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EGRA and EGMA
Deep Dive Analysis
January 25, 2024

UZBEKISTAN
EDUCATION
for
EXCELLENCE
PROGRAM



MISSISSIPPI STATE
UNIVERSITY

Uzbekistan Education for Excellence Program

Inclusive Education Study Findings Report
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ABBREVIATIONS

cwpm	correct words per minute
EGMA	Early Grade Mathematics Assessment
EGRA	Early Grade Reading Assessment
M&E	monitoring and evaluation
MoPSE	Ministry of Preschool and School Education
ORF	oral reading fluency
RTI	RTI International
TPD	teacher professional development
ULA	Uzbek Language Arts
USAID	United States Agency for International Development

INTRODUCTION

This report presents the findings of a deep dive impact evaluation of the United States Agency for International Development (USAID) Uzbekistan Education for Excellence Program (The Program), which was initiated on December 9, 2019, and originally scheduled to end on December 8, 2023, then extended through March 31, 2024. The Program is implemented by a consortium of partners including RTI International (RTI) as the consortium lead and Florida State University and Mississippi State University as partners. For this report, the Program used a comparative analysis of Early Grade Reading and Mathematics Assessments (EGRA and EGMA, respectively) administered at baseline in 2021 and at endline in 2023.

The Program evaluation focused on students in grades 2 and 4. In November and December of the 2021-22 school year, the baseline EGRA and EGMA were administered to students who completed grades 2 and 4 and had been in grades 3 and 5 for three months. The endline assessments were administered to students in grades 2 and 4 in May of 2023, a few weeks prior to the end of that school year. This meant that students at endline were being assessed after having completed 68 fewer days of schooling than those who were assessed at baseline.

After accounting for these differences in the numbers of days of schooling, before the students were assessed, and adjusting the baseline scores accordingly,¹ the impact evaluation of the Program showed that on average in Program schools from baseline to endline:

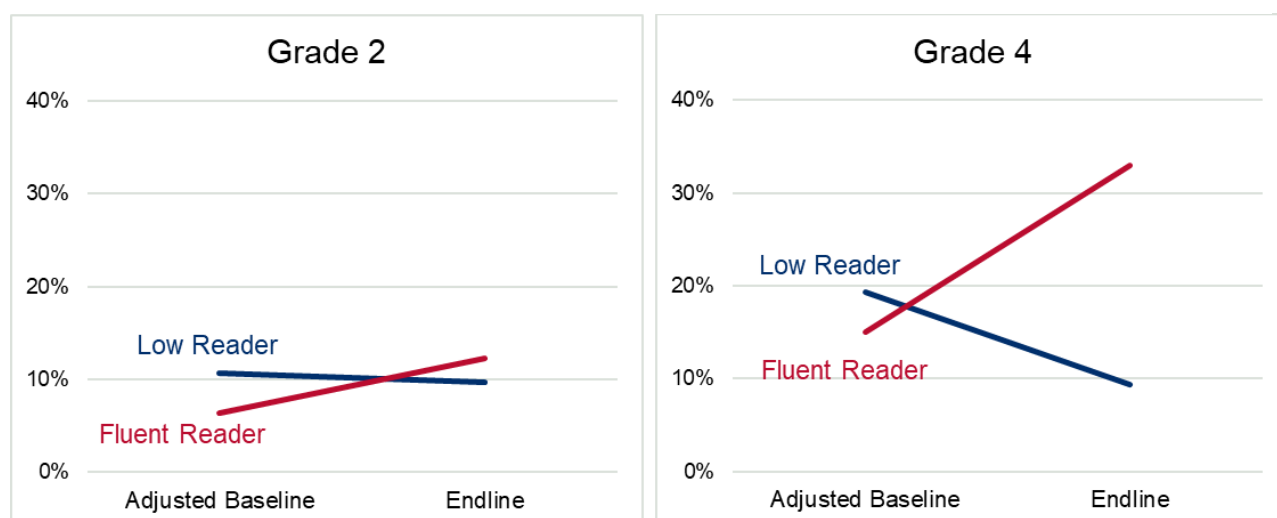
- Grade 2 students scored only slightly better in reading comprehension.
- Grade 4 students saw significant improvement in oral reading fluency (ORF).

