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The University of Iowa

Managing Challenging Behavior Using Data-Based Individualization

University of Iowa
Dr. Allison Bruhn

Acknowledgements

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Agenda

- Provide context for existing work in data-based individualization
  - Focus on self-monitoring interventions
- Introduce the DBI framework
- Describe results of recent teacher training and research in DBI
  - Student outcomes
  - Teacher perceptions

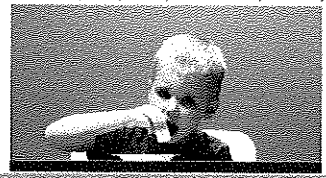
The Marshmallow Test

Self-Determination

- Overarching term for a group of related skills, beliefs, and, behaviors aimed at improving the quality of life through achieving independence across the life span
  - *Subcategories:* choice-making, decision-making, goal-setting, problem-solving, self-advocacy, self-efficacy, self-knowledge, and self-management/regulation
    (Wehymeyer & Field, 2007)

Self-Determination

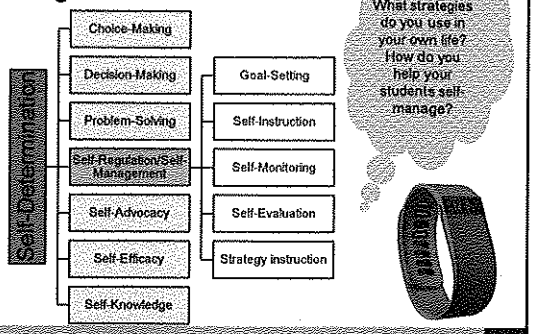
- Unfortunately, many students with and at-risk for emotional and behavioral disorders lack self-determination skills such as self-regulation
  - These skills are critical for academic success and developing positive social relationships (Cameto, Levine, Wagner, & Marder, 2004; Carter, Lane Pierson, & Glaser, 2006)



What does it mean to be a self-regulated learner? (Arslan, 2014)

- Establish goal
- Determine strategies that support progress toward that goal
- Apply strategies
- Monitor progress toward goal

A focus on self-regulation/self-management



What is self-monitoring?

- A meta-cognitive skill that involves:
  (a) teaching students to be aware of their behavior, and then
  (b) students recording whether or not the behavior occurred
- Additional components:
  - Reinforcement
  - Feedback
  - Technology
  - Graphing

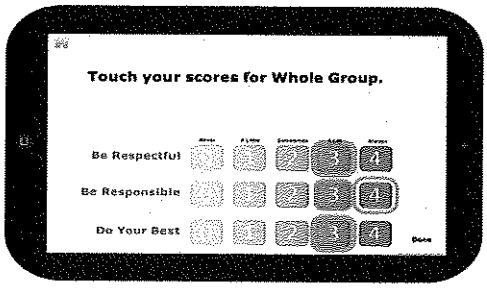
A research-based intervention demonstrating positive effects across age, gender, disability, and setting

Example of "in the moment" self-monitoring: Are you in your seat right now?

Behavior: In Seat		
Interval	Yes	No
1:00	X	
2:00	X	
3:00		X
4:00	X	
5:00		X
6:00	X	
7:00	X	
8:00	X	
9:00	X	
10:00	X	
Total	80%	20%

Goal: During math class, Juan will be in his seat for 80% of intervals each day for a week

Example of "retrospective" self-monitoring: Did you meet classroom expectations during whole group instruction?



DBI Using a Self-Monitoring App: Real-World Examples

Self-Monitoring Intervention App

11/4/16

Who are you?

Teacher

Student

A B C D E

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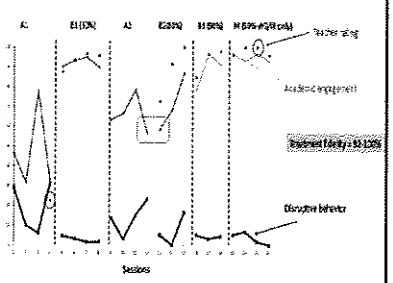
Henry

- 6th grade student
- Special education services in Level II/III classroom
- Long, complex behavior history (e.g., eloping, tantrums, police, etc.)
  - 21 ODRs in previous year
  - SDQ: scored in abnormal range on conduct problems and hyperactivity/inattention
  - SSIS: bottom 1% for social skills, 82%ile for problem behavior
- Beginning reader (BR) according to Scholastic Reading Inventory (SRI)—schoolwide reading screener



