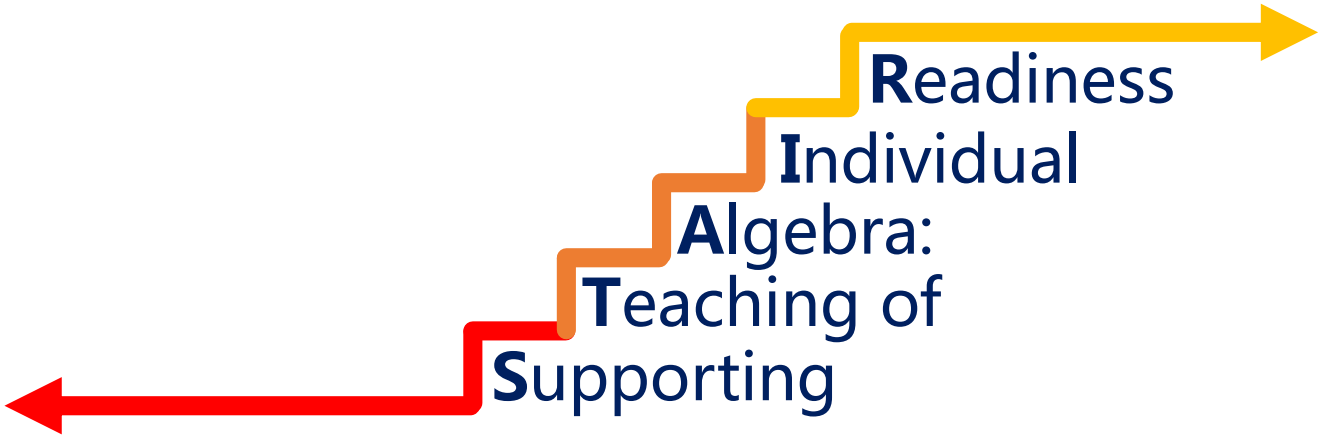
Data-based Individualization to Support Positive Outcomes for Middle-School Students and Teachers

Leanne Ketterlin-Geller, Southern Methodist University
Sarah Powell, University of Texas, Austin
and Erica Lembke, University of Missouri



IDEAs that Work

Office of Special Education Programs
U.S. Department of Education

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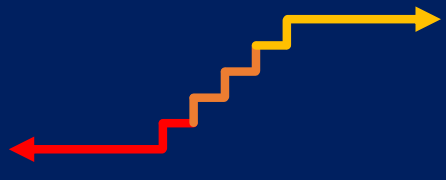
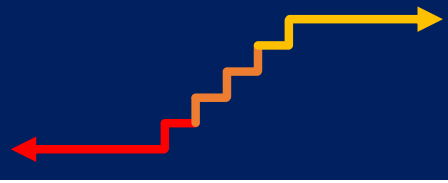


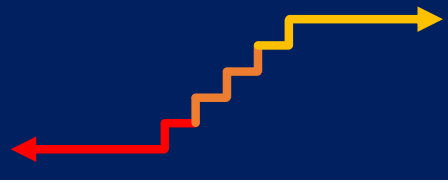
Agenda for the Presentation

- Discuss the need for intensive intervention for students with disabilities
- Define data-based individualization
- Describe the Project STAIR intervention
- Summarize the results of the pilot implementation
- Discuss Implications and future directions



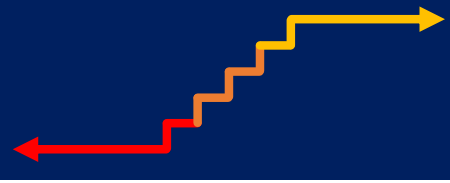
Struggling Mathematicians

- 2019 Grade 8 Mathematics NAEP data (NCES, 2019):
  - 9% of SWDs scored at or above proficient
  - 37% of students without disabilities scored at or above proficient
- 2015 Grade 12 Mathematics NAEP data (NCES, 2015):
  - 3% of SWDs scored at or above proficient
  - 25% of students without disabilities scored at or above proficient
- SWDs also fail to graduate at twice the rate of their peers and

