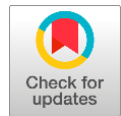


# Getting closer to the achievement gap in urban education, promoting first-year reading success



Nidhi Rastogi<sup>a</sup>   | Bineet Desai<sup>b</sup>  | Vinoth S.<sup>c</sup> 

<sup>a</sup>Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India, Department of Management Technology.

<sup>b</sup>ATLAS SkillTech University, Mumbai, India, Professor, ISME - School of Management & Entrepreneurship.

<sup>c</sup>JAIN Deemed to-be University, Bangalore, India, Professor, Department of Finance.

**Abstract** The goal of this research was to evaluate the efficacy of Reading RACES (RR), a computer software that offers a repeated reading intervention with culturally relevant texts. This research definitely looked at how RR affected first-grade students in an urban setting's oral reading fluency (ORF) and comprehension gains, as well as whether such improvements would transfer to unfamiliar, generic texts. Five African American first-graders at risk of failing to master reading skills were chosen to take part in this research. The usage of RR and student increases in ORF and understanding were shown to be functionally related, according to the results. The ORF and understanding of rehearsed passages improved moderately too significantly for all research participants. The findings also demonstrated that even a month after the intervention, reading abilities persisted and were generalized to fresh texts. These results increase the body of prior evidence that supports RR.

**Keywords:** culturally relevant, reading RACES, ORF, DORF, AIMSweb

## 1. Introduction

Closing the achievement gap is important for fostering social mobility and educational fairness because it guarantees that all students, whatever their circumstances, have equal opportunity to realize their potential and achieve academic success. The achievement gap is the term used to describe ongoing differences in learning performance and educational accomplishments between different student populations. The inequalities in academic performance between students from low-income families or disadvantaged groups and their counterparts from more privileged backgrounds are often the subject of the phrase. The achievement gap can appear in a variety of ways, including disparities in academic success, college enrolment, graduation rates, and standardized test scores (Broer et al 2019).

Urban education is the branch of schooling that concentrates on the special difficulties and possibilities that urban or inner-city settings bring. It takes into account the particular requirements and conditions that apply to students, teachers, and schools in metropolitan areas. The study of urban educational institutions as well as the creation and application of plans to enhance educational results in urban settings are all included in the field of urban education (Barber 2021). Urban education works to reduce the achievement gap that exists among urban learners and those living in regional or rural regions by offering fair educational opportunities. It underlines how important it has become to modify instructional strategies and assistance programs to address the unique demands of urban children. A multidisciplinary strategy for urban education takes into account elements including curriculum creation, teacher preparation and support, community involvement, school leadership, social services, and educational policy. To promote a safe and caring learning environment for children, coordination between teachers, administrators, lawmakers, community groups, and families is often necessary (Bryan et al 2020). Urban education initiatives can concentrate on a variety of things, such as enhancing academic performance, decreasing dropout rates, increasing college and career readiness, fostering cultural responsiveness, encouraging social and emotional growth, addressing systemic inequities, and developing safe and welcoming school environments. Urban education attempts to guarantee that all children in urban areas, irrespective of their socioeconomic standing or conditions, have access to high-quality education and opportunities that will set up them for success in school, jobs, and life (Peacock et al 2021). Promoting first-year reading success is the practice of supporting and advancing pupils' comprehension skills and accomplishments throughout their initial period of higher learning or schooling. This emphasis on first-year proficiency in reading acknowledges the vital contribution reading makes to a child's overall academic growth and potential for achievement. Promoting first-year reading achievement primarily aims to make sure that children acquire solid reading core abilities such as recognition of phonics, fluency, vocabulary, and comprehension. Teachers and parents may help young students become competent readers and cultivate a lifetime affection for reading by offering tailored teaching and interventions. The achievement of first-year readers lays a solid basis for future academic success (Clarke and Burt 2019) The



proactive procedures and tactics used to make sure that first-graders in an urban education environment achieve good reading outcomes and avoid challenges with reading acquisition are known as avoiding urban first graders from falling behind in reading. Early detection of students at risk of reading failure and the implementation of focused interventions to meet their requirements are required (Lekwa et al 2019).

