



Universiteit
Leiden
The Netherlands

Data Teams in Teacher Preparation: Improving Data-Based Instruction in Reading

Toste, J.R.; Filderman, M.J.; Espin, C.A.

Citation

Toste, J. R., Filderman, M. J., & Espin, C. A. (2022). Data Teams in Teacher Preparation: Improving Data-Based Instruction in Reading. *Intervention In School And Clinic*.
doi:10.1177/10534512221130073

Version: Publisher's Version

License: [Licensed under Article 25fa Copyright Act/Law \(Amendment Taverne\)](#)

Downloaded from: <https://hdl.handle.net/1887/3564960>

Note: To cite this publication please use the final published version (if applicable).

Data Teams in Teacher Preparation: Improving Data-Based Instruction in Reading

Jessica R. Toste, PhD^{1,2} , Marissa J. Filderman, PhD³,
and Christine A. Espin, PhD⁴

Abstract

Data-based instruction (DBI) is a process of collecting and using student progress data to guide decision-making related to intervention intensity and individualization for students with learning disabilities (LD). However, effective DBI requires that teachers have a range of knowledge and skills across multiple domains. Past research has shown that data teams can improve teachers' use of data for instructional decision-making. This article describes the use of simulated data teams to build capacity for DBI among pre-service teachers in an undergraduate-level course focused on intensive reading intervention. Three components are described for each weekly data team meeting: (a) mini professional development session (e.g., instruction led by course instructor focused on key DBI knowledge and skills), (b) data chat (e.g., review and discussion of student data), and (c) completion of a weekly team activity and submission. The structure and implementation of this 5-week, multi-component professional learning tool are detailed.

Keywords

data-based instruction, curriculum-based measurement, reading intervention, teacher preparation

Students with learning disabilities (LD) often experience persistent, intractable challenges with reading and need powerful, targeted interventions to support their ongoing skill development. Teachers who use student progress monitoring data to inform their instructional decision-making effect greater achievement for students with LD in reading than teachers who do not (Fuchs et al., 2021). However, effective data-based instruction (DBI) requires that teachers have the requisite knowledge and skills needed to estimate students' response to intervention and determine when adjustments are needed. Past research has shown that data teams, school-based teams centered around data use practices and collaborative analysis of data for decision-making, can improve teachers' capacity for data-based instructional decisions (Schildkamp & Poortman, 2015). Yet there is still little known about how to effectively train and prepare teachers to participate in data teams.

This article describes the potential for simulated data teams within special education teacher preparation programs to build capacity for special education teachers' interpretation and use of individual student-level data to

intensify reading interventions. The data team assignment provides a framework for pre-service teachers to receive additional targeted training on DBI, review progress data from both real and hypothetical student data, as well as collaborate on activities wherein they can apply their DBI knowledge and skills. Through the multi-component structure of the data teams, course instructors facilitate collaborative experiences, check for understanding, and assess student learning overtime. While no empirical studies have investigated the efficacy of the particular structure described in this article, the data teams approach, as well as the instructional and assessment practices, align with principles

¹The University of Texas at Austin, Austin, TX, USA

²The Meadows Center for Preventing Educational Risk, Austin, TX, USA

³University of Alabama, Tuscaloosa, AL, USA

⁴Leiden University, Leiden, The Netherlands

Corresponding Author:

Jessica R. Toste, Department of Special Education, The University of Texas at Austin, 1 University Station, D5300, Austin, TX 78712, USA.
Email: jrtoste@austin.utexas.edu

