

TEACHER **as** RESEARCHER

BRIEF: Empowering Teachers as Researchers in South Carolina

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BRIEF: Empowering Teachers as Researchers in South Carolina

Marzano Research's *Teacher as Researcher* provides tools, coaching, and research design workshops for teachers to select evidence-based instructional strategies, design authentic experiments to implement the strategies, collect data, analyze these data, and ultimately reflect and act on the results of their experiments, all within a structured, easy to implement Instructional Improvement Cycle. Ultimately, teacher reflection within the workshops leads to ongoing improvement in classroom practices.

This brief highlights key findings from an evaluation of *Teacher as Researcher* implemented in South Carolina. These key findings show that *Teacher as Researcher* contributes to teachers' use of evidence-based practices, knowledge about instructional improvement, and teachers' efficacy and agency. Refer to Box 1 for an overview of the evaluation design.

BOX 1. Evaluation Design

The evaluation is a pretest-posttest design focused on teacher outcomes, and the program is based on a well-defined logic model and rigorous research. Participants included the Spring 2022 Pilot (17 teachers in 10 schools in 4 districts) and 2022-23 Cohort 1 (174 teachers in 32 schools in 18 districts). An independent team at Marzano Research conducted the research. Data sources included the *Pre/Post Knowledge, Efficacy, and Agency Survey*, *Exit Surveys*, and documents related to teachers' instructional improvement work.

1. Grounding in Evidence

The research is clear: teachers have the strongest effect on student achievement compared to other school factors (Sanders et al., 1998; Opper, 2019). How can teachers ensure that their effect is positive?

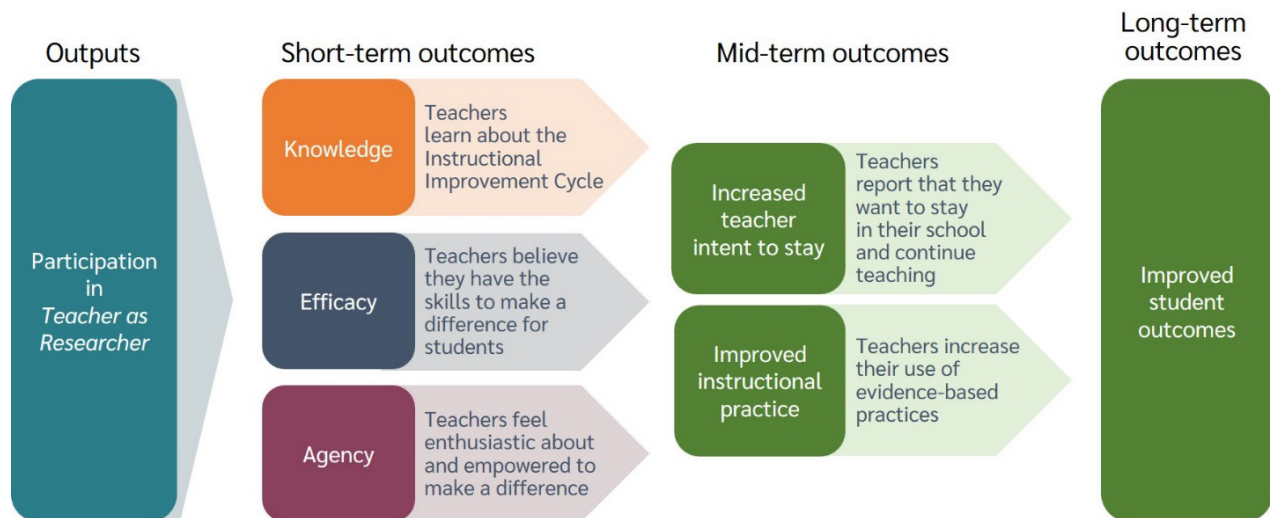
Beginning with the work of Kurt Lewin in the 1940s, teachers have borrowed methods from social science research to identify and solve practical education problems (Masters, 1995). This type of teacher research in classrooms has a long tradition and is often called "action research" (Manfra, 2019). It has promise.