Benchmarks for reading proficiency were set according to the number of correct words per minute (cwpm) students could read, which varied for each grade, and according to the students' score in reading comprehension.² With respect to student performance in relation to standards for reading proficiency, on average a greater share of students in the Program schools at endline than at baseline were in the “fluent reader” category, and a lower percentage were in the “low reader” category, with especially large increases among the “fluent readers” in grade 4, as seen in **Figure 1** below.

¹ Annex A of the Early Grade Reading and Mathematics Endline Impact Evaluation Report, 2023 explains the methodology for adjusting the baseline EGRA and EGMA scores to account for the difference in the number of days of schooling. This report is available at: <https://shared.rti.org/content/uzbekistan-education-excellence-program-ueep-early-grade-reading-and-mathematics-endline>

² Benchmarks for reading proficiency are presented in the Early Grade Reading and Mathematics Endline Impact Evaluation Report, 2023 on p. 11 for grade 2 and on p. 13 for grade 4. Grade 2 fluent reading means an ORF score greater than 60 correct words per minute and a comprehension score above 80%. A grade 4 fluent reader had an ORF score of 70 correct words or more per minute and a comprehension score of 80%.

Figure 1. Comparison of the Percentages of Students in the Low and Fluent Categories of Reading Proficiency at Endline and Baseline



For math,

- Grade 2 students showed improvement in pattern recognition, assessed by identifying missing numbers in a sequence. There was little change in their results on other assessment tasks, but a slight decline in their performance in basic operations such as subtraction.
- Grade 4 students' overall math scores improved slightly, with the biggest increase at endline seen in their performance on the numbers and operations tasks.

The Program's impact evaluation design originally included a comparison of the Program schools in the Namangan and Sirdaryo Regions to a control set of schools in Jizzakh Region that did not receive Program support. However, at endline concerns were raised regarding how the assessments were administered in Jizzakh, leading the Program team to discard the control school results.³

The purpose of this additional analysis of the Program's endline data is to determine whether the variation in learning outcomes among Program schools is in any way related to how those schools received and made use of the Program inputs and support.

This report summarizes those additional analyses.

³ Fuller discussion of the concerns with the baseline administration in control schools is included in the Early Grade Reading and Mathematics Endline Impact Evaluation Report, 2023 on p. 7-8. Available at: <https://shared.rti.org/content/uzbekistan-education-excellence-program-ueep-early-grade-reading-and-mathematics-endline>

RESEARCH DESIGN

Fundamentally, the additional analyses presented here assess how the implementation of the Program contributed to improvements in teaching and learning in Program schools. The Program team assembled data from the Program’s monitoring and evaluation (M&E) systems to determine how Program inputs were made available in each school in the endline sample. We provide an overview of the Program inputs here.

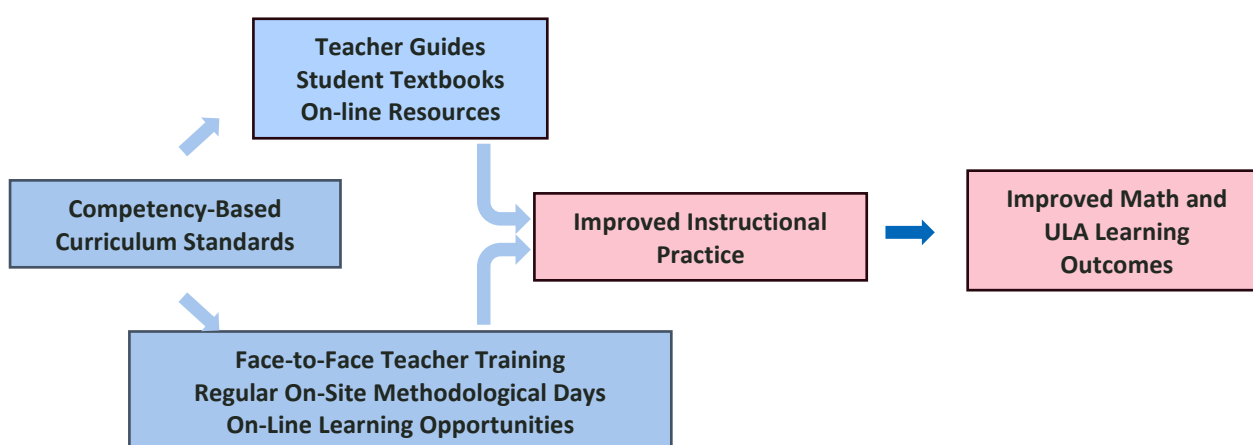
In close collaboration with the Ministry of Preschool and School Education (MoPSE), the Program supported the following contributions to improving the teaching and learning of Uzbek Language Arts (ULA) and Mathematics in the Program schools:

- Developed relevant and appropriate student learning standards for ULA and Mathematics for grades 1–4.
- Developed and piloted revised student textbooks and teacher guides for ULA and Mathematics, one each per grade, for grades 1 through 4.
- Designed and implemented an in-service teacher professional development (TPD) approach.

