Knowledge Acquisition and Transformation Expansion (KATE) Results from Grade 5 Scale-Up Study

What are the key ingredients of KATE?

The Knowledge Acquisition and Transformation (KAT) Framework is a 360-degree approach to improving reading comprehension in all grade levels and adults. The 360-degree supports include:

1. Elevate Teaching – Teacher practice-based professional development (PBPD).
2. Empower Student Comprehension – Teacher-led daily instruction on vocabulary, generating main ideas, summaries, and inferences by leveraging higher-order text structures (i.e., cause and effect, problem and solution, cause-problem-solution, comparison) for all genres of text in all domains (e.g., English language arts - ELA, science, social studies).
3. Expand Comprehension – Anchor all ELA skills on the foundations of main ideas and summaries (e.g., author's purpose, theme, character traits, figurative language).
4. Utilize School-Based Resources – Apply KAT with all textbook passages, chapter books, novels, poetry, and trade books.
5. Individualize Instruction – Leverage Artificial Intelligence (AI) software for students using the intelligent tutoring system for the structure strategy (ITSS) featured in the What Works Clearinghouse.
6. Coach and Model – Support teacher fidelity of instruction.
7. Sustain Success – Establish professional learning communities and instructional leadership.

What was the KATE study design?

KATE was an expansion-phase Educational Innovation and Research (EIR) study funded by the US Department of Education (S411A210002) and awarded to Texas A&M University Research Foundation, with external evaluators WestEd and Analytica Insights Inc. The research used 48 schools across five states, randomly assigned to use KATE or a business-as-usual control group. Standardized and researcher-designed measures were administered at pre- and post-test.

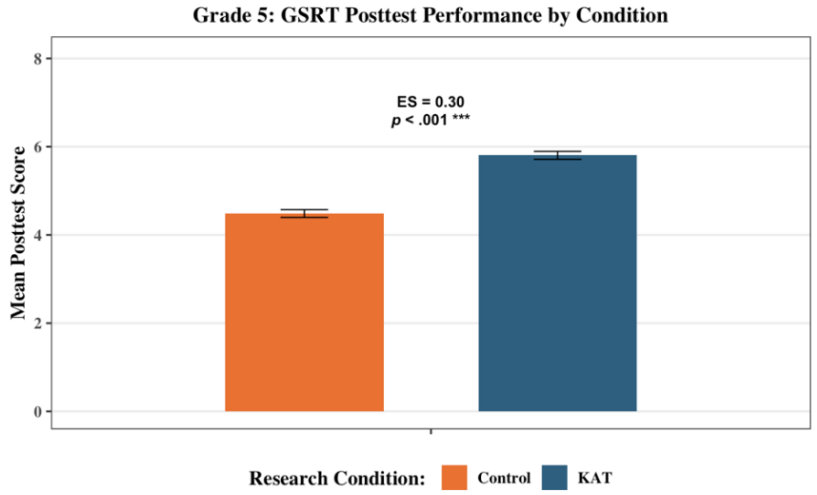
Our Research:



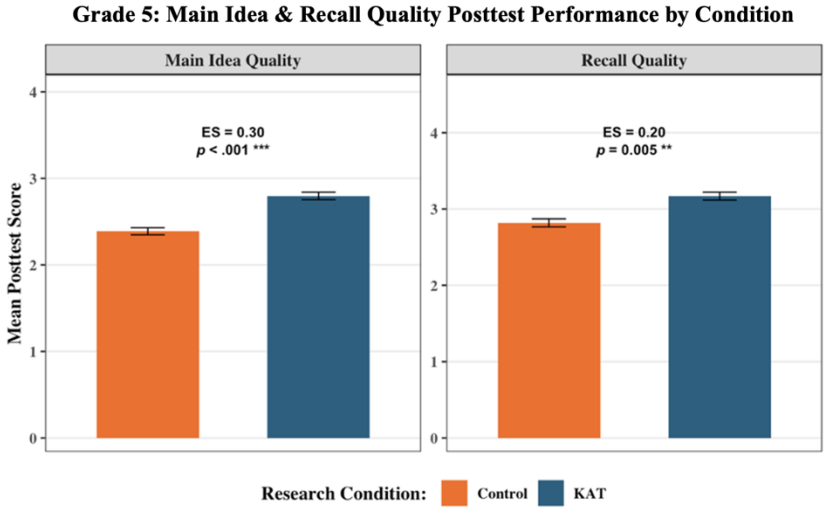
For more information, please contact Dr. Kay Wijekumar at K_Wijekumar@tamu.edu.