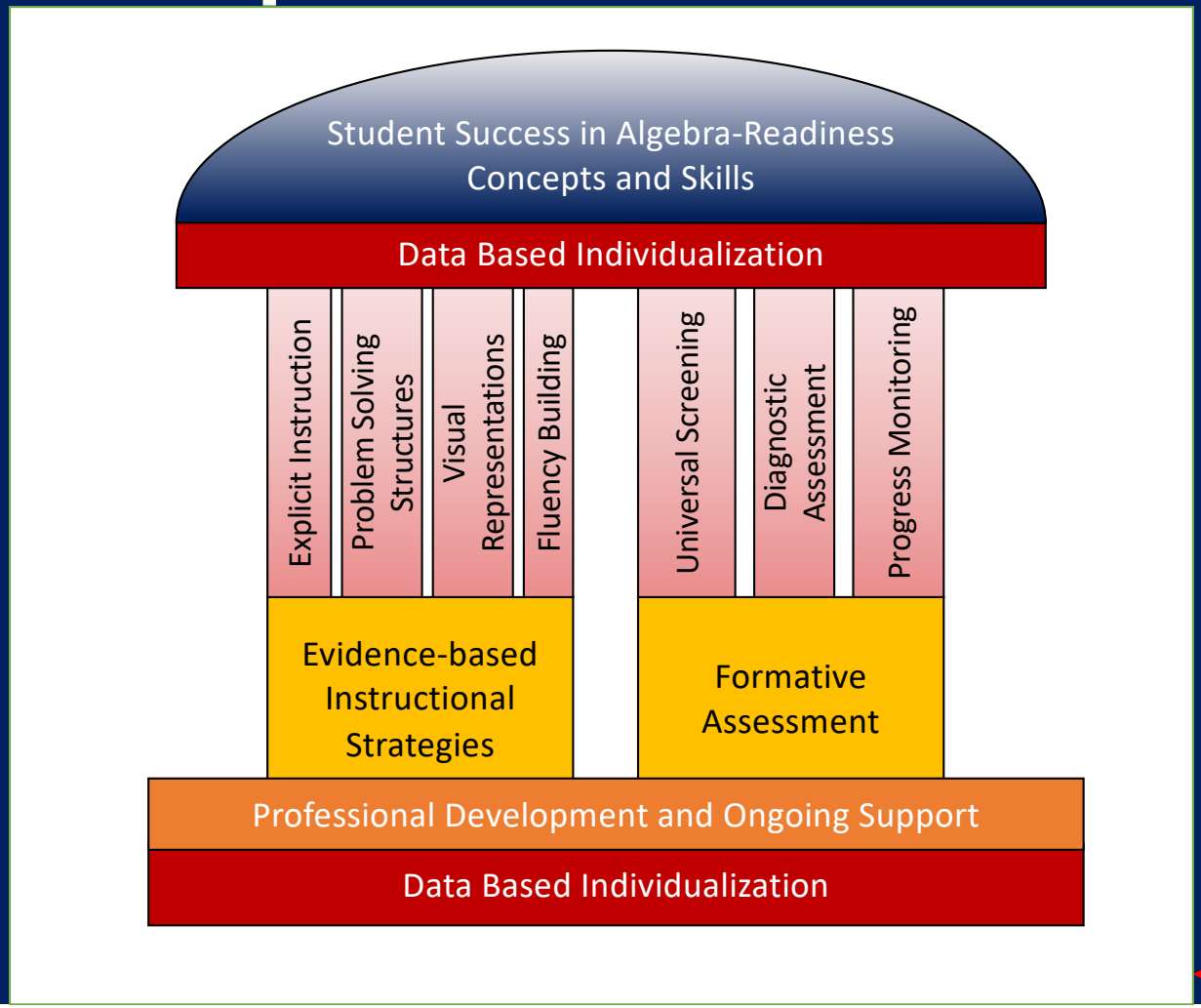


Project STAIR

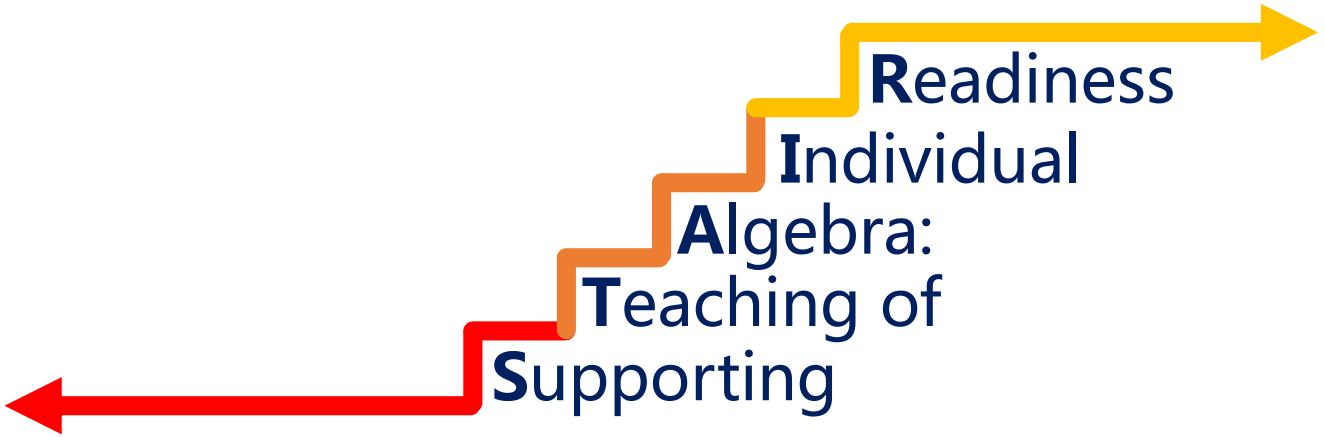
- Supporting Teaching of Algebra: Individual Readiness
- Intensive intervention in middle schools
  - Systems-level perspective
  - Data-based individualization
- Goal → preparation for Algebra 1
- Four-year model demonstration project