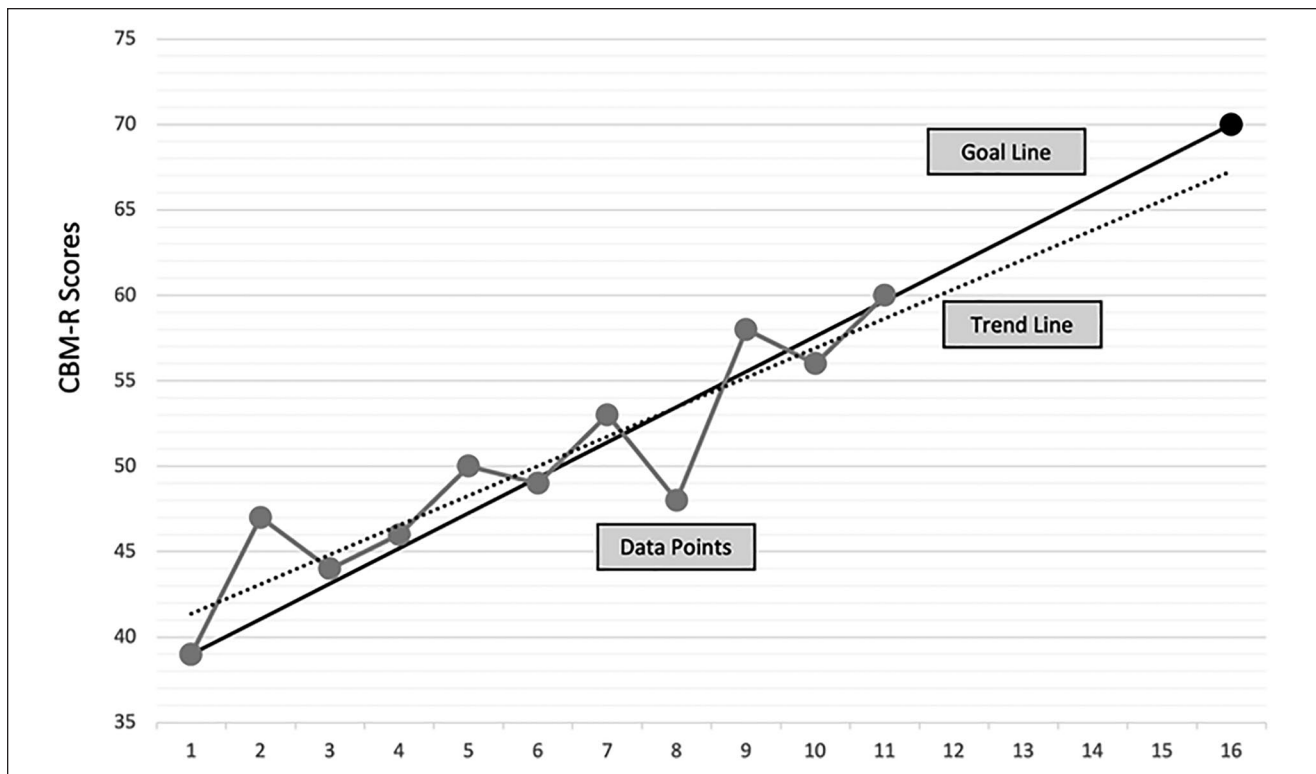


Figure 1. Sample CBM progress graph.

Note. Graph presents 11 weeks of data; baseline score of 39 words correct per minute (wcpm); and individualized goal of 70 wcpm by end of 16-week intervention period. CBM-R = curriculum-based measurement in reading.

of effective college teaching and teacher professional development. In this article, instructors are provided with guidelines, examples, and recommendations for successful implementation of data teams in an undergraduate-level course focused on intensive intervention for students with LD in reading.

Teachers' Data-Based Instruction

Student data are collected and used by schools for multiple purposes. For example, teachers often discuss *universal screening* wherein academic data are used to make decisions related to instructional grouping, benchmarking, or risk monitoring over the course of a year (Fry et al., 2022). For students with LD in reading who are receiving intervention, data are used for progress monitoring or tracking responsiveness to the instructional program. Progress data are collected more frequently and are interpreted over time rather than a one-time data point. Also referred to as data-based individualization or data-based program modification, DBI (Deno, 1985; National Center on Intensive Intervention, 2013), is a process of collecting and using progress data to guide decision-making related to intervention intensity and individualization. Research has demonstrated that DBI results in significant improvements in the

academic performance of students with LD (Filderman et al., 2018; Jung et al., 2018) with larger effects associated with greater use of data (Fuchs et al., 2021).