But, action research fails when teachers use haphazard methods and do not ground their instruction in evidence-based strategies (Newton et al., 2016). In addition, despite the annual and interim testing typical in schools over the last two decades, many articles documented the importance of building teacher capacity by using formative data to improve classroom instruction (Means et al., 2011; Schildkamp et al., 2020).

Marzano Research's *Teacher as Researcher*¹ uses tried-and-true experimental research methods that rapidly provide accurate information about instruction (Marzano et al., 2020; Cherasaro et al., 2015). With its focus on evidence-based instruction, immediate feedback about students, and teacher reflection, *Teacher as Researcher* has the hallmarks of professional learning with "staying power," the ability to be implemented and sustained by teachers and the power to make a difference for students in the long term (Guskey, 2021).

Ultimately, South Carolina leaders expect that *if* Marzano Research offers evidence-based strategies, provides tools and coaching, and delivers research design workshops to educators, *then* participation in *Teacher as Researcher* will be associated with increases in teachers' knowledge, efficacy, and agency, *which will lead to* teachers' changes in practice and intentions to stay in the teaching profession, and *which will ultimately help* increase student achievement (Figure 1).

Figure 1. Intended Outcomes of *Teacher as Researcher* in South Carolina



Source: Created by the Marzano Research evaluation team.

2. Supports for Teachers' Use of Evidence-Based Strategies

Teacher as Researcher developers at Marzano Research identified evidence-based strategies from the existing Institute for Education Sciences What Works Clearinghouse (WWC) Practice Guides in mathematics and English language arts (ELA). Figure 2 shows an example of a recommendation summary.

- 65 evidence-based **mathematics strategies** aligned to South Carolina standards
- 89 evidence-based **literacy strategies** aligned to South Carolina standards

Currently, the team is working on additional cross-content instructional strategies that work in multiple subject areas.

¹ Marzano Research's *Teacher as Researcher* is a trademarked professional learning program for teachers; however, other publications have used the phrase "teacher as researcher" in a general sense.

Marzano Research experts created a summary for each recommendation that:

- describes the recommendation;
- includes the reported levels of evidence, i.e., the amount and quality of the research evidence that supports the recommendation;
- highlights examples of the instructional strategies related to that recommendation; and
- shows how each strategy is aligned with South Carolina Mathematics/ELA and Teacher Standards.

Figure 2. Recommendation Summary Example

WWC Practice Guide <i>Recommendation</i>	Level of	Instructional Strategy (Strategy code)	SC Standards Alignment	
			Mathematics	Teacher
Improving Mathematical Problem Solving in Grades 4 Through 8				
Recommendation 1: Prepare problems and use them in whole class instruction	Minimal	Include both routine and non-routine problems in problem-solving activities. (PR.1.1)	PS.1c	INST.MS.1, INST.AM.4, INST.TCK.2, PLAN.SW.1
		Ensure that students will understand the problem by addressing issues students might encounter with the problem's context or language. (PR.1.2)	PS.2d	INST.PIC.2, INST.TCK.2, PLAN.Desc.1
		Consider students' knowledge of mathematical content when planning lessons. (PR.1.3)	PS.1a	INST.AM.6, PLAN. SW.3, PLAN.Desc.1

Source: *Teacher as Researcher* team consolidation of IES' practice guide: *Improving Mathematical Problem Solving in Grades 4 Through 8*.

Most importantly, for each strategy, Marzano Research developers have included examples of how to carry about the strategy effectively (Box 2). Teachers select from among these strategies based on their classroom needs. The teachers then conduct Instructional Improvement Cycles that test the strategy with some of their students, gather data about student outcomes, and calculate the effect of the strategy as implemented by the teacher using rigorous scientific methods. Teachers reflect on this process and determine the next steps for improving instruction.

