- The graph in Figure 4 illustrates that the student is making slow progress as only a few independent correct responses are being made after several weeks of instruction.
Figure 4
Data-based Decision Rules, cont.

– The trend of the progress line is moving, but not in a consistently upward direction to reach mastery.

– The review points in the graph (the last three data points) average to be under a 50% change from the baseline points (0% baseline to 41%). Slow progress is being made.
Data-based Decision Rules, cont.

Decision for Slow Progress- Keep teaching but make prompts precise and be consistent with prompt hierarchy. Use nonspecific prompting (e.g., “What do you do first?” or “What’s next?”). Don’t forget to eventually fade prompts! Provide students more time to respond without help (i.e., provide a longer delay between prompts). Only reinforce independent correct responses.
Data-based Decision Rules, cont.

4. *Variable progress.* Student performance data is up and down; the student can do responses some days but not others and there has not been an overall change in health, medications or behavior.
Figure 5
Data-based Decision Rules, cont.

– Remember the skill “Given a one dollar bill, a five dollar bill, a ten dollar bill, a twenty dollar bill, and a written total (e.g., $4.50), Student will identify the correct bill to make a purchase for 4 out of 4 amounts for 3 consecutive days.”

– Using that skill and expectation for performance, the graph in Figure 5 shows that the student can do the skill - there are four days of 3 correct and one day of 4 correct.
Data-based Decision Rules, cont.

– But intermixed between those days are performances of 0, 1, and 2 correct.

– If there are no medical or behavioral issues for the student, this performance warrants improving motivation for the student. It would be difficult to tell if the student will master this goal as there is not consistent trend in the progress line.
Data-based Decision Rules, cont.

– Note in reviewing the first three data points (average of 0) and the last three (average of 58) that the difference is the same as was found for our steady progress graph.

– However, the trend of the line is very different! There is no consistency within the trend of the line.

– Hence, the progress decision would be variable progress and require a different approach than when a student is making steady progress.
Data-based Decision Rules, cont.

*Decision for Variable Progress.* Improve motivation (reinforcers) for the student to do his/her best each time.

– Only reinforce the best performance of the student.
– Vary reinforcement and when it is given.
– Enhance natural consequences such as working with a peer, the use of other media or technology, or allowing the student to chart his/her own progress.
– Embedding choice within the task and instruction for the student may also change the student’s performance to a more consistent set of responses.
Data-based Decision Rules, cont.

5. *No progress.* Data is at or very close to 0 independent correct after instruction; there has been little to no improvement in student performance.

– There is no change in the trend of the progress line in Figure 6. There are very few independent correct responses.
Figure 6
Data-based Decision Rules, cont.

*Decision for No Progress.* The skill is too hard. Simplify the responses and/or material, break down the skill into more discrete steps, and/or include assistive technology to promote opportunities for consistent student responses.
Data-based Decision Rules, cont.

• Issues to consider before making a decision about student performance (i.e., if the data demonstrates slow progress or no progress, if the data is slow progress or steady progress):
  – First, when reviewing the data, the number of items the student is working on can significantly influence the percentage of change. In Figures 2-6, there were only four items.
Data-based Decision Rules, cont.

When the student produces even one more item correct in the last three data points (0% in baseline to 8% in last three points such as in the no progress graph, Figure 6), the change is enough to think that some progress is being made. But if you looked at the graph, the flat trend of the progress line and the length of the period for instruction support a decision of no progress.
Data-based Decision Rules, cont.

– A second issue is the goal for the student performance. A careful examination of the expectation for the student performance (e.g., is mastery set at 50%, 80%, or 100%?) is necessary to allow an accurate visual representation of the expectation through the use of the aim line.
Data-based Decision Rules, cont.

Lowering the mastery level may meet student needs and be a reasonable expectation for the student, but it may require additional instruction for the student over a longer period of time to reach an acceptable level of mastery for the skill (typically 80% or higher).
Data-based Decision Rules, cont.

– Third, there may be some instances when you would not apply data-based decisions. For example, if the student demonstrates a lack of progress that is not related to instruction such as the regression of student performance across all skills, there may be medical or behavioral interventions that are necessary before data can be collected on student academic performance.
Data-based Decision Rules, cont.

Another instance when it would be erroneous to apply data-based decisions is when data collection is inconsistent. For example, when the criteria within the data collection system is not clear to instructors, there are too few data collection sessions, or there is too long of a time period between data collection sessions.
Data-based Decision Rules, Activity

• Play the audio at http://mast.ecu.edu/modules/dbd/lib/media/audio01/SlideShow.html of Dr. Shawnee Wakeman discussing these issues further.
Designing a Plan- Part 1

• Applying data-based decisions requires graphing and summarizing the data, applying the decisions rules, and designing a plan for the next instructional sequence.

• The teacher can better plan instruction when he or she understands what the data represents for student performance and carefully considers the student’s needs and preferences.
Designing a Plan- Part 1, cont.

• Based upon the recommendations within the decision rules, the plan should be tailored to the individual student.

• The plan should have enough detail that it can be implemented with fidelity during the next benchmark review period of data collection and instruction.
Designing a Plan- Part 1, cont.

• There are three types of problems that correspond to the decision about student performance.
  – The first is when no progress (i.e., no independent correct responses) is being made by the student. The recommendation is to simplify the skill.
The second problem is when the student is making progress, but too slowly. The recommendations are to plan ways to fade prompts, teach the skill more times each day, and use peer modeling.