Description of the Model



Data-based Individualization

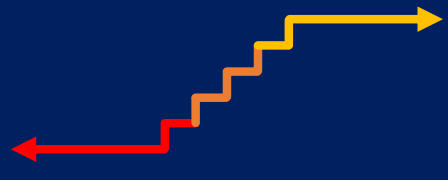


Data-based Individualization

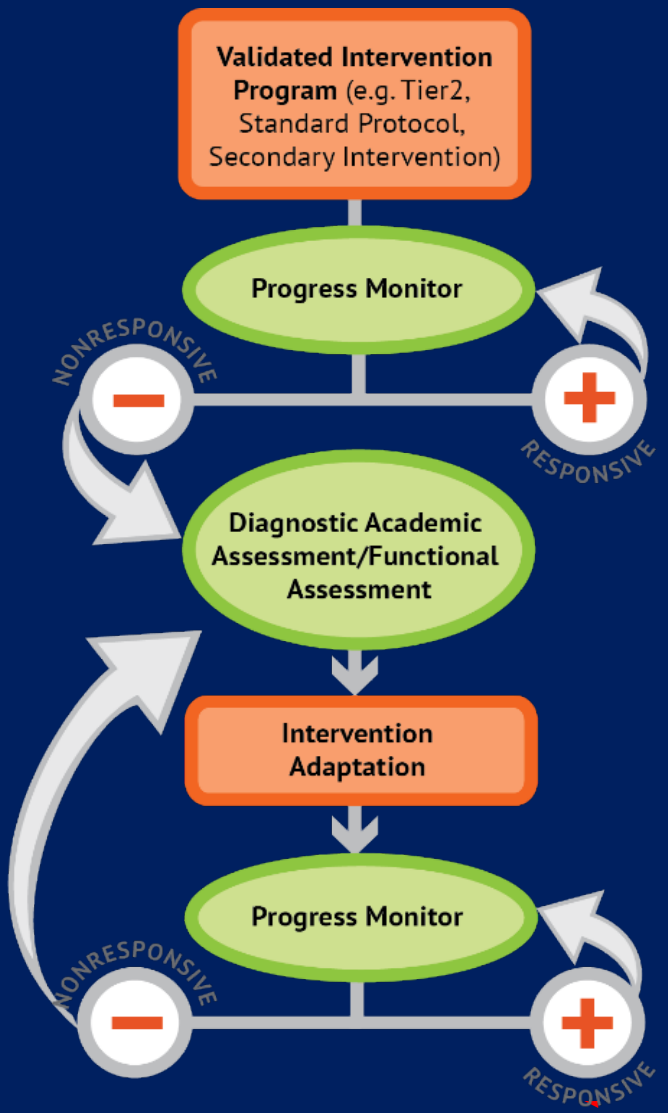
Is…	Data-Based Individualization	Is not…

- A systematic *framework* for making instructional decisions
- A dynamic *process* of ongoing assessment and intervention
- Intended to support students with intensive needs
- Based on MTSS framework