The persistent differences in performance in school and educational achievements between various student groups, particularly along racial and socioeconomic lines, are referred to as the achievement gap. In urban schooling, where discrepancies often are more severe owing to numerous social and economic variables, closing this gap is essential. A term that stresses the objective of reducing this gap and fostering fair educational opportunities for all students in urban settings is getting closer to the achievement gap in urban education. It suggests a concentrated effort to lessen the gaps between less advantaged students and their more fortunate peers by improving the educational experiences and results for underprivileged students (Plucker and Peters 2020). Providing early learning programs, implementing evidence-based instruction in reading, offering more assistance for readers who struggle, encouraging enthusiasm for reading through interesting and culturally relevant materials, encouraging parental involvement in literacy activities, and offering professional development for teachers to improve their instructional methods are some actions that can be taken to promote first-year reading success (Lewis 2019). To examine the consequences of combining CR pedagogy with RRI based on studies on the reading fluency and comprehension of at risk first graders in an urban context, the present study used a hybrid approach.

## 2. Literature Review

Von der Embse et al (2019) looked at the processes and procedures required to provide urban school-based mental health services at Tier I and Tier II. This decision-making framework was created via an iterative process including input from school-based partners, regular and scheduled reviews of program efficacy, and the gathering of data to inform important decisional cut points. Hinnant-Crawford (2023) investigated the connection between teacher-reported classroom goal orientation and U.S. federal education regulations. In a sequential explanatory approach, survey data from around 260 instructors and seven teacher interviews were examined together. The impact of accountability rules on student results and, to a lesser degree, education, has been studied by academics. Little empirical research has looked at the connection between policymaking and pedagogy outside of test preparation and curricular specialization. Brown et al (2019) ignored the numerous methods hazards for educational failure are generated within routine educational processes and instead interprets risks expressed as statistical chances and mostly concentrated on static and individual risk variables. The idea of hazards is often used in dropout investigations as an approach for comprehending the ongoing issue of high school dropouts among learners of color in urban schools. Tanase (2022) provided 22 secondary math and science teachers monitoring. The objective was to evaluate the cultural responsiveness of some of the tactics utilized in urban schools. In all metropolitan environments, demographic statistics indicate that the student population is becoming more diverse. On the opposing side, there is still a disparity between the student and the teaching force in the US, with the majority of instructors being female, middle class, monolingual, and of European heritage. Lee et al (2021) determined 327 urban middle school children were assessed for their educational self-handicapping behavior, success-oriented mind-sets, and math and reading performance. To determine if attainment objectives were responsible for the relationship between past performance and self-handicapping behavior and how the connections were affected by the presence of disadvantaged minority students, mediation-based regression analyses were carried out. Hines et al (2021) investigated the way pre-service teachers saw their readiness to instruct utilizing CRP techniques in the classroom. There has to be a paradigm shift to bridge the accomplishment gap. An attitude shift is necessary to address the accomplishment gap. To implement this transformation and link classroom learning goals with students' daily lives, CRP tactics must be used. This will lessen achievement gaps in schools. Butler et al (2021) inquired to learn more about the pre-and post-college experiences of Black men who were successfully admitted to a postsecondary school. Males of color face several obstacles to attending college and are commonly disadvantaged in postsecondary educational institutions. McCallops et al (2019) evaluated how preservice teachers' attitudes about justice and how they see working in urban schools relate to each other. Using a critical interpretative case study approach, we examine several journal entries from a varied group of aspiring teachers to see whether their perceptions of urban schools and children were affected by their involvement in service-learning activities.