Box 2. Recommendation Implementation

HOW TO CARRY OUT THE RECOMMENDATION

1. Include both routine and nonroutine problems in problem-solving activities.

Instructional strategies from the examples

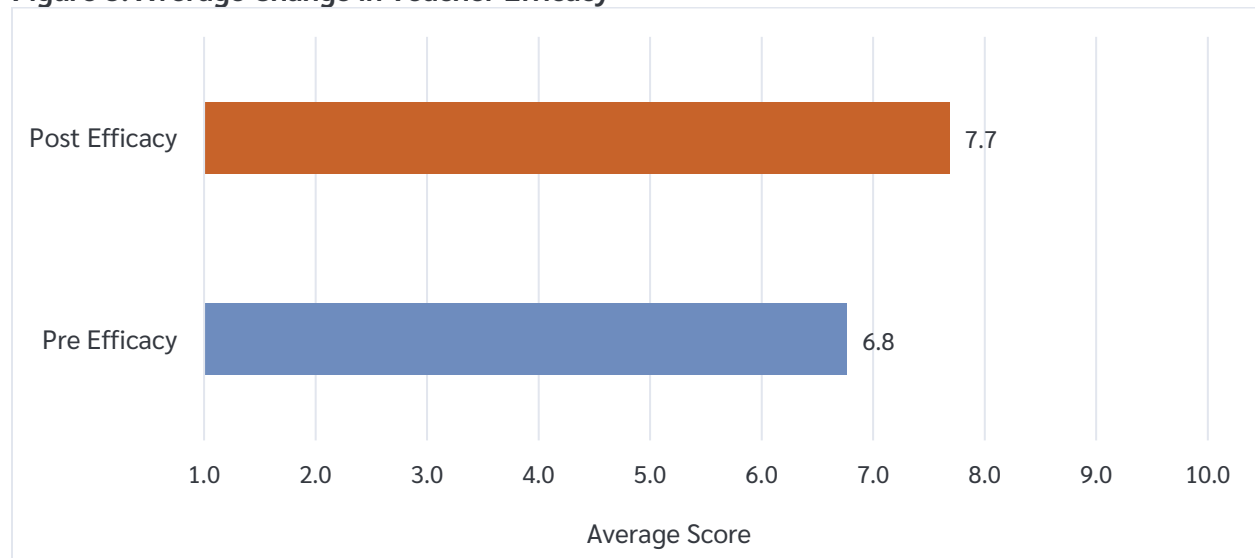
- Align use of routine or nonroutine problems with students' previous experience with problem solving.
- Routine problems can be solved using familiar methods, replicating previously learned methods in a step-by-step fashion

3. Increases in Teacher Efficacy

The 2022-23 evaluation shows that teachers participating in *Teacher as Researcher* increased their sense of "efficacy," i.e., confidence in their instructional abilities. Other research has shown that teacher efficacy is highly correlated with positive results for students (Cantrell et al., 2013; Kim et al., 2018; Tschannen-Moran et al., 2004).

Cohort 1 teacher *Pre/Post Knowledge, Efficacy, and Agency Survey* responses indicated a statistically significant increase in their efficacy. The *Teachers' Sense of Efficacy Survey* created by Tschannen-Moran and Woolfolk Hoy has shown typical scores of 6.7 to 7.5 on a 10-point scale (Page et al., 2014). The evaluation of *Teacher as Researcher* in South Carolina found that pre-survey efficacy levels were relatively low (6.8) but rose to 7.7 on the post-survey (Figure 3). While there may be other contributing factors, this change in efficacy was statistically significant, which means that it was unlikely to have occurred by chance.

Figure 3. Average Change in Teacher Efficacy



Note. Effect size of $g = 0.88$.

Source: Author's analysis of *Pre/Post Knowledge, Efficacy, and Agency Survey* data.