- A curriculum
- An assessment
- A single intervention

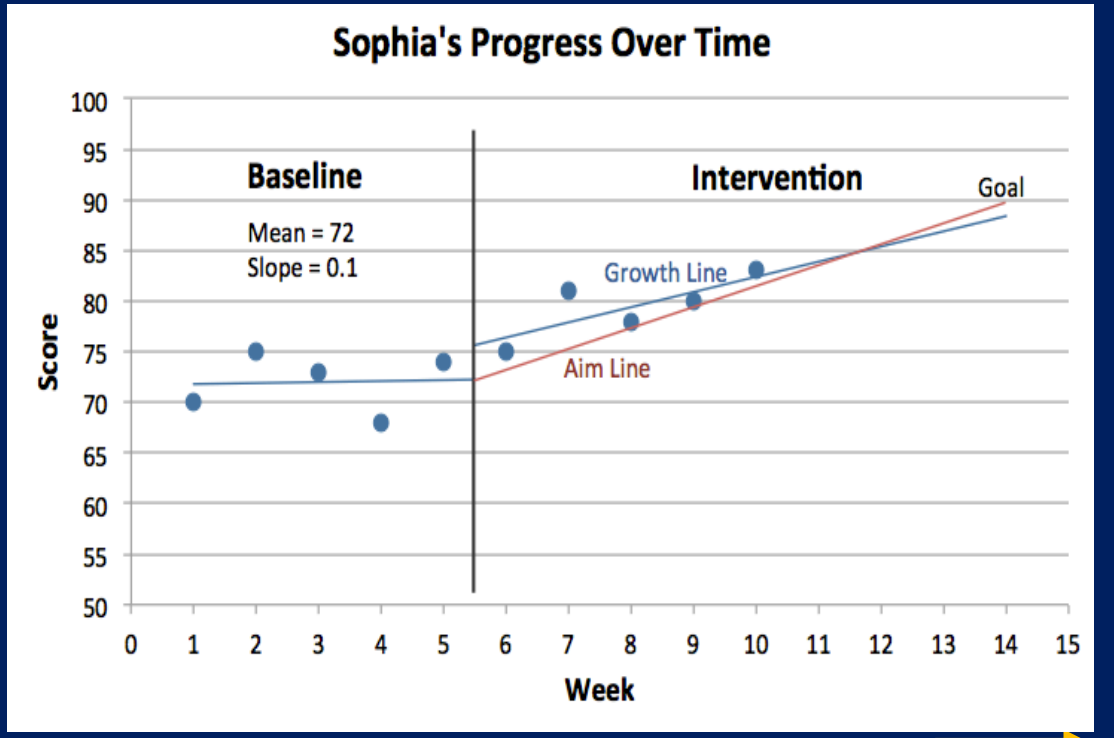


Key Components of DBI

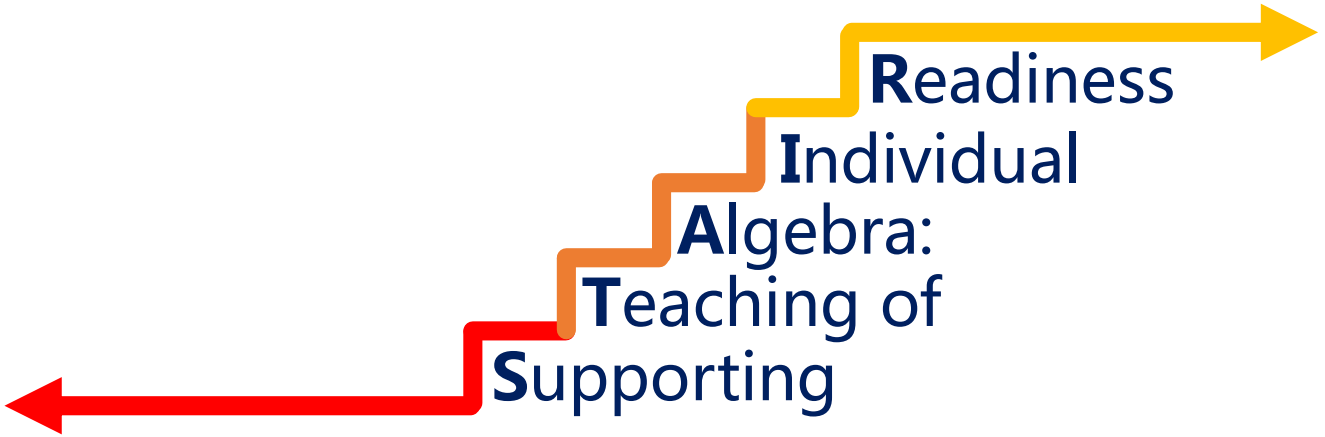


Steps in Progress Monitoring