Bruhn, Vogelgesang, Fernando, & Lugo, 2016

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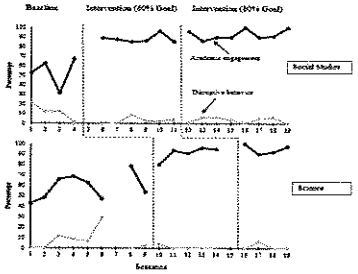
Trey

- White, 7th grade, male
- Poor home life
- Lack of engagement
- SDQ: total difficulties = slightly raised to high risk



TI Soc St = 100%
TI Science = 100%
IOA AE = 90-100%
IOA DB = 94-100%

Bruhn, Woods-Groves, Fernando, Choi, & Troughton (in press)

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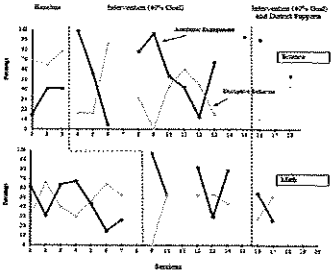
Anna

- White, 6th grade, female
- IEP with reading & math goals, no behavioral goals (despite ADHD, OCD, PTSD)
- Lack of engagement, highly disruptive & defiant
- SDQ: Total difficulties = very high risk



TI Science = 83-100%
TI Math = 67-100% (X = 91%)
IOA AE = 90-99%
IOA DB = 91-100%

Bruhn, Woods-Groves, Fernando, Choi, & Troughton (in press)

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Building Capacity

- How can we get teachers to provide high-quality intervention and make data-based decisions within intervention?
- Can we teach them a systematic process that is effective, useful, and feasible?

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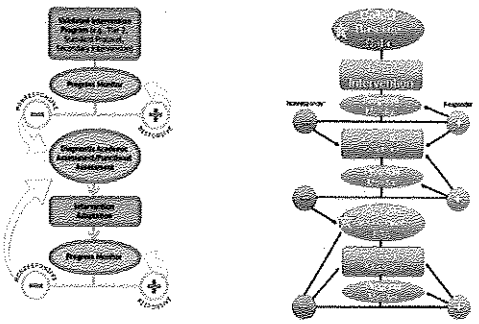
The DBI Framework

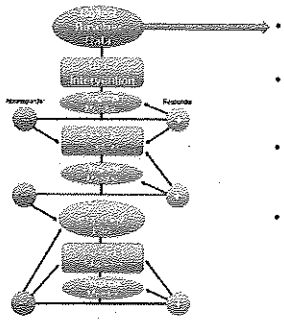
Data-Based Individualization (DBI)

- DBI is "a systematic method for using data to determine when and how to provide more intense (or less intense) intervention"
  - DBI is a process, NOT a single intervention or strategy
  - DBI is NOT a one-time fix
    - ***On-going process of intervention and assessment adjusted over time***

Adapted DBI

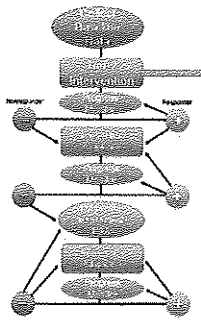


Step 1: Collect Baseline Data



- What are baseline data?
  - Data collected prior to intervention being in place
- Why collect baseline data?
  - Comparison to intervention data—is intervention working?
- When and how long do I collect baseline data?
  - No rules, 3-5 days recommended
- How do I collect baseline data?
  - Select method of measurement (intervention dependent)

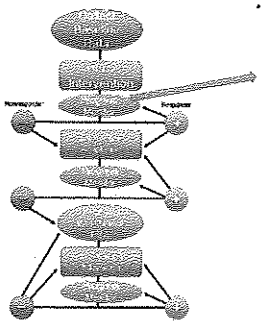
Step 2: Implement Intervention



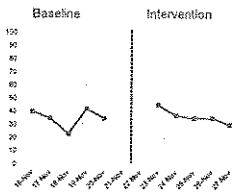
- Plan, Prep, & Practice
- Did the student receive adequate training on intervention?
  - Teach, Model, Pr
- Has the intervent implemented for a amount of time to response?
  - Create calend
- Has the intervention been implemented with fidelity?
  - ALL components, ALL the time