Sims and Ferrare (2021) addressed the significance of these results and provide suggestions for further investigation into treatments for social-emotional learning that are culturally appropriate in urban schools throughout the world. Urban schools that compile and analyze 51 research findings on student results, culturally sensitive techniques employed in each intervention, and strategies implemented. Hoffman and Martin (2020) received a step in examining this variance by looking at how first-generation college (FGC) freshman from rural and urban areas utilize their social networks differently to assist them in making college major and career decisions. FGC students are defined as having parents with comparable levels of education, and they often get assistance on university campuses as if they are a homogeneous group. The varied histories of FGC students, however, may call for various kinds of assistance. Tichavakunda and Galan (2020) provided a preliminary analysis of a middle school language arts and literacy program used by an urban school district. They examine the effects of the district's switch to non-skill-based Reading and Writing Workshop Models curriculum by speaking with a limited number

of 4 educators along with a literacy coach, collecting preliminary data, and watching students in literacy schools. Henry (2019) examined a cohort of 33 recently graduated students from the same urban, public high school to better understand this crucial period. First-generation students have particular difficulties throughout the summer before college because they often lack supervision in performing chores connected to the college.

### 3. Methodology

This section discusses ensuring educational fairness and enhancing student results, including closing the achievement gap in urban education and encouraging first-year reading performance.

#### 3.1. Setting

Pre-K across fifth graders attended the urban primary school where this research was conducted. The institution of learning was located in a big city in the Midwest, and the majority of its kids hailed from low-income homes. 92% of the students in this research were Black, 5% were White, 2% were Multiracial, and 1% were Hispanic. In two distinct first-grade classes where reading teaching concentrated on entirety categories actions with continuation worksheets and individual tasks in each classroom, participants for this research were chosen from the student body. The investigation was conducted in the school library's rear section, which included a computer workstation with sufficient outlets for the laptops needed for this research assignment.

#### 3.2. Participants

This research included five first-graders who had reading difficulties. Utilizing reading evaluations from Fountas and Pinnell, the first-grade instructors selected for study participants the student who were not doing well in reading at the start of the year. The Dynamic Indicators of Basic Early Literacy Skills Next (DIBELS Next) edition subtests DIBELS Oral Reading Fluency (DORF) and Nonsense Word Fluency (NWF) were used by the investigators to expand on these youngsters' decoding and oral comprehension abilities. Students have to fulfill the following requirements in addition to instructor recommendations, to indicate poor reading fluency in comparison to their peers, students must read at least 18 Correct Letter Sounds (CLS) on the NWF subtest and obtain the smallest DIBELS ORF (DORF) values on screening. The single participant, Noah, who was not suggested by the teacher, was additionally one of the lowest scorers and fulfilled the decode requirements. Since there existed no baseline for preschoolers at the start of the year, investigators were unable to adopt a particular cut-off for the DORF. Table 1 for an overview of application information and starting grades.

**Table 1** Information about participants and screening tests.

Name	Gender	Age	DIBES	
			Median ORF	NWF
Tristen	Male	6-10	11	47
Noah	Male	6-2	14	24
Mia	Female	7-0	9	26
Jerry	Male	6-6	9	40
Jack	Male	6-9	5	23

The data shows that the majority of SHG members are experiencing social groups for the initial period. The majority of them were presented by current members. This demonstrates that the informal trust and solidarity amongst current members support the formal building of social assets of SHG formation. A large number of monthly meetings and increased opportunities for members to rotate into important roles like chairman, secretary, or treasury of SHG have aided in maintaining the social asset.

#### 3.3. Materials

##### 3.3.1. Computer equipment

The RR software was provided through four Dell laptops. To operate the reading application, among these laptops was utilized serving and coupled with a Linksys Wireless Broadband Router. The RR system as well as the delivery of CR and Nonculturally Relevant (NCR) sections were carried out on the other computers. Each laptop came with a wireless mouse, a Logitech headphone featuring a microphone so that learners could hear the course material while collecting their readings, and an audio recorder.