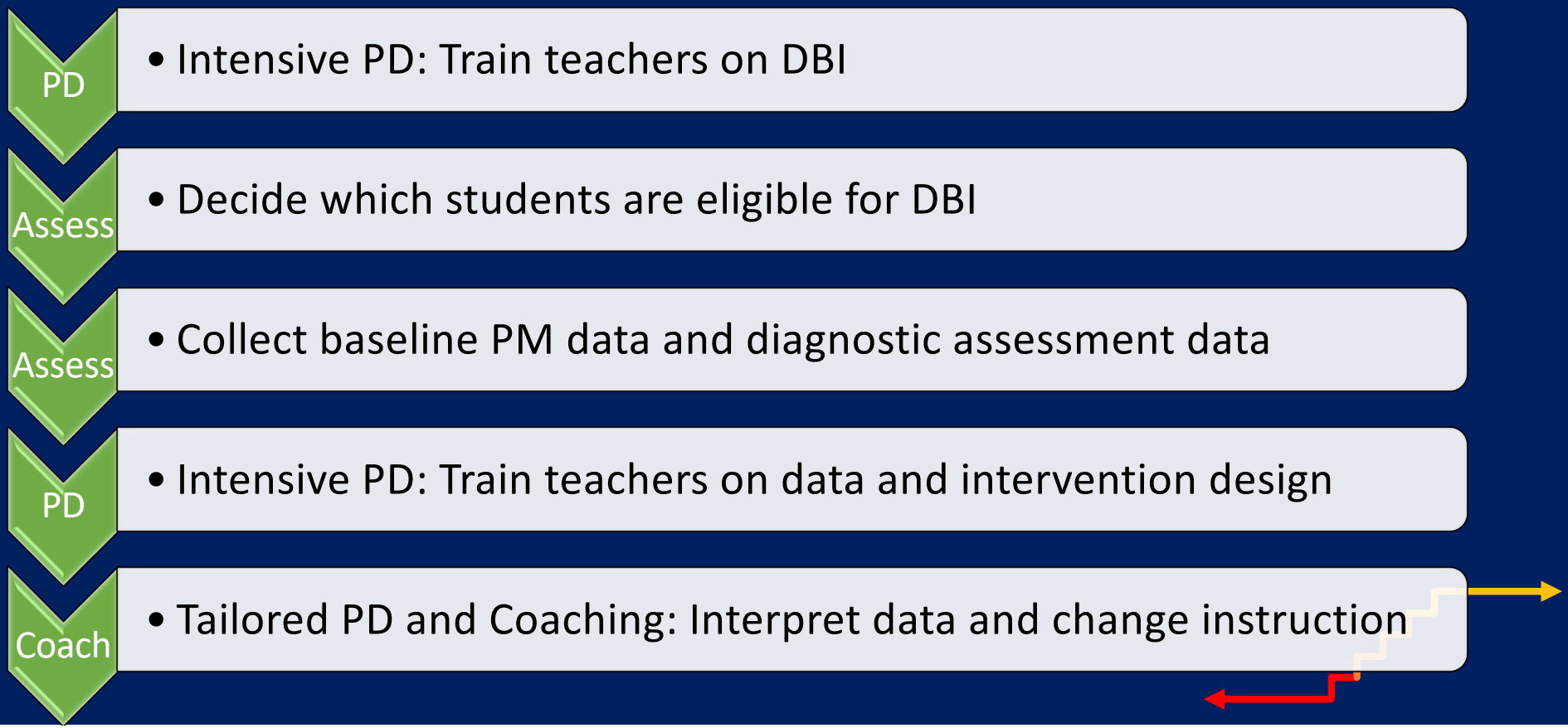
1. Gather baseline data
2. Set performance goals
3. Implement the intervention
4. Administer progress monitoring probes at regular intervals
5. Evaluate the student's progress