"Don't do two things half-ass. Do one thing whole-ass." *-Jon Lester*

Step 3: Progress Monitor

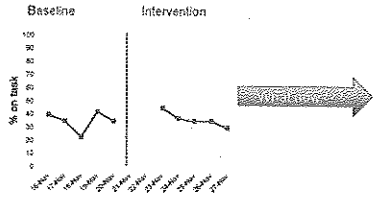


- Do data indicate the student is responding to intervention?
  - Graph data and observe graph to determine:
    - How does the behavior compare to baseline?
    - Is the behavior better or worse?
    - Is the behavior stable?



Step 3: Progress Monitor

- Do data indicate the student is responding to intervention?
  - No = nonresponder
  - Yes = responder



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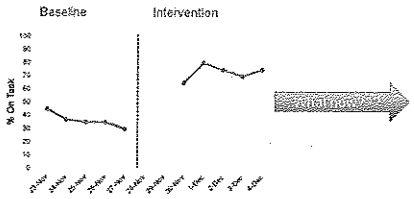
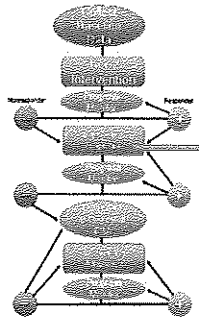


Step 4: Intervention Adaptation



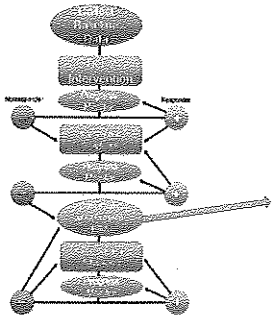
- Nonresponders = intensify intervention
- Responders = fade intervention (or continue as is and progress monitor)

We should NOT be doing the same thing for responders and non-responders!

Step 4: Intervention Adaptation

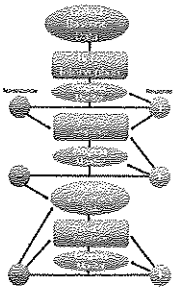
NONRESPONDERS	RESPONDERS
• Goal – Lower the goal	• Goal – Raise the goal
• Frequency – Increase the frequency of intervention	• Frequency – Decrease the frequency of intervention
• Feedback – Increase the frequency of feedback	• Feedback – Provide less frequent feedback
• Reinforcement – Add a reward for meeting the daily goal – Provide reward choice	• Reinforcement – Increase the contingencies (e.g., must meet goal 3 days in a row to receive reward) – Change the reward, provide choice – Fade to praise only
• Add Components – Self-graphing – Prompts/incidental teaching – Check-Ins	• Remove Components

Step 5: Diagnostic/FBA for Nonresponders



- Academic assessments
  - CBM
  - Other standardized tools
- Behavioral screening tools
  - SDQ
  - BASC-2
  - SSIS
- Functional Behavior Assessment (FBA)
  - Interviews
  - Records review
  - Direct observation (A-B-C)

Data-Based Individualization



- DBI is "a systematic method for using data to determine when and how to provide more intense (or less intense) intervention"
  - DBI is a process, NOT a single intervention or strategy
  - DBI is NOT a one-time fix
    - ***On-going process of intervention and assessment adjusted over time***

Current Training and Research

"Improving Intervention Implementation Using Data-Based Individualization"

- 16 gen ed/sped teachers (4th-6th grade) attending 5-part professional development series (Nov-Mar)
  - All running their own studies with a student demonstrating challenging behavior
  - Graduate assistants collecting fidelity data 1x/wk
  - Mixed-method analysis (Student outcomes = single-subject & descriptive; Teacher outcomes = qualitative & quantitative)

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"Improving Intervention Implementation Using Data-Based Individualization"

- Student Outcomes:
  - What are the effects of data-based individualization within technology-based self-monitoring on 4th-6th grade students with serious challenging behavior?
- Teacher Outcomes:
  - What are teachers' perceptions of their understanding of, self-efficacy in using, and utility of data-based individualization before, during, and after training and implementation?

