



# **EVIDENCE-BASED RESEARCH AND EVALUATION SUPPORTING BOUNDLESS LEARNING**

K. Lynne Harper Mainzer, Ed.D.

May 14, 2017

# EVIDENCE-BASED RESEARCH SUPPORTING BOUNDLESS LEARNING

## Research Areas

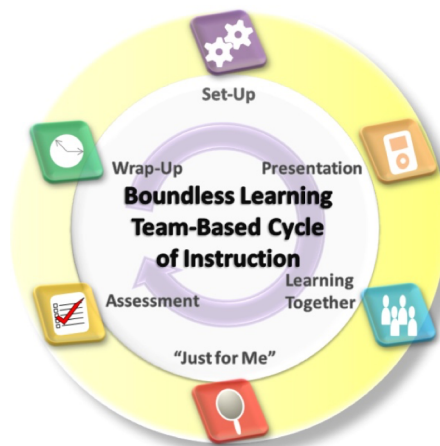
Boundless Learning is anchored in research that supports evidence-based instructional processes, such as structured cooperative learning, goal setting with feedback, explicit instruction, positive behavioral management, and use of protocols. Each of these areas have extensive research that indicate significant effect sizes for supporting increases in student learning (Hattie, 2015; Marzano, 2017). Cooperative learning is a cornerstone of Boundless Learning with over 50 years of extensive research showing its use produces significant effects related to engagement, achievement, and mutual concern (Johnson & Johnson, 1998; Slavin, Madden, & Leavey, 1984). A recent synthesis of 20 high-quality research studies—randomized experiments and quasi-experiments—indicated impressive achievement results (+.29 effect size) for teachers using instructional processes that emphasize **cooperative learning** and **behavior management** (Slavin & Lake, 2007; Slavin & Lake, 2008).

In regards to cooperative learning, Marzano and Hattie agree that structuring opportunities for students to work and learn together in groups adds value to whole-class instruction (+.41 effect size) as well as to individual work (+.59-.78 effect size) (Killian, 2015). Additional aspects of cooperative learning integral to its success are **goal-setting** and **feedback**, which have been noted as high impact strategies with effect sizes at +.40 and +.73, respectively (Hattie, 2015). In fact, Hattie (1992) notes that feedback is one of the most powerful strategies for advancing achievement.

Effects of cooperative learning are strengthened by the use of **effective behavior management techniques** (Slavin & Lake, 2007). The importance of providing clear expectations, community learning standards, and recognition procedures along with specific techniques for managing individual and team behavior cannot be overstated when creating positive, inclusive learning environments. Effective use of effective behavior management methods can decrease disruptions, increase student engagement, and improve student achievement. In fact, a meta-analysis by Marzano (2003) confirmed the significant impact of effective use of classroom management strategies on student engagement and student achievement. In this study, classes with effective classroom management had significantly higher engagement rates (+.61 effect size) and achievement levels (+.54 effect size) than classes without successful management.

**Explicit Instruction** is integrated into Boundless Learning to support all students, including those with special needs—English Language Learners, students with disabilities, and those with

other individual learning needs. A meta-analysis (Adams & Engleman, 1996) found that the mean effect size for teachers using explicit instruction is more than +.75, confirming the overall effect of these practices as substantial. Explicit instruction incorporates: a) well-defined, segmented instruction with modeling and demonstrations; b) guided practice with timely, corrective feedback; and c) measured removal of support by the teacher to promote student independent performance (Archer & Hughes 2011). In addition to these components, Boundless Learning uses an instructional/assessment cycle that addresses **Universal Design for Learning (UDL)**, focusing on students’ learning needs during planning and design, delivery and management, and evaluation/assessment. Moreover, it utilizes a consistent, six-stage, daily cycle of instruction—the **Team-Based Cycle of Instruction (TBCI)**—that combines explicit instruction along with protocols developed for activating prior knowledge, structuring team learning, working independently, assessing understanding, giving corrective feedback, processing performance, and transitioning to activities.