Data-based instruction most frequently relies on curriculum-based measurement (CBM; Deno, 1985), a system of ongoing, frequent progress monitoring. CBM scores are placed on a graph to guide teachers' decision-making (see Figure 1). Key features of the graph include (a) the y-axis, or the scale for the measurement being used; (b) the x-axis, which represents each assessment administrations; (c) the collected data points; (d) the long-range goal line, which is the expected rate of growth; and (e) the slope or trend line, which is the student's actual rate of growth. To use the graph to make instructional decisions, teachers compare the student's actual rate of growth to the expected rate of growth. If the actual rate of growth is lower than expected, it is an indication that instruction should be adjusted to better align with the student's learning needs. For additional description of the DBI process in reading, see Filderman and Toste (2018).

A key assumption of DBI is that teachers can effectively use student data to guide decision-making; however, this is no small feat. There are complex decision-making processes involved in interpreting graphs and responding to the data with appropriate instructional adjustments (Toste &

Espin, 2022), and teachers require a range of knowledge and skills across multiple domains to do this effectively and efficiently. As such, there is a need to ensure that pre-service teachers are adequately trained in using student progress data for DBI. Such learning opportunities will help build expertise so that novice teachers are able to effectively intensify and individualize interventions to meet the needs of students with LD.

Collaboration and Data Use

Research on teachers' professional learning provides evidence that collaboration can optimize data use opportunities (Darling-Hammond et al., 2017; Hochberg & Desimone, 2010; Wayman et al., 2006). Collaboration is particularly important for teachers' data literacy (Jimerson & Wayman, 2012) and their ongoing use of data (Means et al., 2011; Piro et al., 2014). In a recent meta-analysis, Filderman et al. (2021) reported that training improved teachers' data literacy, and further, training with a collaborative component was associated with larger effects on knowledge and skills. These findings were consistent with prior research observing that teachers in small groups interpret data more accurately, clarify problems, ask follow-up questions, problem-solve, and correct errors (Means et al., 2011). Moreover, teachers' use of data for instructional decision-making has been shown to be enhanced through opportunities to talk about data, interpret and understand data, and reflect upon instructional alignment (Diamond & Cooper, 2007; Marsh, 2012; Wayman & Stringfield, 2006).

Despite these findings, the successful use of data teams has been limited in practice (Schildkamp & Datnow, 2022; Schildkamp & Poortman, 2015). As such, there is a need for special education teachers to receive training on the decision-making aspects of progress monitoring and successful implementation of school-based data teams. This article describes the potential for providing such training within the context of special education teacher preparation program via the use of simulated data teams.

Data Teams in Action

There has been ongoing interest in better preparing pre-service teachers for data use (Mandinach & Gummer, 2013) as reviews of coursework in U.S. teacher preparation programs suggest minimal focus on data interpretation and decision-making (Greenberg & Walsh, 2012). Their potential for gaining experience is further limited by the fact that many schools do not have regular, structured data team meetings and, for those that do, data teams often do not engage in discussions focused on using data to make instructional decisions (Silva et al., 2021). Thus, as an assignment framework, data teams allow a course instructor to (a) deliver targeted training on knowledge and skills

related to effective DBI, and (b) facilitate simulation of the data team experience for pre-service teachers. This training prepares future teachers to meet the instructional needs of students with LD who experience severe, persistent difficulties in reading.

Rather than a one-off or stand-alone assignment, data teams are ongoing and multi-component. Data teams offer a framework wherein students have multiple opportunities to engage in professional learning, collaborative data use, and applied activities related to DBI. In this way, the framework for this assignment creates a structured opportunity for pre-service teachers to participate in a data team. The experience is intended to increase proficiency in interpreting and using student data with the goal of intensifying reading interventions.

Data Team Assignment Overview

The purpose and structure of a data team will need to be explicitly introduced to pre-service teachers. Broadly speaking, a data team is a group of teachers or other school professionals who meet to discuss student data, and this team works collaboratively to build knowledge and skills related to use, interpretation, and analysis of data through ongoing professional development. Teams meet regularly (e.g., weekly, biweekly, monthly) to review students' progress data. In schools, teams may use data for various purposes (e.g., instructional grouping, screening); however, the current data team assignment focuses on collection and interpretation of individual student-level progress data to monitor intervention responsiveness and make decisions related to the intensification of reading interventions.