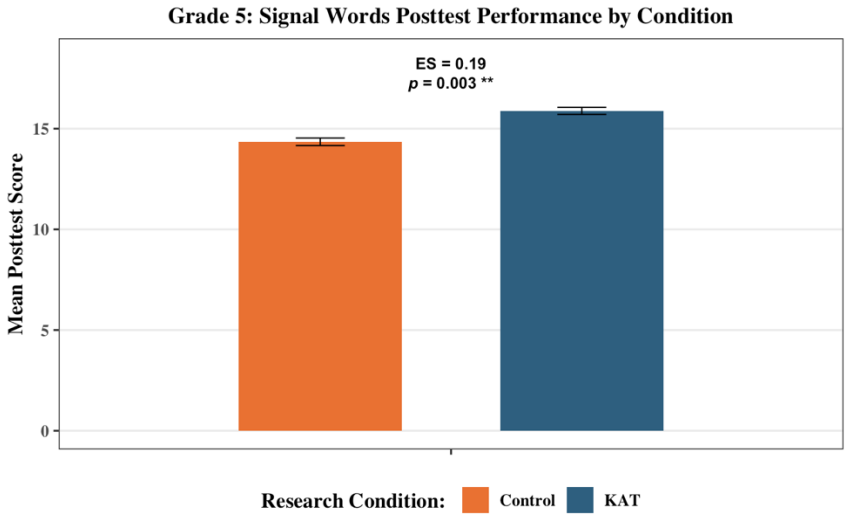
What were the key student-related findings?

- **Major Finding 1:** Across the 2023-2024 and 2024-2025 school years, a total of 3,691 fifth-grade students from 48 schools, 103 teachers, and eight districts participated in the study. Of these students, 1,731 from 24 schools and 60 teachers were assigned to the control group, while 1,960 from 24 schools and 43 teachers were assigned to the KATE treatment group. As shown in the figure below, students in the KATE treatment group significantly outperformed their control-group counterparts on the standardized Gray Silent Reading Test (GSRT). The covariate-adjusted effect size, controlling for gender and pretest scores, was 0.30 ($p < .001$), indicating a small-to-moderate effect.

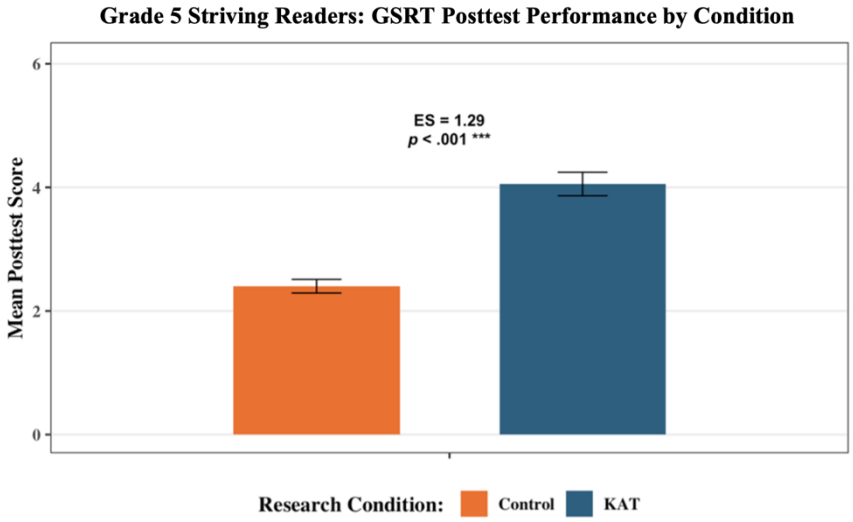


- **Major Finding 2:** Fifth-grade students who received KATE-aligned instruction significantly outperformed their control-group counterparts on main idea quality, recall quality, and signaling words knowledge. The covariate-adjusted effect size was 0.30 ($p < .001$), indicating a small-to-moderate positive effect on students' ability to generate high-quality main idea statements. The effects on recall quality (ES=0.20) and signaling words (ES=0.19) were small but statistically significant ($ps < .01$).





- **Major Finding 3:** Fifth-grade striving readers (i.e., students scoring below the 25th percentile on a composite of pretest z scores across the six measures including GSRT, main idea quality etc.) demonstrated the greatest improvement. The subgroup included 365 students taught by 39 teachers across 24 schools in the treatment group and 395 students taught by 55 teachers across 24 schools in the control group. For example, on the standardized GSRT, the treatment group substantially outperformed the control group, with a large effect size (ES = 1.29, $p < .001$).