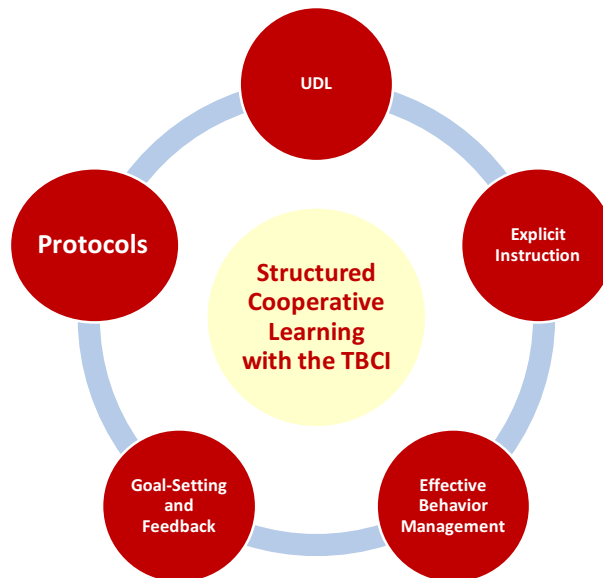
©Team-Based Cycle of Instruction, JHU/CTE

**Protocols**, known as **procedural facilitators (PFs)**, which are checklists, questions, prompts, or simple outlines of essential structures, are used routinely to promote productive teamwork, learning, and achievement (Mainzer, 1999; 2011). They are used as aides that provide a common language and help students follow procedures that replicate the performance of more efficient learners (Scardamalia & Bereiter, 1986). Studies also indicate their usefulness as key strategies for improving skills in reading comprehension and expressive writing (Baker, Gersten, Scanlon, 2002; Scardamalia & Bereiter, 1986). In essence, they provide a “plan of action” for task completion along with procedures for feedback (Baker, Gersten, Scanlon, 2002). These PFs assist students with organization and structuring how they will perform tasks (Kolligian & Steinberg, 1987).

The step-by-step PFs or protocols guide learners through the teambuilding process as well as each stage of the TBCI. Their purpose is to highly structure cooperative and independent lessons and activities so that of student-to-student and teacher-to-student interactions reach higher levels of performance. Their use facilitates student engagement, discussion, understanding of content, goal attainment, progress monitoring, and application teaming skills.

Taken together, these evidence-based instructional processes, which are used in Boundless Learning, have produced positive outcomes for students with disabilities, across content areas and grade levels.

### Research Areas Supporting Boundless Learning



### Impact of Boundless Learning Initiatives

#### • **Co-Teaching**

Elementary:

- Students with disabilities in segregated settings were successfully included in their neighborhood school in co-taught inclusive settings. Returning students had substantially lower absentee rates, most all students met IEP goals (Reading—80%, Math—81%, and Behavior—100%), and all students were promoted to the next grade.
- Approximately, 1000 second and third grade students received instruction in general education co-taught classes. Attendance and suspension rates improved from Year 1 to Year 2. Third graders in a co-taught class who participated in the program for two years in a row scored 97% in math and 96% in reading state assessment tests.

High School:

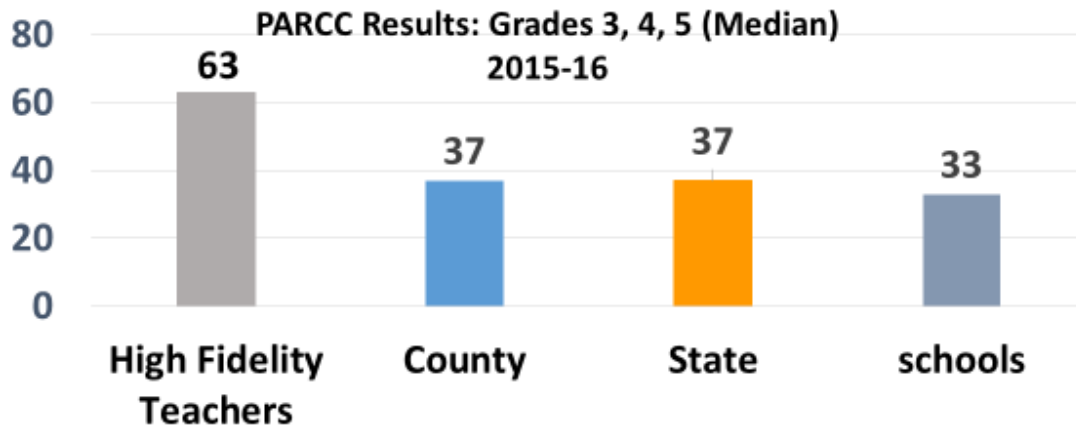
- More than 300 students with disabilities in co-taught classes using structured cooperative learning met or exceeded standards on English and Math state assessments.