The Program collaborated with the MoPSE to distribute the newly developed ULA and Mathematics materials just prior to the start of the 2022–2023 school year. Each teacher received a copy of the teacher guide and student book for each grade they taught; each student had a copy of the student book. The Program also established a Digital Platform housing additional instructional materials and resources for teachers.

The Program also supported the MoPSE to develop and deliver TPD opportunities that included a combination of 3 group-based training workshops of 2 days each and short, regular, and frequent learning opportunities during Methodological Days. The Methodological Days were offered once a month to the 9,000 primary grade teachers from the 919 Program schools in Sirdaryo and Namangan.⁴ In addition, the Program introduced Zoom question and answer sessions for the same teachers. These teacher development opportunities took place from August 2022 to April 2023 and covered 7 main topics for both ULA and Mathematics teachers in primary grades. **Figure 2** shows how the inputs and supports that the Program provided were intended to combine to produce improved learning outcomes.

Figure 2. Summary of Program Theory of Change



⁴ Methodological Days occur once a week and were established by the MoPSE to provide primary teachers with dedicated time for class preparation and professional development.

Program M&E data allow the Program team to assess the extent to which the different elements of the theory of change did (or did not) come together productively to improve outcomes.

Specifically, the analysis team combined data on teacher participation in professional development opportunities with the results of a survey of teacher self-efficacy, observations of teacher practice, and the baseline and endline EGRA and EGMA results to attempt to answer the following research questions:

Do schools in which teachers participated more regularly in professional development opportunities have better average performance in ULA and Mathematics?

Do schools in which learning materials were present and teachers were observed to be using improved instructional techniques have better average performance in ULA and Mathematics?

Lastly, we used a recently completed teacher survey to ascertain the extent to which teachers in Program schools were still applying the new instructional techniques introduced by the Program during the school year underway (in which the Program was no longer actively supporting school-level implementation).

FINDINGS

TEACHER TRAINING

As mentioned above, for the 2022–2023 school year when the new ULA and Mathematics materials and instructional approaches were being implemented in Program schools, the Program provided three in-person trainings: one in August 2022, one in November 2022, and one in March 2023, plus an additional three in-person practice sessions on Methodological Days, which are authorized professional development days within the Uzbek education system. Over 6,300 teachers attended over 70% of the trainings offered by the Program throughout the 2022–2023 school year.

Teachers completed a post-training test at the end of each in-person training to assess the extent to which they understood the new instructional approaches that the Program introduced. Post-test scores were consistently high. On average teachers answered correctly close to 90% of the questions related to techniques for teaching ULA and Mathematics. Using these data, we attempt to answer the first research question:

Do schools in which teachers participated more regularly in professional development opportunities have better average performance in ULA and Mathematics?

Students in schools from which teachers attended more than 6 trainings (both in-person and during Methodological Days), which constitutes at least 70% of the all training sessions, scored better on average on some ULA outcome measures as shown in **Table 1**.

Table 1. Differences in ULA Learning Outcomes Based on Teacher Participation in Training

	Adjusted Baseline to Endline Increase in Average ORF (cwpm)	Improvement in Students' Meeting ULA Fluent Reader Benchmark (Percentage Point Increase)
Grade 2		
Attended 3 or fewer trainings	0.2	na
Attended 6 or more	4.5	na
Grade 4		
Attended 3 or fewer trainings	11.5	5.4
Attended 6 or more	15.5	13.8

Note: There were no gains in the percentage of students meeting the benchmark in grade 2.

In schools with teachers attending six or more training sessions, the increase from baseline to endline in the share of students who were fluent readers was more than double the increase seen in schools where teachers only attended three or fewer trainings.

For math, teacher participation in professional development opportunities showed no association with outcomes.