"Improving Intervention Implementation Using Data-Based Individualization"

Session 1: Introduction to Self-Monitoring (NOVEMEBER 8th 2016: ½ day)

Content Objectives:	*Implementation Objectives:*	*Evaluation Objectives:*
Participants will… 1. Learn about self-monitoring (what it is, who can benefit from it, research on effects) 2. Learn about self-monitoring (what it is, who can benefit from it research on effects, how to use it) 3. Practice using self-monitoring app	Participants will… 1. Create a list of potential students who meet inclusion criteria 2. Review consent forms 3. Take consent forms to school and send home to parents of students meeting criteria	Participants will… 1. Complete pre-self-assessment

"Improving Intervention Implementation Using Data-Based Individualization"

Session 2: Introduction to Data-Based Individualization (DECEMBER 6th 2016: ½ day)

Content Objectives:	*Implementation Objectives:*	*Evaluation Objectives:*
Participants will… 1. Learn about DBI (what it is, why it is important) 2. Discuss DBI in terms of app (how to individualize based on app data) 3. Practice DBI by analyzing data sets and making decisions 4. Program app for use (i.e., student name, behavior to be measured, interval system)	Participants will… 1. Return signed consent forms 2. Create implementation calendar for collecting baseline data using app and pre-assessment data	Participants will… 1. Complete IRP-15 pre-assessment

"Improving Intervention Implementation Using Data-Based Individualization"

Session 3: Baseline Data and Intervention Implementation (JANUARY 17th 2017: 2 hr)

Content Objectives:	*Implementation Objectives:*	*Evaluation Objectives:*
Participants will… 1. Review DBI 2. Analyze baseline data from student participants	Participants will… 1. Create implementation plan and calendar for student self-monitoring using app	Participants will… 1. Return pre-assessment (2nd quarter) and baseline data 2. Complete mid-self-assessment

"Improving Intervention Implementation Using Data-Based Individualization"

Session 4: Intervention Data Analysis (FEBRUARY 7th 2017: 2 hr)

Content Objectives:	*Implementation Objectives:*	*Evaluation Objectives:*
Participants will… 1. Analyze intervention data from student participants 2. Discuss DBI decisions about continuing, adapting, or discontinuing app	Participants will… 1. Revise implementation plan and calendar based on discussions of DBI decisions	Participants will… 1. Engage in semi-structured interviews about usability and feasibility of app and DBI

"Improving Intervention Implementation Using Data-Based Individualization"

Session 5: Final Analysis (MARCH 9th 2017: 2 hr)		
Content Objectives: Participants will… 1. Conduct summative analysis on all data collected within SCORE IT 2. Compare and contrast analyses with other participants	*Implementation Objectives:* Participants will… 1. Revise implementation plan and calendar for 4th quarter	*Evaluation Objectives:* Participants will… 1. Return post-assessment (3rd quarter) data and intervention data 2. Complete post-self-assessment 3. Complete IRP-15

Participants: Teachers

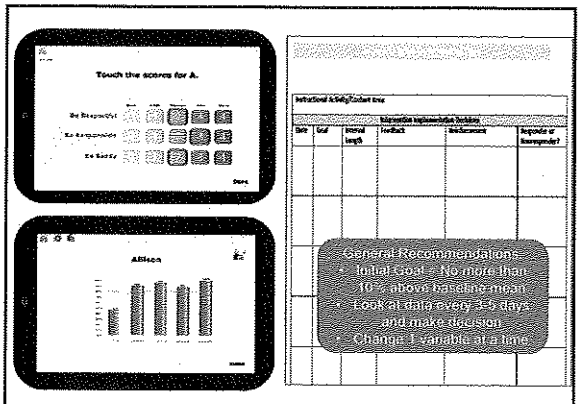
- N = 16
- Years of experience = 3 to 35 (Mean = 15)
- 14 Female, 2 Male
- 12 White, 3 Black, 1 Mixed
- 4 BAs, 10 MAs, 2 PhDs,
- 4 SPED teachers, 12 Gen Ed teachers