#### • **Inclusion (MD State Personnel Development Grant 2012-17)**

The following charts illustrate positive results for students participating in the Boundless Learning classes where teachers maintained fidelity to its instructional processes. Elementary students with disabilities, English Language Learners, and students receiving Title 1 services demonstrated improved academic achievement in mathematics when teachers implemented the program with fidelity.

Number of Students Passing State Assessment Scores

### State Math Assessment Passing Rate: *Teacher Performance Level, Schools, County, State*

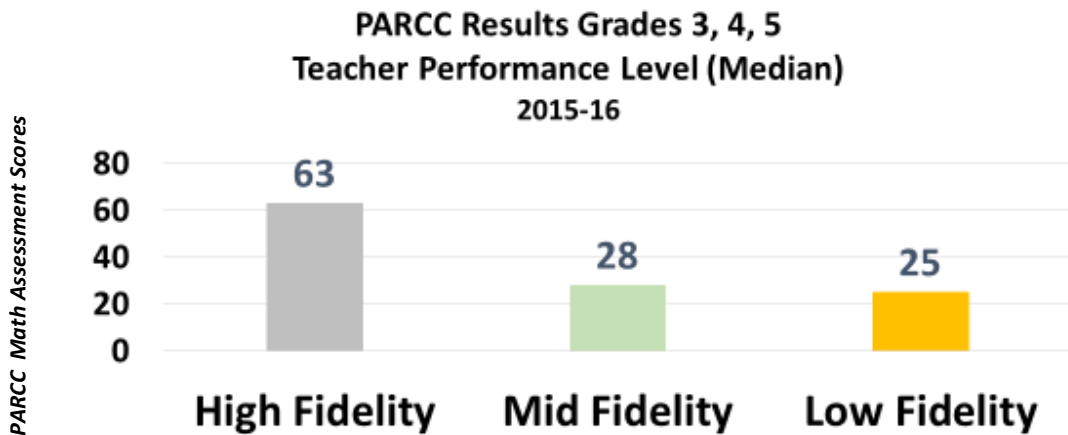


n=7 Teachers

High Fidelity Teachers in Comparison to County, State, Schools

District A

### Passing Rate State Math Assessments: *Comparison of Teacher Performance Levels*



n=22 Teachers

Teacher Performance Level

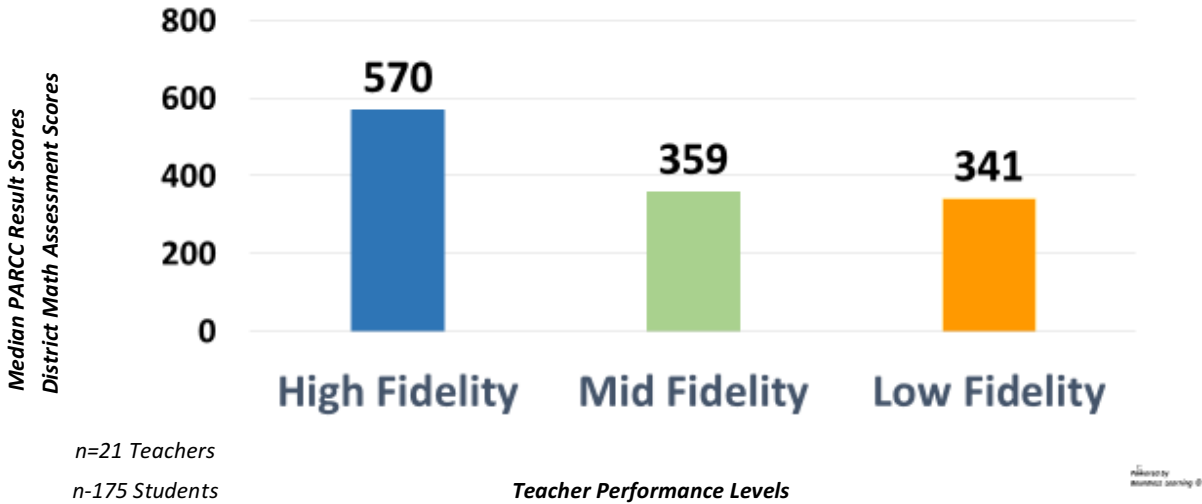
District A

# District Math Assessment Scores

Comparison Teacher Performance Level

Grades 2-5 (Average)