##### 3.3.2. CR maze passages

Deleting each seventh word from the passage, researchers produced maze comprehension evaluations that mirrored the CR passages; students chose the correct word from a list of three options to fill in the blanks. When the student clicked

on the appropriate term, it was clear that they had understood. Once the maze was complete, RR determined the right solutions and created a grid to show the beginners their test-taking progress. A star was added to the graph of every student who completed the maze evaluation with a perfect score.

### 3.3.3. RR software

Students were given CR and AIMSweb Passages (AP) using this program utilizing the Repeated Reading Instruction (RRI) sequence.

### 3.3.4. CR passages

To gather background material for their tales, previous researchers on this investigation visited instructors, parents, and children to construct 25 first-grade CR passages. The sections with an assessment range of 1.4 to 2.6 were compared using the Spache Readability Index and an approach to statistics.

### 3.3.5. Generalization passages (GP)

GP were chosen by investigators from the AIMSweb dataset. Since the passages in AIMSweb were generalized and didn't expressly target being made culturally sensitive to the community of this research, they were noted that NCR portions in this investigation. The Spache readability method was used to choose passages from this dataset based on the level of education challenge, which ranges from 01.4 to 02.6.

### 3.3.6. Rewards

Following the conclusion of the day's intervention session, students choose a sticker.

## 3.4. Materials

Researchers used an approach with multiple baselines among individuals to assess how the RR intervention changed students' ORF and comprehension of CR and AP. To assess if students individually observed the computer order, investigators also gathered operational integrity.

### 3.4.1. Independent variable

The RR intervention, which included CR and conceptualization passages as well as the RRI supplied via computer software, served as the independent factor in the study. In 11–15 weeks, participants attended between three and four sessions each week, each of which lasted between 25 and 40 minutes. After reading a narrative, participants got comments from the RR software and encouraging remarks from the investigators. Using 25 CR and 17 AIMSweb tales, the RR computer software performed an ongoing reading treatment. Students heard an individual read a chosen text before having the chance of practicing reading it themselves thanks to RR. Learners may click on unfamiliar phrases while rehearsing the tales, and the system would then read the passage to them. A system program afforded students any missing cold reading preparation sentences. This part included the processor simulating reading a particular word before reading it in the context of the phrase. Students achieved their objective, the maze exam was administered by the computer, and a graph of their results was shown. After finishing each labyrinth, students examined their graphs; however, no particular data were gathered to determine how seeing the graphs affected the students' reading abilities.

### 3.4.2. Praise and corrective feedback

The researchers commended the student for their concentration, diligence, and accomplishments after the sessions. The students got corrected feedback on every single reading fault made throughout the instruction portions of the intervention. During the evaluation phases, there was no feedback provided.

### 3.4.3. Praise and corrective feedback

The initial factor that depended proved students' CWPM throughout the CR oral passages on RR cold read. Phrases scored against the student's total if they were read properly within three seconds or if the learner committed a first fault before individually fixing it. If a student pronounced an item incorrectly or did not say it within three seconds, the word was considered wrong. Following the 1-min time, the investigators entered each pupil's last words read and any mistakes and the computer then estimated the student's CWPM. After their first read, students participated in the reviewing words section of the intervention, where they practiced the phrases, they overlooked to get correction feedback. The CR maze assessment's accurate replies served as the second dependent variable. If the word chosen was an original phrase from the narrative, the response was considered right. Students could observe a line graph as a result of their proper responses. For this evaluation, zero corrections were made. In the GP, the students' CWPM served as the third dependent variable. After achieving their aim

while reading the CR chapters, students read GP. Students were supplied a section with a generalization if they performed successfully in reading three consecutive CR tales on their first try. Students were not given a GP until after they had successfully read three CR tales if they were required to read the tale a second time. The student's performance on the generalization mazes served as the fourth dependent factor. The mazes performed in the same way as the CR mazes.