Data team meetings take place during class time over 5 weeks or more. Pre-service teachers are assigned to a team with whom they work for the duration. Each weekly data team meeting is approximately 1 hr and includes three components: mini professional development session (e.g., instruction led by course instructor focused on key DBI knowledge and skills), data chat (e.g., review and discussion of student data), and completion of a weekly team activity and submission. At the end of the semester, pre-service teachers submit individual final reports.

Planning for Implementation

The course instructor should plan for several aspects of the data team implementation: (a) how teams will be created; (b) availability of student data; and (c) structure of weekly data team meetings. The sections that follow offer suggestions to guide this planning.

Creating teams. Before getting started, the course instructor will need to create teams. Teams of 4–5 students are ideal, though this can be changed based on the size of the class.

Pre-service teachers are often completing school-based practicums alongside their coursework, and these should be considered when assigning teams. It can be helpful to have pre-service teachers complete a team creation survey to help inform this process. The survey can ask for practicum details such as grade level(s), placement type (e.g., resource, inclusion support), whether data are collected by the cooperating teacher (CT), type of data being collected, and frequency of the data being collected. Course instructors might consider the following when creating the data teams:

- What should team members have in common? It is generally useful to group team members based on the grade levels they are teaching (e.g., elementary, secondary), but there may be other features that the course instructor deems to be important.
- What are the teaching responsibilities of the team members? Depending on the type of practicum that pre-service teachers are completing, they may be in a wide range of placements. For example, some pre-service teachers may be in a placement where little to no reading intervention is taking place. Every data team should include some members who are providing ongoing reading intervention.
- To what degree do pre-service teachers have access to student data? Course instructors will want to ensure that every data team is able to work with student progress data (e.g., CBM data collected frequently, ongoing). This issue is further discussed in the following section.

Once teams have been created, it can be helpful for each to have a dedicated folder to organize all materials (e.g., student data) and to place weekly handouts provided by the course instructor for the data team meeting. Teams might be encouraged to choose a team name and a team captain, who will be responsible for collecting materials at the start of the class meeting and uploading the team's completed weekly submissions. Alternatively, based on preferences of the course instructor and team members, the team captain role may be assigned on a rotating basis.

Collecting student data. Next, the course instructor will need to plan for each data team to have access to student progress data. There are two different approaches an instructor might take when planning for this aspect of the data team meetings, both assume that pre-service teachers are completing school-based practicums or currently working in school settings alongside the course.

The first approach is to have pre-service teachers take responsibility for communicating with their CTs to access data being collected for the students with whom they are working. Student data with all identifying information removed can be shared for educational purposes, such as

review and analysis by trainees within the context of a course in their teacher preparation program. One challenge with this approach, which may come as a surprise to both course instructors and pre-service teachers, is that not all CTs are collecting student data. On the team creation survey, course instructors can ask about availability of student data to ensure that at least one member of each team is able to bring data to class for review.

The second approach is to introduce an additional component to the assignment by having pre-service teachers collect their own data for a target student in their practicum. They should be supported in selecting a target student with persistent reading challenges who is receiving intervention, in planning for weekly data collection, and in collecting data over an established period. Because DBI requires interpretation of data over time (i.e., rather than a single time point), pre-service teachers should begin collecting data with target students at the beginning of the semester before the data teams begin. The challenge with this approach is the additional demand it places on pre-service teachers; they will need to negotiate time for data collection in their practicum and must be prepared with the skills to administer and score data.

Course instructors will need to weigh the benefits and drawbacks of either approach. Ultimately, the approach taken to support pre-service teachers in accessing student progress data will depend on several contextual factors (e.g., other requirements placed on pre-service teachers for implementation activities in practicum, personal preferences, prior CBM training).

Weekly meeting structure. Each week, there should be a central topic that is the focus of data team activities. Table 1 provides a sample schedule of weekly meeting topics and guiding questions. Each weekly data team meeting includes three components: (a) mini professional development (PD) session, (b) data chat, and (c) completion of a weekly team activity and submission.