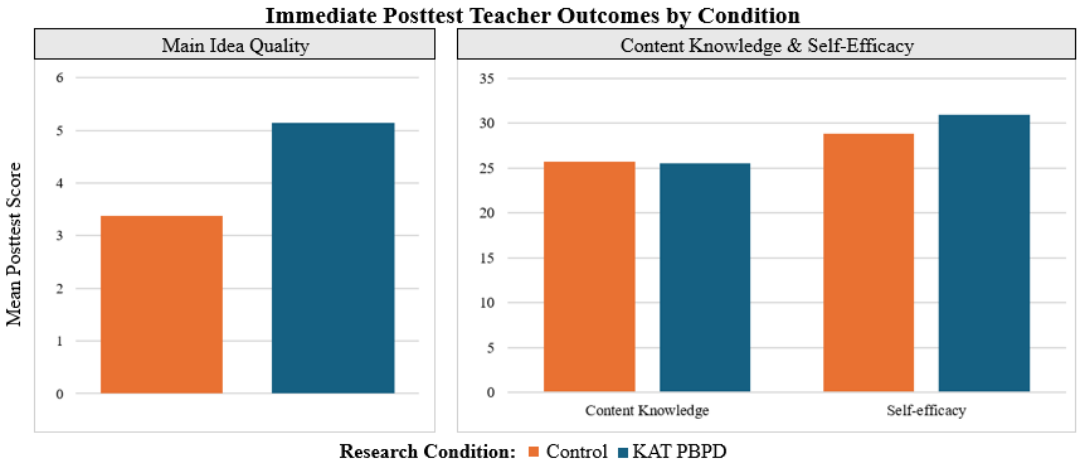
Source:

Zhang, S., Wijekumar, K. K., Lei, P., Stack, A., Lambright, K., Rice, M., and Turner, H. W. III (in press). Improving reading comprehension in fifth-grade students: A scale-up randomized controlled study of the Knowledge Acquisition and Transformation Framework. *Journal of Educational Psychology*.

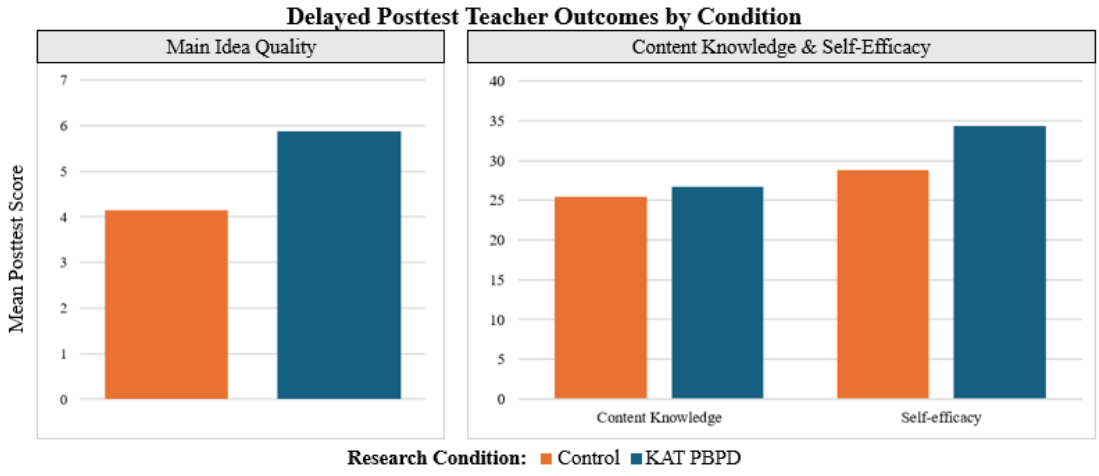
Zhang, S., Wijekumar, K. K., Stack, A., Lambright, K., & Cantrell, E. (Under Review). Effects of the Knowledge Acquisition and Transformation Framework on reading comprehension: A scale-up study with striving readers. Paper currently under review in *Educational Technology Research and Development*.

What were the key teacher-related findings?

- **Major Finding 1:** After teachers received the KATE PBPD, the KATE group teachers outperformed control group teachers on measures of main idea quality with a large effect size (ES = 1.05, $p < .001$) and self-efficacy for teaching reading (ES = 0.36, $p = .001$).



- **Major Finding 2:** Changes to teacher knowledge were sustained over a full academic year of KATE implementation, with teachers receiving the KATE PBPD outperforming control group teachers on measures of main idea quality (ES = 0.97, $p < .001$), content knowledge (ES = 0.37, $p = .007$), and self-efficacy (ES = 0.41, $p < .001$) at end-of-year delayed post-test.



Source:

Rice, M., Wijekumar, K. (Kay), Stack, A., & Lambright, K. (2025). Sustaining teacher knowledge and self-perception of reading comprehension instruction: A year-long study of practice-based professional development. *Contemporary Educational Psychology*, *82*. https://doi.org/10.1016/j.cedpsych.2025.102391

Stack, A. M., Wijekumar, K., Rice, M., McKeown, D., Gerde, H., Luo, W., & Lei, P.-W. (2026). Evidence of the effects of a practice-based reading comprehension professional development on teachers' knowledge of reading comprehension. *Journal of Educational Psychology*, 118(6), 910–929. https://doi.org/10.1037/edu0001018