The student's level of development based on their DIBELS Next standard tests administered at the start of the academic and end of the year served as the fifth dependent factor. The typical every-week increase for students' ORF may be computed by considering their starting CWPM, using "Hasbrouck and Tindal's" ORF information. The typical weekly phrase increase for individuals was multiplied based on how many weeks they took component in the intervention, and the result was added to their original midpoint DIBELS ORF to get their predicted ROI. For children in preschool into the third grade, DIBELS Next assesses fundamental early reading abilities. Investigators adhered to the administrative guidelines established by the DIBELS Next designers. Based on Kaminski, Dewey, Powell-Smith, and Good, the first-grade NWF's alternate-form dependability was 0.85 for a just one test and 0.94 for the 3-test form. Availability on the first-grade DORF was 0.91 and 0.96 for the solo and three-test versions, respectively.

### 3.5. Processes

#### 3.5.1. Baseline

Students examined six stories, 3 from CR and 3 from AIMSweb, in an arbitrary sequence. The students started by pressing the "timed reading button" and reading a passage for one minute. For this single read, investigators gathered ORF information related to various cold read judgments. Students next completed the 3-minute labyrinth test that corresponded with the paragraph they had just read. Children read one piece per day, and the investigators used analysis of data to identify which children should be put in the top tier following at least six days of baseline reading. The first two people to undergo intervention had the least stable ratings.

#### 3.5.2. Training students for RR

Participants got instructions regarding how to use the RR software before beginning the intervention. To guarantee procedural integrity for all of the participants, a training screenplay was developed. Following the plan, the investigators demonstrated each step to the participants. The lesson from the CR tale (Grandma's House) which was used exclusively for instruction and was never a component of the intervention, was utilized to guide individuals over the precise order of the program. Before starting the intervention, contestants had to complete every item on the instruction worksheet accurately.

### 3.6. Social Validity

#### 3.6.1. Teacher social validity

To gauge teachers' opinions of the RR platform also its assessments of the intervention's advantages for children's reading abilities, investigators sent applications to participants' classroom instructors. The instructors and researchers gathered to discuss the results of the surveys thereafter.

#### 3.6.2. Student social validity

Students were asked to answer an oral interview after the research on their feelings about taking part in the work, the elements they found to be most appealing, along with what they might change about the intervention. To reduce bias in responses, an additional investigator performed the interviews.

### 3.7. Interobserver Agreement (IOA)

All project stages included training for two Graduate Assistants (GAs). Every single GA got turns acting as the additional observer to confirm the information gathered by the initial observers. During every individual involved in the experiment, another witness participated for a minimum of 50% of the intervention, generalization probes, baseline, maintenance, training, and social validity assessments. The sum of each contract was split by the sum of all consents and disputes, followed by multiplication by 100 to arrive at the actual deal. The following were the average IOA estimates for each of the five students who took part in every phase of the treatment. IOA was 98.9% throughout baseline CR and AIMSweb passing, and it was also 98.9% throughout therapy inquiries, 99.4% after generalization inquiries, 98.2% throughout intervention average approval, and 99.7% during maintenance.

### 3.8. Treatment Integrity

Following performing baseline, education, intervention, and maintenance, a second witness observed every investigator for a minimum of 70% of the supplementary tests using a prewritten questionnaire. Employing a pre-written

checklist, a second witness watched each researcher. DIBELS Pre- and posttests, CR and AIMSweb baselines, and ongoing servicing will follow. The distribution of the information is as outlined below: pre and subsequent tests at 100%, baseline data at 100%, including CR and AP, therapy probes at 80%, intervention probes at 78.9%, generalization probes at 82.1%, and follow-up data at 100%.

#### 4. Results

##### 4.1. CR Fluency and Maze

Baseline, intervention, and maintenance ORF improvements for CR and AP for students are shown in Figure 1. After the intervention, all students exhibit a rising trend in their ability to read new CR sections, compared to their baseline performance. Significantly, Jerry and Noah's reading information on CR passages showed nearly no overlap between the two data levels, suggesting a positive intervention impact. Similar rising tendencies were seen for maze scores on CR sections. The percentage increase and indicated ORF and maze ratings for CR passages from pre-intervention to post-intervention are shown in Table 2.