Mini professional development session. The course instructor begins the data team meeting time by facilitating a brief, targeted PD session. The content of each session should directly address the week's topic and guiding questions (see Table 1). There is an assumption that pre-service teachers have some requisite knowledge about CBM and DBI before data teams begin. As such, these mini PD sessions provide an opportunity to enhance or deepen DBI knowledge and skills related to the weekly topic to support application within the context of the data team meeting. They might take the form of a presentation or lecture delivered by the course instructor or through facilitated engagement with videos or online resources. For example, the interactive DBI modules developed by the National Center for Intensive Intervention (www.intensiveintervention.org) or the YouTube video repository developed by the Project EXPERT team (<http://>

Table 1. Schedule of Weekly Data Team Meeting Topics.

Week	Meeting topic	Guiding questions
1	Setting the Stage	<ul style="list-style-type: none"> • What type of data do I use for decision-making? • How do I assess students' strengths and areas of need?
2	Selecting a Tool & Setting a Goal	<ul style="list-style-type: none"> • What type of CBM progress data should I collect? • Why do we set goals? • What makes a "good" goal? • How do I determine a student's goal?
3	Monitoring Progress	<ul style="list-style-type: none"> • What is the purpose of progress monitoring? • Why should I put data on a graph?
4	Analyzing & Interpreting Data	<ul style="list-style-type: none"> • What are key features of the graph? • What type of decisions can I make with a graph? • How do I interpret CBM progress graphs?
5	Adjusting Instruction	<ul style="list-style-type: none"> • When and why would I adjust my instruction? • How can I adjust my instruction based on data gathered from diagnostic and CBM data? • How do I know which adjustments are appropriate?

Note. CBM = curriculum-based measurement.

tinyurl.com/EXPERTModules). Course instructors might also consider administering a pre-assessment focused on content from earlier in the semester and/or other courses. The results of this assessment can help determine whether there is a need to address gaps in pre-service teachers' knowledge prior to implementation of data teams.

Data chat. Next, each team works together to review, discuss, and interpret student data that was collected for the students with whom they work in school settings. This *data chat* component is guided by a set of structured questions related to the weekly topic. The purpose of the data chat is to support collaborative data use practices; therefore, questions should guide pre-service teachers in applying the knowledge and skills targeted in that week's mini PD session. For example, for the data team meeting focused on "Selecting a Tool & Setting a Goal" (Week 2), the guiding questions might include: *What type of CBM might be used to monitor progress for this student (and what information did you use to make this decision)? What additional information would you need in order to set a goal for this student?*

Course instructors will likely need to modify data chat questions based on the composition of teams and the type of data available to them. For example, it is not uncommon for most pre-service teachers in a course to report that their CTs are collecting ongoing student progress data, only to later realize that data are being collected infrequently (e.g., at the end of reporting period), are not the most useful data for DBI (e.g., benchmark assessment), or are aligned with grade-level benchmarks rather than individualized outcome goals. Questions can be modified so that data chats are still able to serve the purpose of engaging in data use practices.

Weekly activity and submission. Finally, teams work together to complete their weekly data team activity and

submission. Depending on the purpose of the activity that week, the activity may involve the use of real student data, the use of hypothetical data provided by the course instructor, or it may not require data. For example, for the data team meeting focused on "Setting the Stage" (Week 1), the weekly activity might involve completion of a data literacy knowledge assessment, such as the progress monitoring questions from the Teacher Knowledge Survey developed by Spear-Swerling and Cheesman (2012). Pre-service teachers discuss the questions as a team and develop a rationale for their responses. Table 2 outlines several sample activities that could be used for the purpose of weekly data team submissions.

Assessment of Student Learning

The weighting of data team components should be determined based on learning objectives and assessments in individual courses. In past data team implementation, the overall assignment has been worth 20% of the final course grade, which included cumulative points from two different assessments: (a) weekly group submission and (b) individual final report.