The final problem is when the student is showing regression or variable performance. The recommendation, if the performance is not related to a medical or behavioral issue, is to enhance natural consequence and use reinforcers.
Designing a Plan- Part 1, cont.

• There are several ways to address changes needed once a decision has been reached. For example, to simplify a response, the teacher can use:
  • chaining (i.e., instruction of only one part or piece of the task analysis);
  • break the task analysis down into more discrete or smaller steps;
  • more distinct response choices to make the discrimination easier;
  • scaffolds such as a jig or checklist.
Designing a Plan- Part 1, cont.

• By selecting one or more of these recommendations, the teacher can then refine the plan with specific information that is unique to the student’s needs and abilities (Browder, 2001).
Designing a Plan- Part 1, Activity

• Play the PowerPoint at http://mast.ecu.edu/modules/dbd/lib/media/slides02/SlideShow.htm that provides more information about designing a plan for individual students that have one of these three types of progress and problems.
Designing a Plan- Part 2

• The PowerPoint presentation provided details about ideas for change within an instructional plan when a student is making no progress, slow progress, or variable progress.

• While these ideas to facilitate change are general and can be applied to different situations, the examples provide more detail about the types of situations that may occur.
For example, if a student is unable to respond in the manner in which the task is designed, they will not be able to make progress. Therefore the task must be simplified by either the use of assistive technology and/or a change in the expectation of how the student is to respond within the task (e.g., use of an eye gaze instead of a verbal response).
Designing a Plan- Part 2, cont.

• Designing a plan may require the teacher to further analyze the student performance data.

• For example, when a student is performing at a variable rate, what is occurring on days when the student is performing at his best that may not be occurring on other days?

• This level of analysis can help guide the plan for change.
Designing a Plan- Part 2, Activity

• Divide into three groups. Each is assigned one of the conditions of learners: those making no progress, slow progress or variable progress.

• Develop a basic description of a learner experiencing that condition and suggest, consistent with the PowerPoint slide presentation, strategies appropriate to that condition and learner’s characteristics.
Summary

• Data-based decisions are based upon four steps:
  – summarize the data,
  – analyze the data,
  – apply the decision rules, and
  – design a plan.

• Establishing an aim line for expected progress and then charting the actual progress of the student are necessary before a decision about the data can be made.
Summary, continued

• There are five options for a decision:
  – mastery,
  – steady or adequate progress,
  – slow progress,
  – variable progress, and
  – no progress.

• As a result of the decision made about student progress based upon the data, practitioners can design a plan of change when necessary.
Session Evaluation

A form for participants to evaluate the session is available in the Facilitator’s Guide.
Focus and Reflection Questions

Address any questions remaining unanswered during this session?
Application & Extension activities

1. Data-based Decision Case Study Activity - Lydia

Using information from the student case study and data sheet, plan how to address student performance issues for student instruction in the next two benchmark weeks.
Application & Extension activities, Lydia continued

• Lydia is an 8-year-old 3rd grade student with autism and moderate cognitive disabilities. Lydia is non-verbal and uses a variety of assistive technology to communicate expressively and receptively. She recognizes the letter L only and uses a picture and photograph communication system with only three tasks on it at a time for her daily schedule. Lydia can identify the number 1 and 3 out of 10. She does not enjoy reading books but will participate if the book matches her interest. She does enjoy videos of the Disney princesses with Ariel being her favorite.
Application & Extension activities, Lydia continued

- She likes the adapted Junie B. Jones books in particular. Lydia participates in art with her general education peers and an assistant and eats lunch at the same time as the other 3rd graders, but she sits with her self contained class and sometimes some peer buddies. She can match some picture representations of objects to the objects, can follow familiar two and three step directions without prompts when given in a picture or photograph sequence, can orient and turn the pages of a book without prompts, and can trace her name. She loves to earn a smiley face to take home each day.
## Data for Lydia

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**Teacher's Notes:**

- Picture of apple.
- Apple and sock.
- Apple or Sock?
- Produces storyline.
- Attends to text.
- Touches apple.
- Selects a book.
- Are you ready?
Nick is a 12-year-old, 7th grade, student with visual, motor, and moderate cognitive disabilities. Nick uses a power wheelchair for mobility and a variety of assistive technology to access information and produce work. He recognizes initial letter sounds associated with familiar names and words that represent activities in his daily schedule (i.e., “N” for Nick, “L” for lunch). Nick can count up to 5 objects with 1:1 correspondence.
Data-based Decision Case Study Activity- Nick, continued

• He has a sight vocabulary of 15 words, related to daily activities and names of family members, but has a very large picture vocabulary. Nick participates in general education content classes with adult and peer support (i.e., program assistive writing software with key vocabulary and picture symbols, manage materials for lessons, personal hygiene assistance). He can match picture representations of objects that relate to key concepts in each core content area (i.e., picture of a tree paired with a block of wood to represent concept of “natural resource” in science unit).
### Repeated Trial

**Student:** Nick

**Academic Component:** ☑ Mathematics  ☐ Reading  ☐ Writing

**Task:** Given manipulatives and a set of written number symbols, Nick will count 6-10 objects with 80% accuracy for 3 consecutive days.

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**Number Performed Correctly Independently**

| 0 | 2 | 0 | 3 | 1 | 2 | 1 | 0 | 2 | 4 |

**Where:**

**With Whom:**
Self-Assessment

- A self-assessment with response feedback is available at [http://mast.ecu.edu/modules/dbd/quiz/](http://mast.ecu.edu/modules/dbd/quiz/). Participants may take this assessment online to evaluate their learning about content presented in this module.