Participants: Students

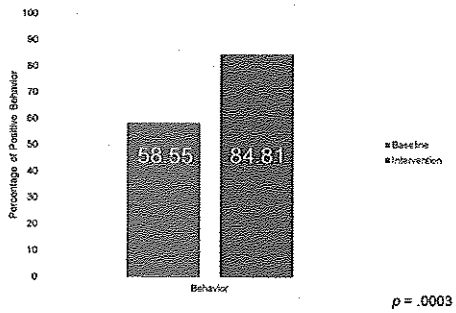
- N = 17
- 15 Male, 2 Female
- 11 White, 3 Black, 2 Mixed, 1 Hispanic
- 3rd grade = 2, 4th grade = 6, 5th grade = 5, 6th grade = 4
- Nominated due to high rates of off-task behavior & poor academic performance, ODRs or screening score, IEP behavioral goals, or EBD diagnosis

Teacher Demographics							Student Demographics					
ID	Years of Experience	Educator Status	Gender	Ethnicity	Highest Degree		Inclusion Criteria	Gender	Ethnicity	Grade Level	Sped Status	Behaviors Monitored
A	5	GE	F	W	B		1,4	M	W	6	NA	Be Ready, Be Responsible, Be Respectful
C	15	GE	F	W	B		1	F	W	4	NA	Be Respectful, Be Responsible, Be Ready
D*	26	SPED	F	NR	M		3	M	NR	3	SPED	Be Responsible, Follow Directions, Be Productive
E	13	SPED	F	W	M		3	M	W	5	SPED	Be Ready, Be Responsible, Be safe
F	10	GE	M	W	M		1	F	W	5	NA	Be On-Task, Be Productive
G	26	GE	F	W	M		3	M	W	6	SPED	Be On-Task, Be Responsible, Be Respectful
H	5	GE	F	B	B		1,2	M	B	5	NA	Be Respectful, Be Responsible, Positive Interactions
I	6	GE	M	W	M		1	M	W	5	NA	Be Productive, Be Responsible, Be Ready
J*	26	SPED	F	NR	M		3	M	NR	6	SPED	Be Respectful, Be Responsible, Be Ready
K	35	SPED	F	W	D		1	M	W	3	SPED	Be On-Task, Be Productive, Be Ready
L	3	GE	F	W	B		1	M	W	5	SPED	Be On-Task, Be Productive, Best Effort
M	15	GE	F	B	M		1,3	M	B	6	SPED	Be On-Task, Positive Interactions, Be Productive
N	23	SPED	F	W	M		1	M	H	4	SPED	Be Ready, Be Focused, Be On-Task
O	11	GE	F	B	M		1,2	M	W	4	NA	Work Independently, Be On-Task, Follow Directions
P	16	GE	F	W	PhD		1	M	Mixed	4	SPED	Be Respectful, Be Responsible
Q	8	GE	F	Mixed	M		1	M	Mixed	4	SPED	Be Respectful, Be Responsible
S	10	GE	F	W	M		1	M	B	4	NA	Be Respectful, Be Ready, Be Productive

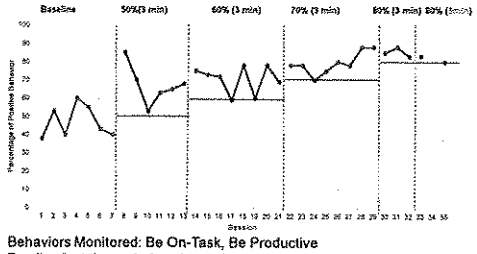
- * = same teacher
- Inclusion criteria: 1 = high rates of off-task behavior & poor academic performance, 2 = ODRs or screening score, 3 = IEP behavioral goals, 4 = EBD diagnosis