Weekly group submission. As previously noted, at the end of each week's data team meeting, pre-service teachers complete a team submission. These weekly submissions are most easily managed through the course learning management system (e.g., Canvas), and they will likely vary in format across weeks (e.g., written response, upload photos of completed worksheet). The course instructor should modify these team submissions based on the course content, types of available student data, pre-service teachers' learning needs, and personal goals. Instructors may choose to grade weekly submissions based on completion, wherein full

Table 2. Descriptions of Weekly Data Team Activities.

Topic	Sample activity
Selecting a Tool	<p>Explore the National Center for Intensive Intervention’s progress monitoring tool chart at https://charts.intensiveintervention.org/aprogressmonitoring</p> <p>Respond to each of the following questions:</p> <ol style="list-style-type: none"> 1. Visit the tool chart page and describe the legend. What type of information is available in the chart? 2. Select your content (reading) and grade level (your choice) to find appropriate tools. Choose one tool that appears to be evidence-based and briefly describe the evidence to support it. 3. Select one tool that has unconvincing evidence. Describe the difference(s) between a tool that is considered evidence-based and this one.
Setting a Goal	<p>Discuss this scenario with your team and submit a written response:</p> <p>Julian is a third-grade student whom you are working with in intervention. He is at a second-grade instructional level and you are planning to collect 10 weeks of progress monitoring data, using normed levels of growth. His median baseline oral reading fluency (ORF) score was 32. Set an “ambitious” outcome goal for Julian. Explain how you calculated this goal.</p>
Selecting a Tool & Setting a Goal	<p>Review the hypothetical case and work with your team to calculate a goal for Marcel based on the information provided. Upload a photo of your team’s completed worksheet.</p> <p>Respond to each of the following questions.</p> <p>Select Tool:</p> <ul style="list-style-type: none"> • Marcel is a third-grade student new to Marsha P. Johnson Elementary School. His teacher, Ms. Brooks, believes Marcel needs intervention support and wants to determine his current instructional level. What would she do first? • Ms. Brooks administered a nonsense-word fluency probe and a word identification probe. She discovered that Marcel was at a second-grade level for word identification, but a beginning of the year first-grade level for nonsense-word fluency. What skills might this indicate that Marcel is specifically struggling with? • What CBM would be most appropriate to track Marcel’s progress? <p>Determine Frequency:</p> <ul style="list-style-type: none"> • Considering Marcel’s instructional level, how many weeks might Ms. Brooks want to track his data to monitor progress? Why? • What if Marcel were reading at a third-grade level? What would Ms. Brooks need to consider to decide on frequency of data collection? <p>Set Marcel’s Goal:</p> <ul style="list-style-type: none"> • Ms. Brooks decided to track Marcel’s progress on oral reading fluency (ORF). Help her set a “realistic” goal for Marcel using the normed levels of growth, 10 weeks of instruction, and a median baseline score of 15.
Analyzing & Interpreting Data	<p>Use the applied graph analysis worksheet to analyze Harrison’s graphed data. Upload a photo of your team’s completed worksheet. [Worksheet includes graph with plotted data points.]</p> <p>On the graph provided, do the following:</p> <ol style="list-style-type: none"> 1. Plot Harrison’s individual outcome goal (59 wcpm) 2. Draw the goal line (solid line) 3. Draw a trend line through the data (dotted or colored line) 4. Circle the last three data points <p>Next, use the completed graph to answer the following questions:</p> <ol style="list-style-type: none"> 1. Using the slope method and the points below method, what do you conclude? 2. Which method would you use for Harrison’s data? Why? 3. What happened during Session 7? What would happen if you decided that Harrison was not making progress after this session? [This data point was an outlier, or an extremely low data point, that could sway decision-making.]

Note. CBM = curriculum-based measurement.

Table 3. Checklist for Data Team Individual Final Report.

Rationale and importance of data teams

- Why is data-based instruction important for students with learning disabilities in reading?
- What is a data team? How does it support data use?
- Why should our school have a data team?

Professional development

- What training will teachers require in order to be effective team members?
- What resources are available to support data teams (e.g., readings, online, trainings)?

Personnel involvement

- Who will need to be a part of the team?
- What is the rationale for each team member?

