WHEN IT STILL DOESN'T MAKE SENSE...

THE NEED IS GREAT

FACT 01 Special education teachers report a lack of materials, a lack of support, and a lack of confidence in teaching mathematics. *(Cole & Wasburn-Moses, 2010)*

FACT 02 The mathematics achievement gap for struggling students is well-documented.

Achievement gap for students from the Waterloo Community School District, 2015

Grade Level	% Proficient Non-IEP	% Proficient IEP	Gap
3	59.96	29.73	30.23
4	64	36.28	27.72
5	69.44	34.55	34.89

THE RESEARCH EXISTS

Teaching Mathematics to Struggling Learners (TMSL) focuses on the Institute for Education Sciences (IES) Guide Recommendations:

- Implement systematic, explicit instruction
- Build fluency of basic facts
- Focus intervention materials on whole number and operations
- Provide motivation strategies for interventions

Assisting Students Struggling with Mathematics: Response to Intervention (RtI) for Elementary and Middle Schools (2009)

TEACHING MATHEMATICS TO STRUGGLING LEARNERS

CONNECTING RESEARCH TO THE CLASSROOM IS BOTH POWERFUL AND CHALLENGING

TMSL provides support to special education teachers and coaches:

- **Teachers use Cognition-Based Assessments to guide interventions.** (Michael Battista)
- **Teachers experience models of, and implement explicit and systematic instruction within, mathematics.** (IES Guide Recommendations)
- **Teachers develop an understanding of the need for fluency and a means by which to balance fluency with all of the other aspects of mathematics.** (IES Guide Recommendations)
- **Teachers shift their mindset from a fixed to a growth mindset and support their students in doing the same.** (Carol Dweck, Jo Boaler)

CHALLENGES

Teachers need research-based progress monitoring assessment tools aligned to the intervention.

Teachers need consistent instructional time for the intervention to occur.

Teachers need ongoing support and collaboration from colleagues and administrators.

CHANGES WE'VE SEEN

QUESTIONS AND EVALUATION RESULTS

Do the teachers confidently implement the program?

YES. Fall 2016 Levels of Use interviews found that **all sixteen members** of the treatment group were at least at the Routine level of use with 56.25% at the Refined level and 31.25% at the Integration level. The Refined and Integration level users are able to vary the program to have an impact on students. Further, the Integration level user is able to work with others to achieve a collective effect on students.

Did teachers confidently implement the diagnostic assessment?

YES. Fall 2016 Levels of Use interviews found that 56.25% of the treatment group was at the Routine level, and 43.75% of the treatment group was at the Refined level. The Routine level teacher is comfortable with administering the diagnostic assessment in accordance to the directions of administration.

Did teachers increase their belief in the effect of good teaching on student outcomes?

YES. There was a statistical difference on the Outcomes Expectancy scale at the .01 level of statistical significance in favor of the treatment group. There were ten teachers in each base equivalent group. Grant participants felt that good teaching does have a positive effect on student outcomes. The Partial Eta Squared for the Outcome Expectancy scale was equal to .308 and considered a large effect size.

Do teachers feel that they are becoming effective teachers of mathematics?

YES. There was a statistical difference on the Self-Efficacy scale at the .08 level of statistical significance in favor of the treatment group. There were ten teachers in each base equivalent group. Grant participants felt more confident in teaching mathematics. The Partial Eta Squared for the Self-Efficacy scale was equal to .164 and considered approaching a large effect size.

Did teachers increase their mathematical content knowledge?

YES. There is a statistically significant difference between groups at the .05 level of probability in favor of the treatment group on the LMT rational numbers assessment. There were 11 control group teachers and 12 treatment group teachers. The Partial Eta Squared for the LMT rational numbers assessment was equal to .17 and considered approaching a large effect size.

Did the course meet the needs of the teacher participants?

YES. The members' responses were very positive. 100% of the treatment group agreed that the courses either met or partially met their professional growth goals. Face-to-face sessions were most valued, and online discussion was least valued.

CHRISTINA CURRAN, PhD christina.curran@uni.edu • VICKI OLESON, EdD vicki.oleson@uni.edu • CONNIE TERRY, MA cterry@ghaea.org