Project STAIR Intervention



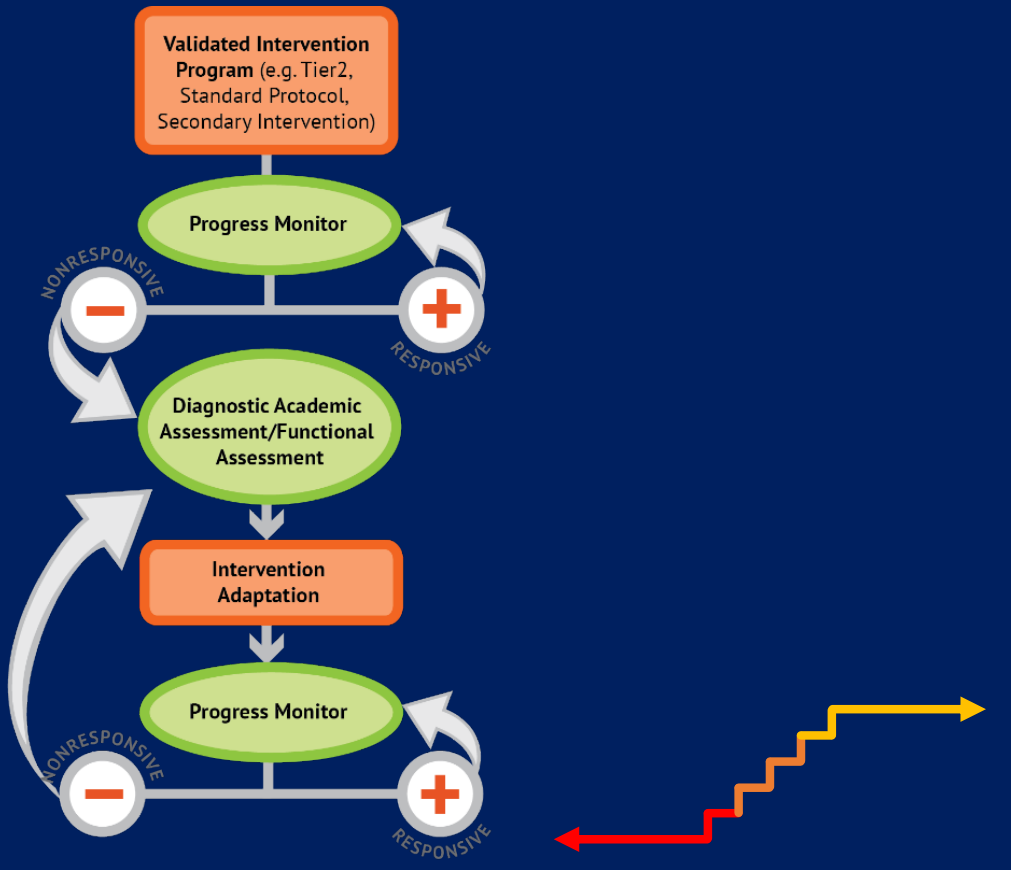
Flowchart for Project STAIR



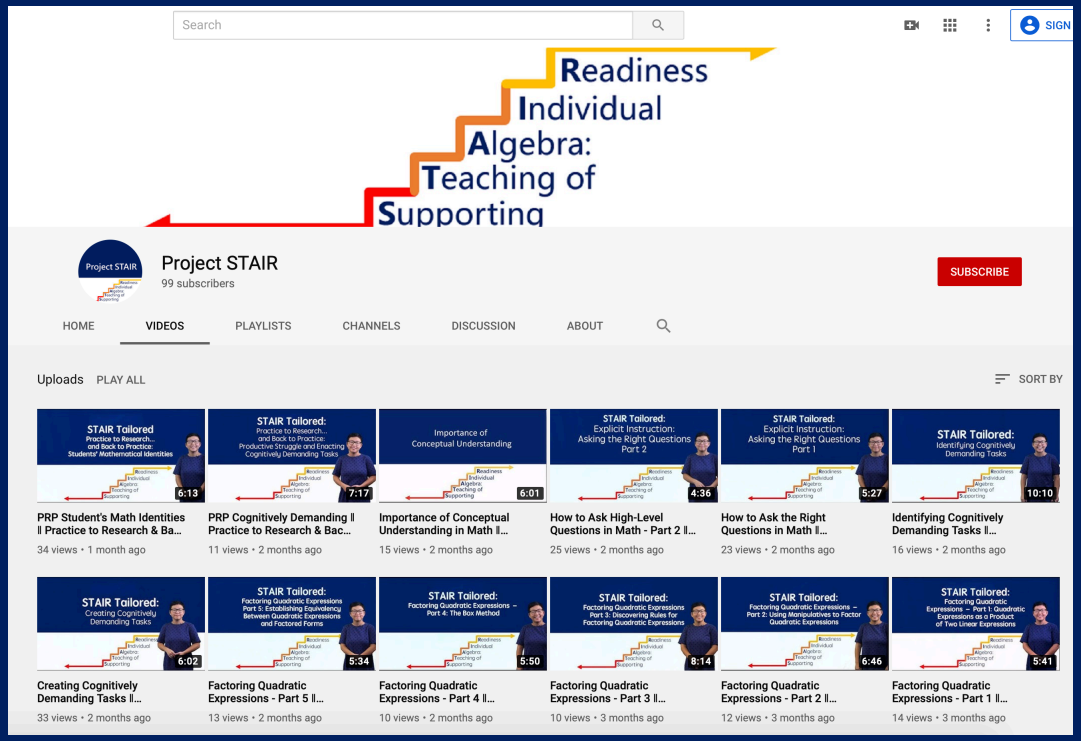
Sequence of Intensive and Tailored Professional Development

- Day 1: Framework of Data-based Individualization
- Two primary components
  - **Day 2: Assessment**
  - **Day 3: Instruction**