Implementation plans

- What will team members be responsible for during each meeting?
- What student data will need to be collected to inform instructional decision-making?
- Provide a sample agenda for the school's first data team meeting.

points are awarded if the team submission is uploaded, or performance, wherein the instructor assigns points based on their evaluation of the work. Either way, it is recommended that each weekly submission is weighted the same (e.g., 10 points per week) and the same grade is assigned to all team members.

Individual final report. At the end of the semester, upon conclusion of the data team experience, it is helpful for pre-service teachers to complete an individual final report. The purpose of this report is to translate their learning about data teams into school-based application. This work may be framed as follows: *Imagine you would like to begin a data team at your school, and you were asked to prepare a proposal for your administrator.* The report may include sections related to rationale and importance of data teams, professional development needs, personnel needed for a successful data team, and implementation plans. Pre-service teachers should write as an expert, making the case for a data team in their school, and integrating content from the reading methods course (e.g., research articles, resources). Table 3 presents a sample checklist to guide completion of each section of the data team report.

In a final section of the report, pre-service teachers might be asked to provide an overall reflection on their data team experience throughout the semester. Reflection questions could include:

- What did you learn this semester that helped you understand the value of data teams (or not)?
- Is there a success story you can share about using data or analyzing a specific student's data?
- Was there a problem that got solved collaboratively (e.g., issue that you or a colleague struggled with but were able to understand at a team meeting)?
- How will you use data in your classroom next year? What will be your DBI goals?

Finally, pre-service teachers should also be provided with clear evaluation criteria for this final report. Course instructors might consider using a grading rubric to present performance expectations for each section of the report. A rubric presents key criteria or component parts of an assignment along with clear descriptions of the characteristics of the work at varying levels of mastery. The Eberly Center at Carnegie Mellon University has developed freely available resources (<http://www.cmu.edu/teaching/designteach/teach/rubrics.html>).

Planning a Successful Data Team Experience

When planning for future implementation of simulated data teams, there are specific decisions that need to be made to ensure that the data team experience is successful for all. There is no single, correct answer to any of these questions as they are dependent on the context of individual teacher preparation program, courses, schools, instructors, and pre-service teachers. Instructors planning for data teams may consider the following questions:

- How many weeks will you implement data teams in your course?
- What is the central topic you will focus on each week?
- What factors need to be considered in creating the data teams?
- How will pre-service teachers access student progress data?
- What data activity and submission will be completed by the teams each week?
- Will you include an individual final report to be submitted at the end of the semester?

Teachers require support in building capacity to use data. Data teams provide an ongoing professional learning and collaboration, which can increase appreciation for the

nuances of data-based decisions, understanding of the uses of different data sources, and commitment to collect ongoing progress data to inform instructional decision-making. For pre-service teachers, participation in data teams provides support to critically reflect upon data use practices and their own professional learning about DBI. If special education teachers are expected to effectively implement DBI to intensify and individualize intervention supports for students with LD in reading, there must be early investments made in their development of data literacy knowledge and skills. Fostering teachers' decision-making expertise can, and should, begin in teacher preparation programs.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was supported by the U.S. Department of Education, Institute of Education Sciences, grant number R324A190126. Nothing in this article necessarily reflects the positions or policies of the agency and no endorsement by it should be inferred.