In addition to the post-training assessments, teachers were evaluated on the extent to which they perceived themselves to be capable of effectively teaching ULA and Mathematics. Measures of teacher self-efficacy introduced by the Program consistently showed that over

90% of teachers agreed with statements such as, “I always find better ways to teach math (or ULA)” or “I know how to effectively teach math (or ULA) concepts.” Because of the lack of variation in these measures of teacher self-efficacy, we could not detect any correlation between them and student outcomes.

CLASSROOM OBSERVATIONS

The Program documented over 4,200 observations of teaching practice,⁵ split roughly evenly between ULA and Mathematics lessons. Observations of lessons noted the instructional practices that the Program introduced and encouraged teachers to use in their ULA and Mathematics classes. Depending on whether the observation took place during the first or second quarter of the school year, there were different total numbers of observed behaviors that teachers should have demonstrated. **Figure 3** below summarizes the mean scores (percentage of desired instructional techniques observed being used) for first and second quarter observations of math and ULA.

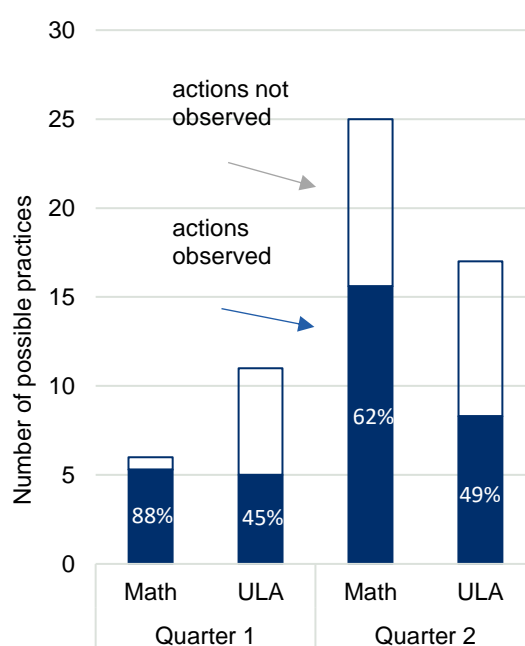
Examples of practices frequently observed during math lessons include:

- The teacher asked a student to explain how they got the correct answer.
- The teacher explained how to complete an assignment after asking students to do it.
- The teacher conducted the discussion phase of a lesson.
- When receiving an incorrect response, the teacher discussed with students why an answer was incorrect.

Examples from ULA lessons include:

- The teacher asked additional questions to extend a discussion.
- The teacher engaged students who were not actively participating.
- The teacher listened and gave the student enough time to explain their thinking.
- The teacher walked around observing students during reading comprehension exercise.

Figure 3. Percentage of Possible Observed Practices During Math and ULA Lessons



In addition to documenting the teaching practices most often observed during Mathematics and ULA lessons, the Program analyzed data from classroom observations in relation to the learning outcomes achieved in the Program schools on the endline assessment. The results of these analyses helped us respond to the second research question:

Do schools in which learning materials were present and teachers were observed to be using improved instructional techniques have

⁵ In total, the Program conducted over 7,034 classroom observations. However, the number of observations that could be linked with other data sets and used for this analysis was 4,200.

better average performance in ULA and Mathematics?

The Program team examined the relationship between each newly introduced math- and reading-related teaching practice and student outcomes on the overall math score and between each ULA-related teaching practice and outcomes on ORF, reading comprehension, and the percentage of students meeting the benchmark for fluent reading. The math and reading scores of students whose teachers were observed using Program-introduced techniques were compared to the scores of those whose teachers were not observed using the desired instructional methods.

In 410 schools with classroom observation data and where the teacher received⁶ the teacher's guide for mathematics, on average, the overall math endline scores for grade 4 were 6 percentage points higher. In addition, one math instructional technique in particular demonstrated a relationship to students' overall performance on the math assessment. In 222 schools where teachers were observed explaining how to solve another problem related to the topic of discussion of the lesson, students scored 10 percentage points higher on the endline math assessment.

For reading, certain observed instructional techniques in particular were associated with improvements from baseline to endline in grade 4 ORF. For example, in schools where teachers were observed at least once summarizing answers for the class after the students finish an assigned task, there was a gain in grade 4 learners' average ORF of an additional 15 cwpm from baseline to endline. Also, in schools where teachers asked students to give the meaning of newly introduced vocabulary words, there was a gain in grade 4 learners' average ORF of an additional 11 cwpm. And in schools where the teachers demonstrated how students should discuss questions in pairs, learners saw an average gain of an additional 9 cwpm in ORF.