Tailored PD

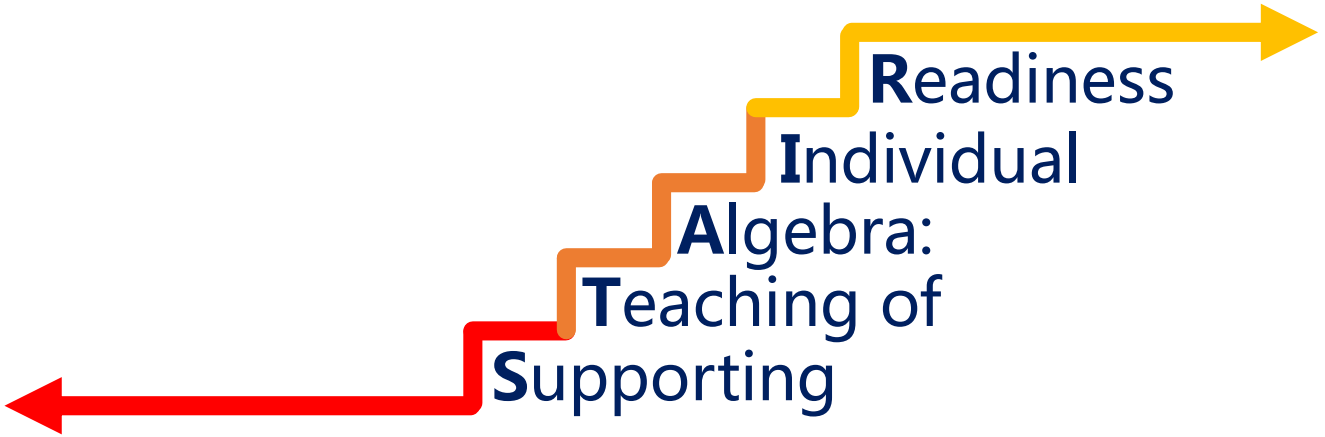


Tailored PD:
Coaching and Just-in-time Videos



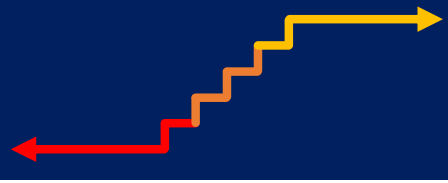
YouTube Channel:
Project STAIR

Year 1 Pilot Study



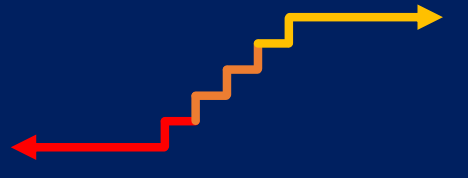
Research Questions

- What impact does Project STAIR have on teacher and student outcomes:
  - Does participation impact teachers' capacity, confidence, and self-perception associated with implementing DBI?
  - Does teachers' participation impact student proximal and distal outcomes?
- What changes are needed to the Project STAIR intervention to improve teacher and student outcomes?



Participants

- 22 teachers from 4 schools in Texas and Missouri
  - 53% had previous PD on using data to improve instruction
  - 58% had previous PD on math assessment
- 56 eligible students (identified as needing intensive intervention)
  - Approximate equal distribution across grades 6-8
  - 59% female
  - 46% African American, 29% Caucasian, 20% Hispanic/Latinx
  - 16% dual language learner; 16% receiving special education



Measures

Student	Sep	Oct	Nov	Dec	Jan
Universal Screener (STAR)	X				X
Diagnostic Assessment (DOMA)	X				X
Progress Monitoring (ARPM)	Weekly	Weekly	Weekly	Weekly	Weekly
Algebra Achievement (IAAT)	X				X
Teacher					
Teacher Instructional Practice Survey	X				X
Self-efficacy Survey	X				X

Results: Teacher-level Effects

- Paired samples *t*-tests to examine pre- to post-test changes

	Understanding	Importance	Confidence	Frequency of Use
DBI Content Knowledge	+	-	-	-
Evidence-based Instruction	+	-	-	-
Assessment	+	+	+	-

+ = significant at $p<.05$; - = not significant at $p<.05$

Results: Teacher-level Effects

	Significant Change
I like to teach math.	+
I can effectively teach math.	+
I am confident in my ability to teach math to the students in the grade I teach.	+
I am confident that I can answer questions about math.	-
I would be confident if my supervisor wanted to observe me teaching a math lesson.	-
I know how to do the math, and am comfortable explaining how I got my answer.	-
I understand math concepts, and I am able to do the steps to solve the problem.	-

+ = significant at $p<.05$; - = not significant at $p<.05$

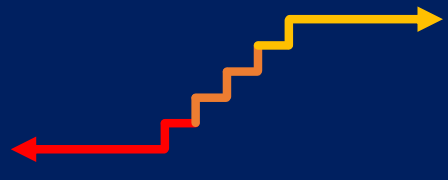
Results: Student-level Effects

- 2-level multi-level modeling
  - Unconditional, 2-level models of students nested in teachers

	Significant Change	% variance explained by teacher differences
Proximal Measure: ARPM Number Properties	+	-
Proximal Measure: ARPM Quantity Discrimination	+	36%
Proximal Measure: ARPM Proportional Reasoning	-	8%
Distal Measure: DOMA	-	33%
Distal Measure: IAAT	-	34%