Overall Outcomes for Behavior

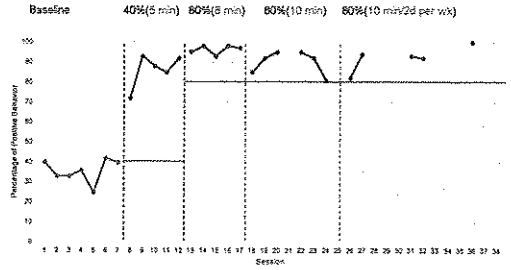


Individual Outcomes: Goal Change



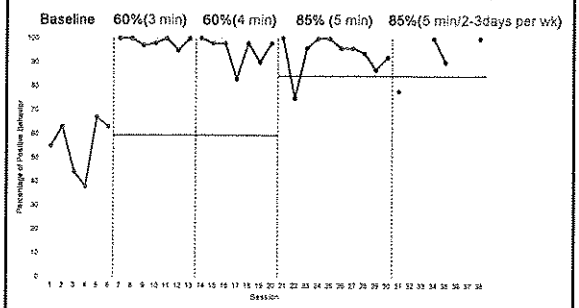
- Behaviors Monitored: Be On-Task, Be Productive
- Feedback at the end of each session
  - "I think my secret was the student. It was the perfect intervention for her. Her mom at conferences mentioned that her daughter explained how she would always check to see how much time was left before needing to score. She mentioned how her daughter mentioned she would space off, touch the iPad and realize she needed to get back on task. So I attribute it to a student that just needed a visual reminder. Having the iPad on her desk gave her ownership in monitoring her time on task."

Individual Outcomes: Interval and Goal Change



- Behaviors Monitored: Work Independently, Be On-Task, Follow Directions
- Feedback on Thursdays

Individual Outcomes: Interval, then Goal Change

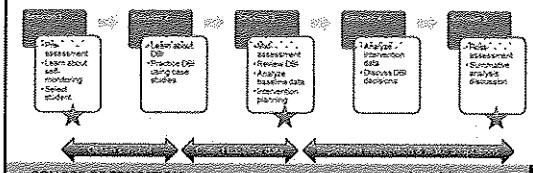


- Behaviors Monitored: Be On-Task, Be Responsible, Be Respectful
- Feedback: End of session
- Reinforcement: Accuracy Matching, choice provided at end of session

Teacher Perceptions of DBI

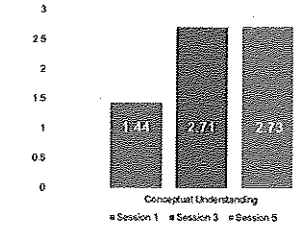
★Assessed after Sessions 1, 3, & 5

- Conceptual understanding
- Self-efficacy
- Usability/Feasibility
  - Adapted from Lane, Menzies, Bruhn, & Crnobori, 2010



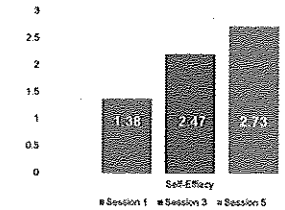
DBI Conceptual Understanding

0 = I do not understand this concept.
1 = I understand this concept a little, but probably not enough to explain it to others.
2 = I understand this concept.
3 = I understand this concept and could explain it to others.



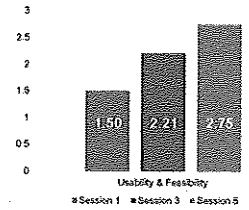
DBI Self-Efficacy

0 = I do not have the ability to use this in my classroom yet.
1 = I may be able to use this in my classroom, but I need more training.
2 = I can use this in my classroom.
3 = I can definitely use this in my classroom and help others use this as well.

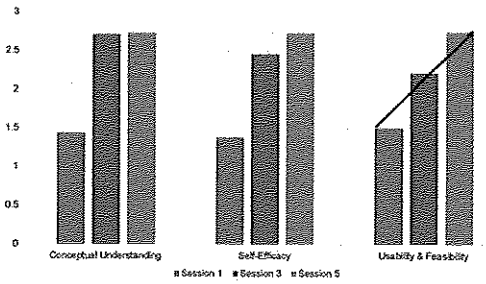


DBI Usability & Feasibility

0 = This is not useful and/or practical in my classroom.
1 = This has the potential to be useful and/or practical in my classroom.
2 = This is useful and practical in my classroom.
3= This is useful and practical in my classroom and I would recommend it to other teachers.

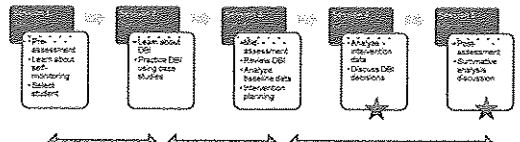


Overall Perceptions of DBI



Teacher Perceptions of DBI

★Focus groups after sessions 4 & 5
- Open-ended questions related to understanding, implementation, self-efficacy, practicality, and future directions



How did using the app and data-based individualization fit into the structure and flow of your classroom?