Additionally, the Program team categorized Program schools as high performing if on the endline assessment more than 75% of their grade 4 students met the benchmark for fluent reading.⁷ Using this criterion, about one-third of schools were classified as top performing.

Teachers in top performing schools were more frequently observed during math and reading lessons to ask students to work in small groups or pairs. This was especially so during the oral speech assignment portion of ULA classes. They were also slightly more frequently observed during ULA lessons to seek to engage students who were otherwise not participating in the lesson and were more frequently observed to provide extra tasks to students who had completed an assignment.

FOLLOW UP DURING SCHOOL YEAR 2023–2024

To determine the extent to which teachers were continuing to use the instructional techniques introduced by the Program, the team conducted an online survey of teachers in Program schools in December 2023 and January 2024. **Table 2** below shows the percentages of teachers who felt negatively about the new instructional technique when it was first introduced during the trainings provided in the 2022–2023 school year. It also shows the percentages of teachers who stated that they were still using the listed techniques often or every day during the 2023–2024 school year.

⁶ In 40 classrooms (less than 1%) for which observation data were available, teachers said that they had not received the teacher's guide. However, the Program had distributed and topped up teacher guides to the schools by October 2022. The classroom observations began in November 2022, when all teachers should have received the teacher guide.

⁷ ORF of 70 cwpm or higher and reading comprehension score of at least 80%.

The recently completed survey asked teachers how negatively or positively they initially viewed the different instructional techniques listed in *Error! Reference source not found.* to gauge how unfamiliar those practices were to teachers (or at least how different from what they were accustomed to considering as useful instructional techniques). On most items, 5% or fewer of teachers reported that they had initial negative views of the Program's instructional technique (as opposed to viewing them either neutrally or positively). The main exception concerned the practice of discussing incorrect answers with students during math lessons, which 10% of teachers initially viewed negatively.

Table 2. Percentage of Teachers Using Specific Program-Introduced Teaching Methods

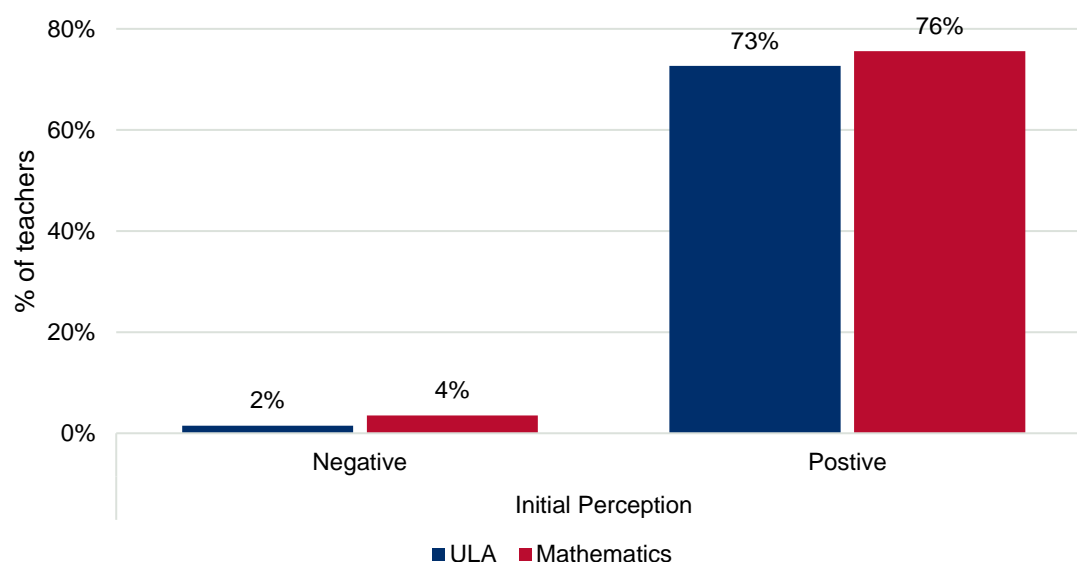
Math Lessons:	Viewed it negatively when introduced	Still doing often or every day
Do you discuss with students different ways to solve examples/problems?	6%	55%
Do you discuss incorrect answers to examples/problems with students?	10%	41%
Do you ask students to explain their answers?	4%	57%
Do you explain to students how to solve examples/problems?	4%	94%
Do you give students enough time to work independently on examples/problems?	5%	87%
Do you monitor students during independent work and help students who are struggling?	4%	90%
Do you monitor students during independent work and ask additional questions to students who finish the activity quickly?	4%	86%
ULA Lessons:	Viewed it negatively when introduced	Still doing often or every day
Do you ask students to guess what the story is about before reading it?	5%	79%
After the students have answered the questions, do you ask them additional questions to continue the discussion?	3%	92%
Do you ask students to relate the story to their own lives and experiences?	2%	90%
Are you using graphic organizers?	5%	73%
Are you encouraging students to write based on creative ideas, giving students exercises to express their ideas?	3%	89%