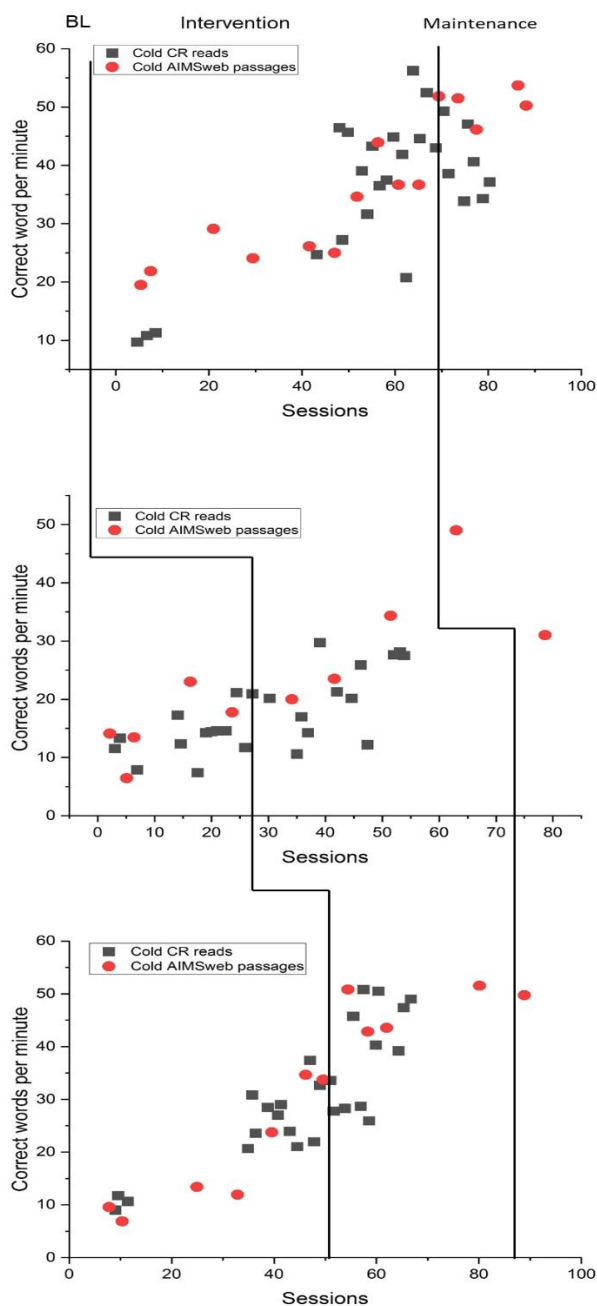


Figure 1 Correct phrases per minute for Tiers 1 through 3 in a single session.