- Due to the very hands-on nature of the class it has been a little tricky.
- It could be interrupting if used while teacher is physically teaching and speaking to class.
- It fits well but it does become hard to monitor actively when I'm with a guided reading group.
- It interrupted the flow slightly...sometimes I have to stop working with a group or student to score.
- I could see it being more challenging during whole group instruction.

- It fits in easily and is very accessible no matter what we are doing in the classroom.
- It has been good during independent work time.
- Seamless at this point!
- It was great for me because I got a good picture of how the student was doing in the gen ed classroom and I don't always get much time for that.
- I feel making data-based decisions has been valuable. When we reflect on meeting the goal, you can see the student beam with pride.

If you were advising other teachers on self-monitoring and/or DBI, what advice would you give them?

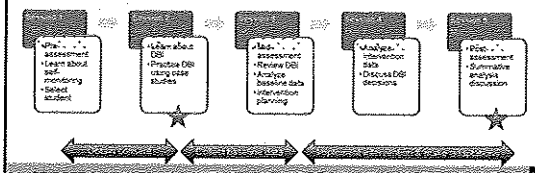
- "Make sure to take baseline data."
- "Be consistent...do what you set up to do."
- "Implement with fidelity. Don't cut the intervention cold turkey and use the data to inform decisions, not just gut."
- "Use the check-in time to build relationships."

After having been through this training series, would you feel comfortable implementing this same intervention and DBI with another student? Why or why not?

- "Yes, because it's very simple and very reflective for the student."
- "Yes. First of all, other students are asking to use the iPad! But, yes, I was surprised that the intervention actually worked. So, I would be interested in trying this with other students as a way to intervene before I bring up the student as a behavior concern to our school team."
- "Yes - After my kiddo was deemed a responder, I noticed many others who would benefit (mostly for off-task/attention behaviors)."

Teacher Perceptions of Intervention

- ★Assessed after session 2 (pre-implementation) and session 5 (post-implementation
  - Intervention Rating Profile-15 (IRP-15)
    - 15 Items rated 1-6, Total possible = 90



Intervention Rating Profile-15

Item	Statement	Pre Average	Post Average
1	This is an acceptable intervention for the student's problem behavior.	5.00	5.44
2	Most teachers would find this intervention appropriate for behavior problems in addition to the one described.	4.63	5.06
3	This intervention should prove effective in changing the child's problem behavior.	4.63	5.00
4	I would suggest use of this intervention to other teachers.	4.38	5.56
5	The child's behavior problem is severe enough to warrant use of this intervention.	5.00	4.94
6	Most teachers would find this intervention suitable for the behavior problem described.	4.56	5.25
7	I would be willing to use this intervention in the classroom setting.	5.27	5.44
8	This intervention would not result in negative side-effects for the child.	4.44	5.44
9	This intervention would be appropriate for a variety of children.	4.88	5.38
10	This intervention is consistent with those I have used in classroom settings.	4.38	4.69
11	The intervention is a fair way to handle the child's problem behavior.	4.56	5.38
12	This intervention is reasonable for the behavior problem described.	4.69	5.44
13	I like the procedures used in this intervention.	4.56	5.25
14	This intervention is a good way to handle this child's behavior problem.	4.75	5.38
15	Overall, this intervention would be beneficial for the child.	4.81	5.44
	Total	70.19	79.06

$p = .0018$

Next Steps: What it we could get the app to help teachers with DBI by providing data-based recommendations?

Data-Based Individualization

Teacher-led → Technology-led

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Project SCORE IT: Developing and Evaluating Interactive Technology to Support Self-Monitoring and Data-Based Decision-Making

ies INSTITUTE OF EDUCATION SCIENCES

Year 1
- Pilot digitizing and data analyses of 80 self-monitoring studies
- Develop decision rules and apply them to existing data
- Teacher focus groups
- Reprogramming of app into "expert system"

Year 2
- Usability & feasibility testing across sites
- Adjustments to decision rules/programming

Year 3
- Randomized control trial across sites
- Adjustments to decision rules/programming

Time for Questions

- **Contact Info**

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