The above data also show that a significant proportion of participating teachers reported continuing to apply the evidence-based instructional practices introduced by the Program even without any continued active intervention or ongoing support by the Program. This was particularly true for practices such as explaining to students how to solve a problem in math or asking students additional questions to continue a discussion in ULA. However, for math especially, fewer teachers reported continuing to use those instructional practices geared to promoting higher order understanding and application of math concepts. Those practices that were less continued included promoting different ways to solve problems, encouraging students to discuss incorrect answers, and asking them to explain the reasoning behind correct answers.

The Program team further analyzed the relationship between teachers' reported initial perception of the instructional methods that the Program introduced and how often they

reported using those techniques even after Program support had ended (i.e., during the 2023–2024 school year). **Figure 4** shows that in fact a much higher percentage of teachers who stated that they had positive initial perceptions of the instructional techniques claimed they were still using those techniques either often or every day.

Figure 4. How Often Teachers with Different Perceptions Reported Still Using the Program’s Instructional Techniques



Lastly, the team analyzed whether a teacher’s continuation of the evidence-based instructional practices in 2023–2024 was associated with the performance of their students in 2022–2023. We found little association of the Program-introduced practices teachers reported they continued to use in 2023–2024 with students’ prior performance in 2022–2023 in either ULA or Mathematics. However, there were some small indicative relationships between a teacher’s first impressions of an instructional practice introduced by the Program and the performance of their students in ULA.

For example, teachers who stated that they responded positively in 2022–2023 to the technique of encouraging students to write based on creative ideas had students with average ORF scores 10 cwpm higher than those of the students of teachers who stated that they responded negatively to that technique in 2022–2023. Similarly, students of teachers who reacted positively to asking students to relate a story to their own experiences had average ORF scores 7 cwpm higher than students whose teachers reacted negatively.

CONCLUSION

The additional analysis of data from the Program shows that there was improvement in reading ability, in particular among grade 4 learners. However, the data also show that two-thirds of grade 4 learners on average at endline were still scoring too low to be classified as fluent readers.⁸

The Program was implemented for only one school year, yet teacher participation in the trainings that the Program developed and delivered was associated with slightly higher performance by their students in reading. No such association was noted for math. We also saw that schools with a higher share of students achieving the benchmark for fluent reading had more teachers observed to be using certain evidence-based instructional techniques introduced by the Program. For math lessons, these included the teacher explaining how to solve another problem related to the topic of the lesson, asking at least one open-ended question, and asking students to work in groups or pairs. For ULA lessons, these included the teacher asking students to provide the meaning of or form sentences with new vocabulary words, summarizing the answers after students finished a task, and demonstrating for students how to discuss a question in pairs or small groups.

Despite having a large quantity of monitoring data, rigorous analysis of the relationships between teacher training, teacher post-training evaluation scores, measures of teacher self-efficacy, observed teaching practice, and learning outcomes was challenging. The various datasets could not easily be linked, and when combining data, the number of teachers and schools for which all the data were available was limited, meaning that the relationships analyzed did not register as statistically significant. This limited our ability to reach definitive conclusions. The follow-up survey with the Program team was completed in December 2023 and January 2024. It provides some promising findings. More than 50% of teachers appeared to be continuing to use most of the evidence-informed instructional techniques for math and ULA that the Program introduced, even though the Program was no longer providing direct support to them and their schools.

⁸ The definition of fluent reader is 61 or more cwpm and reading comprehension of 80% or above. For information on how the benchmarks and cut scores are set, please refer to the Early Grade Reading and Mathematics Endline Impact Evaluation Report from 2023, available at: <https://shared.rti.org/content/uzbekistan-education-excellence-program-ueep-early-grade-reading-and-mathematics-endline>