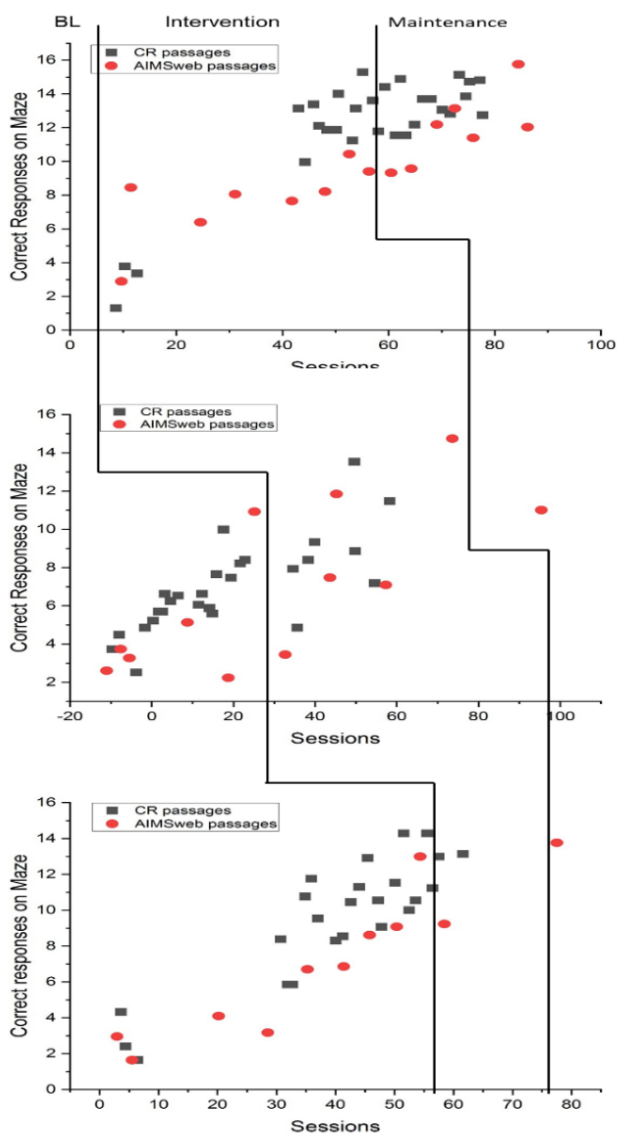


**Table 2** Student Development Based on Baseline and Intervention Passages Scores.

Student	Mean Correct responses on CR maze			Mean CWPM on CR passages		
	BL	BL	Int.	PI%	Int.	PI%
Noah	2.1	10.4	42.1	300.1	14.3	562
Tristen	3.1	11.8	19.1	55.9	8.5	144.4
Jack	4.4	3.1	15.4	382.1	5.4	23.11
Jerry	2.5	10.6	35.6	249.10	12.6	397.7
Mia	2.1	12.09	20.6	67.9	8.9	292

4.2. AIMSweb Fluency and Maze

Students improved at a comparable rate on their CR passage and maze exams as they did on their AIMSweb generalization inquiries and exams. All of the students improved significantly, particularly Tristen and Jerry who did not have overlapping measurements from baseline to intervention. Considering a single overlapping measurement from baseline to intervention, Noah similarly demonstrated a significant improvement. The students outperformed their baseline fluency scores on maintenance probes, which were administered two weeks and one month following the conclusion of the training by using AP (shown in Figure 1). Every student's maze test during maintenance showed no overlap between baseline and intervention (shown in Figure 2). Table 3 displays the percentage gains for students on the maze and passage examinations on AIMSweb. Percentage gains of greater than 100% were seen for all students.



**Figure 2** Correct answers on understanding of a maze per session.



**Table 3** Student improvement utilizing baseline and intervention scores from AP.

Student	Mean correct responses on AIMSweb maze			Mean CWPM and percentage of increase on AP				
	BL	BL	Int.	PI	M	Int.	PI	M
Noah	7.4 (0-9)	21 (4.31)	48.6 (39.56)	134.6	57	10.9 (8-14)	57.8	16.5
Tristen	3.9 (3-4)	12.9 (8-16)	26.8 (20-39)	119.9	45	8.4 (3-13)	135.5	14.6
Jack	6 (3-8)	7 (4-11)	16.9 (9-27)	165.4	25	5 (4-9)	18.8	4
Jerry	5 (4-8)	9.5 (7-14)	39.9 (22-45)	167.4	25	4.8 (3-8)	18.7	4
Mia	1.4 (0.5)	10.5 (6-15)	22.5 (14-33)	132.11	44	8.2 (6-15)	502	12.6

**4.3. DIBELS**

All students showed moderate to considerable progress on the DORF examination, as demonstrated in Table 4 when their increase in Correct Words per Minute (CWPM) and percentage growth were taken into consideration. Jerry stands out among the group because he increased the reading from 8 CWPM at the start of the year to forty-four CWPM at the conclusion.