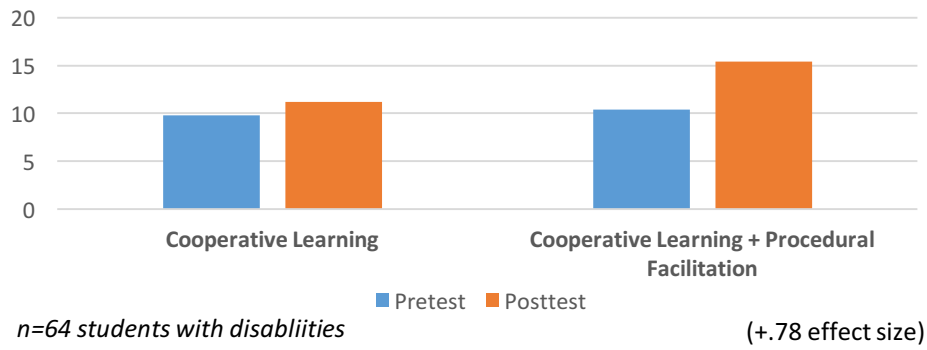
2015-16



- **Structured Cooperative Learning with Protocols**

In this experimental study, classes were randomly assigned to implement conventional cooperative learning or structured cooperative learning (cooperative learning with procedural facilitation). The participants included sixty-four students with disabilities in grades 4, 5, and 6 and seven teachers (2-middle school teachers and 5-elementary schools participated). Findings demonstrated that when cooperative learning was structured with procedural facilitators, students with mild disabilities in general education settings significantly outperformed students in conventional cooperative learning classes on math district mathematics achievement tests. The effect size was  $+0.78$ , which is a substantially large.

**Group Means of Math Achievement Scores among Students with Disabilities in Cooperative Learning + Structured Cooperative Learning and Conventional Cooperative Learning (1999)**



## References

- Adams, G. L. & Engelmann, S. (1996). *Research in Direct Instruction: 25 Years Beyond DISTAR*. Seattle, WA: Educational Achievement Systems.
- Archer, A., & Hughes, C. (2011). *Explicit Instruction: Effective and Efficient Teaching*. NY: Guilford Publications.
- Baker, S., Gersten, R., & Scanlon, D. (2002). Procedural Facilitators and Cognitive Strategies: Tools for Unraveling the Mysteries of Comprehension and the Writing Process, and for Providing Meaningful Access to the General Curriculum. *Learning Disabilities Research and Practice, 17*, 65-77.
- Johnson, D.W., & Johnson, R.T. (1998). Learning together and alone: Cooperative, competitive, and individualistic learning (5th ed.). Boston: Allyn & Bacon.
- Mainzer, K.L. (2011). Boundless Learning Co-Teaching. Exceptional Innovations, Inc.: Reston, VA.
- Marzano, R. J. (2017). <http://www.marzanoresearch.com/research/database>
- Marzano, R. J., Marzano, J., & Pickering, D. (2003). *Classroom Management That Works*. Alexandria, Va: ASCD.
- Scardamalia, M. & Bereiter, C. (1986). Written composition. In M. Wittrock (Ed.), *Handbook on research on teaching* (3<sup>rd</sup> ed., pp. 779-803). New York: Macmillan.
- Slavin, R. E. & Lake, C. (2007, February). Effective programs in elementary mathematics: A best-evidence synthesis. Baltimore, MD: Johns Hopkins University, Center for Data-Driven Reform in Education.
- Slavin, R.E. & Lake, C. (2008, September). Effective programs in elementary mathematics: A best-evidence synthesis. *Review of Educational Research, 78*, 3, 427-515.
- Slavin, R.E, Madden, N.A., & Leavey, M. (1984). Effects of cooperative learning and individualized instruction on mainstreamed students. *Exceptional Children, 50* (5), 434-443.