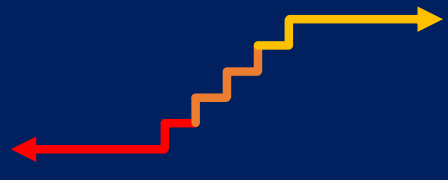
Discussion: Effects of Project STAIR

- Teachers:
  - Project STAIR was effective at improving teachers' understanding of DBI, instruction, and assessment
  - Project STAIR was effective at improving teachers' perception of importance and confidence in using data
- Students:
  - Project STAIR was effective at improving outcomes on proximal measures



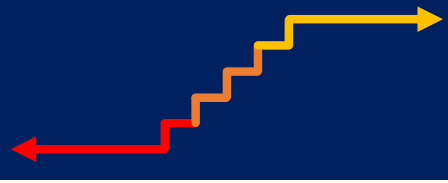
Improvements for Project STAIR

- Strategies for implementation (no change in frequency)
  - May be a measurement issue (need direct measures)
  - Include more strategies to support teachers' implementation of DBI in PD and in coaching
- Emphasize importance and build confidence in DBI and instruction (no changes)
  - May be more stable constructs; need sensitive measures
  - Target during coaching



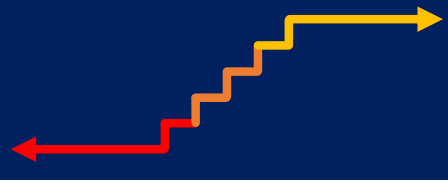
Implications for Practice

- DBI → possible solution to achievement crisis
  - Support teachers with a framework
- Project STAIR PD improves some teacher outcomes
  - Attends to systems-level factors
  - Comprehensive model with ongoing support
- Improving teachers' understanding, importance, and confidence using data may improve student outcomes



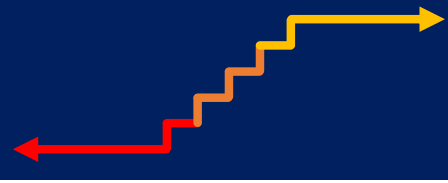
Limitations

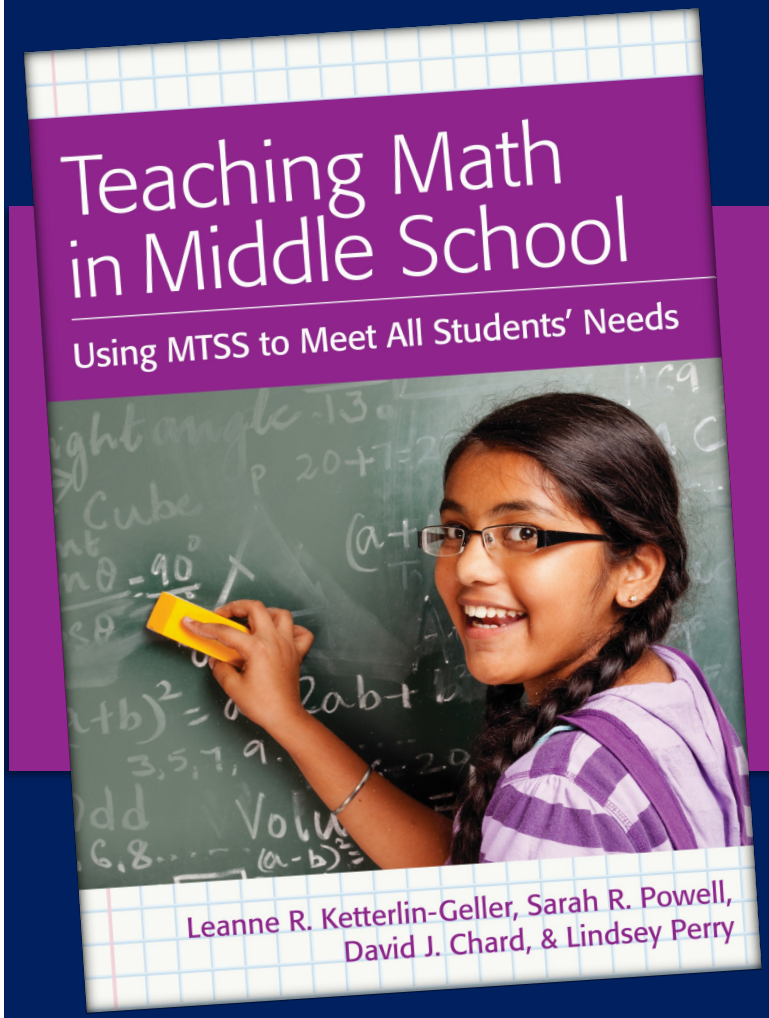
- No comparison group
- Small sample size
- Limited implementation window
- Measures: Researcher-created and self-report



Future Directions

- Changes for 2019-20:
  - Implementation with a randomly-assigned comparison group
  - Intensified PD
  - Structured coaching sessions to identify teacher needs more precisely





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- Choose and use effective supports
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