ORCID iD

Jessica R. Toste  <https://orcid.org/0000-0002-6327-0054>

References

- Darling-Hammond, L., Burns, D., Campbell, C., Goodwin, A. L., Hammerness, K., Low, E. L., . . . Zeichner, K. (2017). *Empowered educators: How high-performing systems shape teaching quality around the world*. John Wiley.
- Deno, S. L. (1985). Curriculum-based measurement: The emerging alternative. *Exceptional Children, 52*(3), 219–232.
- Diamond, J. B., & Cooper, K. (2007). The uses of testing data in urban elementary schools: Some lessons from Chicago. *Teachers College Record, 109*(13), 241–263.
- Filderman, M. J., & Toste, J. R. (2018). Decisions, decisions, decisions: Using data to make instructional decisions for struggling readers. *TEACHING Exceptional Children, 50*(3), 130–140.
- Filderman, M. J., Toste, J. R., Didion, L. A., & Peng, P. (2021). Data literacy training for K–12 teachers: A meta-analysis of the effects on teacher outcomes. *Remedial and Special Education, 43*, 328–343.
- Filderman, M. J., Toste, J. R., Didion, L. A., Peng, P., & Clemens, N. H. (2018). Data-based decision making in reading interventions: A synthesis and meta-analysis of the effects for struggling readers. *The Journal of Special Education, 52*(3), 174–187.
- Fry, E., Furjanic, D. J., & Toste, J. R. (2022). *Special and general education teachers' understanding of data-based decision-making to improve instruction for students with reading disabilities*. [Manuscript in final preparation]. Department of Special Education, The University of Texas at Austin.
- Fuchs, L. S., Fuchs, D., Hamlett, C. L., & Stecker, P. (2021). Bringing data-based individualization to scale: A call for the next-generation of teacher supports. *Journal of Learning Disabilities, 54*, 319–333.
- Greenberg, J., & Walsh, K. (2012). *What teacher preparation programs teach about K-12 assessment: A review*. National Council on Teacher Quality.
- Hochberg, E. D., & Desimone, L. M. (2010). Professional development in the accountability context: Building capacity to achieve standards. *Educational Psychologist, 45*(2), 89–106.
- Jimerson, J. B., & Wayman, J. C. (2012, April). *Branding educational data use through professional learning: Findings from a study in three school districts*. Paper presented at the Annual Meeting of the American Educational Research Association, Vancouver, British Columbia, Canada.
- Jung, P.-G., McMaster, K. L., Kunkel, A. K., Shin, J., & Stecker, P. M. (2018). Effects of data-based individualization for students with intensive learning needs: A meta-analysis. *Learning Disabilities Research & Practice, 33*(3), 144–155.
- Mandinach, E. B., & Gummer, E. S. (2013). A systematic view of implementing data literacy in educator preparation. *Educational Researcher, 42*(1), 30–37.
- Marsh, J. A. (2012). Interventions promoting educators' use of data: Research insights and gaps. *Teachers College Record, 114*(11), 1–48.
- Means, B., Chen, E., DeBarger, A., & Padilla, C. (2011). *Teachers' ability to use data to inform instruction: Challenges and supports*. U.S. Department of Education.
- National Center on Intensive Intervention. (2013). *Data-based individualization: A framework for intensive intervention*. Office of Special Education Programs, U.S. Department of Education.
- Piro, J. S., Dunlap, K., & Shutt, T. (2014). A collaborative data chat: Teaching summative assessment data use in pre-service teacher education. *Cogent Education, 1*(1), 968409.
- Schildkamp, K., & Datnow, A. (2022). When data teams struggle: Learning from less successful data use efforts. *Leadership and Policy in Schools, 21*(2), 147–166.
- Schildkamp, K., & Poortman, C. (2015). Factors influencing the functioning of data teams. *Teachers College Record, 117*(4), 1–42.
- Silva, M. R., Collier-Meek, M. A., Codding, R. S., Kleinert, W. L., & Feinberg, A. (2021). Data collection and analysis in Response-to-Intervention: A survey of school psychologists. *Contemporary School Psychology, 25*, 554–571.
- Spear-Swerling, L., & Cheesman, E. (2012). Teachers' knowledge base for implementing response-to-intervention models in reading. *Reading and Writing, 25*(7), 1691–1723.
- Toste, J. R., & Espin, C. (2022). *Application of decision science to teachers' data-based decision-making: Improving effectiveness of intensive reading interventions*. [Manuscript submitted for publication]. Department of Special Education, The University of Texas at Austin.
- Wayman, J. C., Midgley, S., & Stringfield, S. (2006, April). *Leadership for data-based decision-making: Collaborative educator teams*. Paper presented at the 2006 Annual Meeting of the American Educational Research Association, San Francisco, CA, United States.
- Wayman, J. C., & Stringfield, S. (2006). Technology-supported involvement of entire faculties in examination of student data for instructional improvement. *American Journal of Education, 112*(4), 549–571.