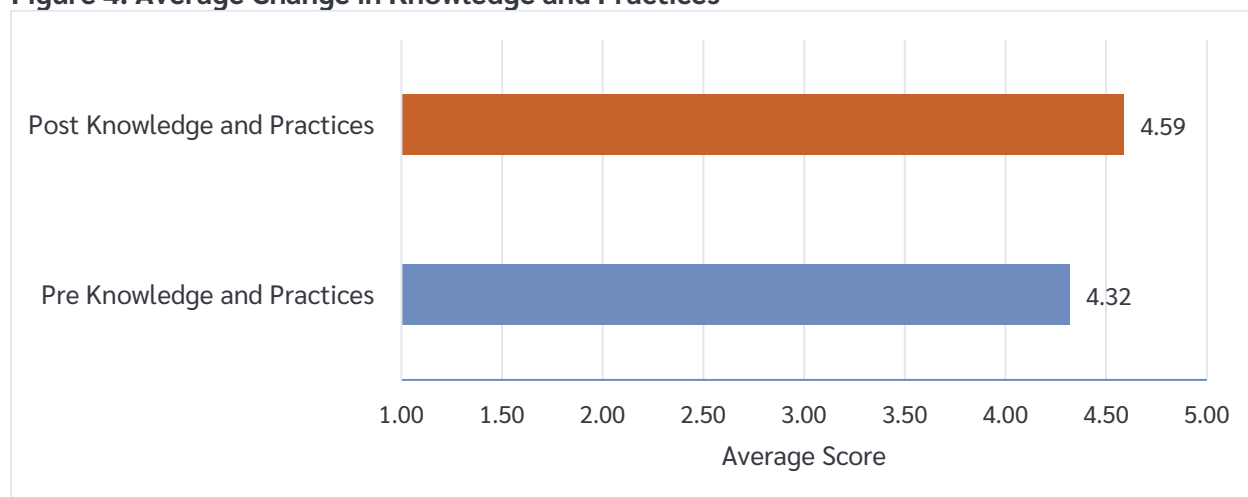
4. Increases in Teacher Knowledge and Use of Instructional Improvement Cycles

The 2022-23 evaluation shows that participating teachers increased their knowledge and use of the Instructional Improvement Cycle taught during *Teacher as Researcher*. Other research has shown that effective teacher data use is associated with increases in student achievement (Lee et al., 2020; Klute et al., 2017).

The evaluation team developed questions using the stated objectives of the *Teacher as Researcher* research design workshops. These questions measure four themes—reflective practice, knowledge about testing and evaluating instructional strategies, knowledge about selecting appropriate instructional strategies, and collaborative classroom practices. Participants rated their responses from "I don't understand this" to "I understand this, and I use it often in my teaching."

Cohort 1 teacher *Pre/Post Knowledge, Efficacy, and Agency Survey* responses indicated a statistically significant increase in knowledge and use of the Instructional Improvement Cycle (Figure 4).

Figure 4. Average Change in Knowledge and Practices



Note. Effect size of $d = .71$.

Source: Author's analysis of *Pre/Post Knowledge, Efficacy, and Agency Survey* data.

5. Endorsement from South Carolina Teachers

Teacher experiences in, and satisfaction with, professional development has long been associated with changes in beliefs which lead to changes in practices (e.g., Guskey, 2002). The research design workshops in *Teacher as Researcher* aim to provide teachers with positive experiences that lead to positive changes in practices, and Marzano Research coaches pride themselves on delivering workshops that are high-quality and appreciated by educators.

All Pilot session participants, and more than 85% of Cohort 1 session participants, agreed or strongly agreed with positive statements related to the research design workshops.

In their comments about what was useful about *Teacher as Researcher* in the first four sessions, teachers most frequently said they increased their knowledge of research and its use in classrooms:

"I learned the basics of action research: how to implement the Instructional Improvement Cycle. I also became familiar with the strategy workshop web application."

"[I learned] how to utilize the pre-assessment, mid-assessment, and post-assessment properly and how to select a strategy."

After completing Instructional Improvement Cycles in sessions 5 and 6, teachers most frequently commented that they appreciated reflecting on their work with their colleagues:

"I was able to interpret my results and reflect on what led to them, and was able to begin thinking about future applications of an instructional strategy."

"I learned how everyone's strategies went and takeaways that could apply to our grade level."

"It was helpful having an opportunity to discuss the implemented strategy and figure out ways of improving it for the next cycle."

6. Find out how to participate in *Teacher as Researcher*

No matter what your role is in education—teacher, principal, central office, superintendent, university educator, or state leader—you can connect with *Teacher as Researcher*. Find out more about *Teacher as Researcher* on the [Marzano Research website](#), sign up for our [newsletter](#), or contact Marzano Research Director Trudy Cherasaro at Trudy.Cherasaro@marzanoresearch.com or 720.463.3600 x 114.

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