**Table 4** DIBELS Next values on ORF for BOY and EOY.

Name	EOY		BOY			
	The median for raw scores	Level of risk	The median for raw scores	Level of risk	Percentage evolution from BOY	
Jack	13	Well Below benchmark	6	NA	200.0	
Jerry	45	Below benchmark	9	NA	452.0	
Noah	48	Below benchmark	12	NA	352.0	
Mia	39	Below benchmark	10	NA	365.6	
Tristen	35	Below benchmark	12	NA	235.0	

**4.3. ROI**

According to these predetermined standards, the anticipated development of four out of five students was much higher. The statistics in Figure 3 show that the student's reading fluency was higher than would have been anticipated without focused instruction.

**4.4. Social Validity**

The RR software was favored by all of the students, and they all expressed a desire to keep receiving intervention in the years to come. Additionally, several commented that their favorite tales to read were the CR portions. All of the students said that they thought the curriculum had helped their reading. The reading progress of the students was also well-received by classroom instructors, who said they planned to use RR in the future.

**5. Discussion**

A practical relationship between the participants' ORF on new CR sections and the RR protocol was clearly shown in their responses, however, there was some variation. For instance, a few students' CR passages included overlapping information. Initially, the student had trouble maintaining his or her reading pace and was regularly griped about being to read for such extended periods. However, as the trial progressed and there was clear evidence of improvement, Mia spoke favorably about her advancement and showed more concentration and effort during the cold readings. Tristen maintained a single overlapped CR information point on an entire sentence with several unintelligible words, including (Larkish and Jamal.) Jack made slow but steady progress while working with several overlapping Information points. Jerry and Noah, however, did not have any overlapping Information points and showed a significant improvement in reading confidence between the baseline and intervention. The analysis of the maze evaluations also showed the students' development. Noah and Jerry performed the best on the CR maze comprehension tests, earning eight perfect scores, as they did on the other measures. The fact that these passages were only test questions may be one reason why students were not exposed to the material via the repeated reading process. Particularly accurate in terms of the fluency information, since the AIMSweb information



proved to have somewhat greater fluencies than the CR data and kept them during maintenance purposes. On the other hand, on AIMSweb, the total maze knowledge ratings were significantly lower than the actual CR sections. One explanation relates to every CR paragraph had progressively difficult words or phrases that students were still learning in first grade, but the CR passages also had supplementary material that was individually significant, which helped students understand the material better on the CR mazes. All participants improved steadily on their DIBELS Next tests, with 4 of the 5 showing significant improvements and Jack showing just modest improvements. The only student still in the danger category of (Well below Benchmark) was Jack. Jack was obedient and persevered in the intervention, but he had a very hard time remembering the fundamental knowledge required to complete scholastic activities. For instance, each youngster was given an ID with their laptop log-in details, which they all rapidly logged into memory. But during the intervention, Jack continued to copy from his card since he had forgotten his password. The other four students improved their reading fluency quite a little. For instance, Jerry made tremendous progress from eight CWPM to 44 CWPM; he is now only three CWPM away from the benchmark. On the end-of-year evaluation, Noah also showed outstanding growth, going from 10 CWPM to 44 CWPM, falling three words falls short of the standard. The statistics shown on the ROI graphs in Figure 3 are as, even more, compelling of the students' development in literature. Four of the students achieved very excellent to moderate development, surpassing the portion of predicted performance had they not received the intervention or evaluating benchmark to predicted and real development, approaching benchmark. At least two of the student may have exceeded the benchmark with a longer, stronger intervention. Jack kept up his very slow reaction rates, showing no sign of development. The participants' improved ORF on reading tasks lends credence to the idea that effective therapies may and should be employed with students who are younger than the age of three. These first graders managed to make significant progress and generalization of their knowledge, which offers some proof that efficient, early assistance might improve children's knowledge and perhaps stop greater performance disparities from developing in the future.

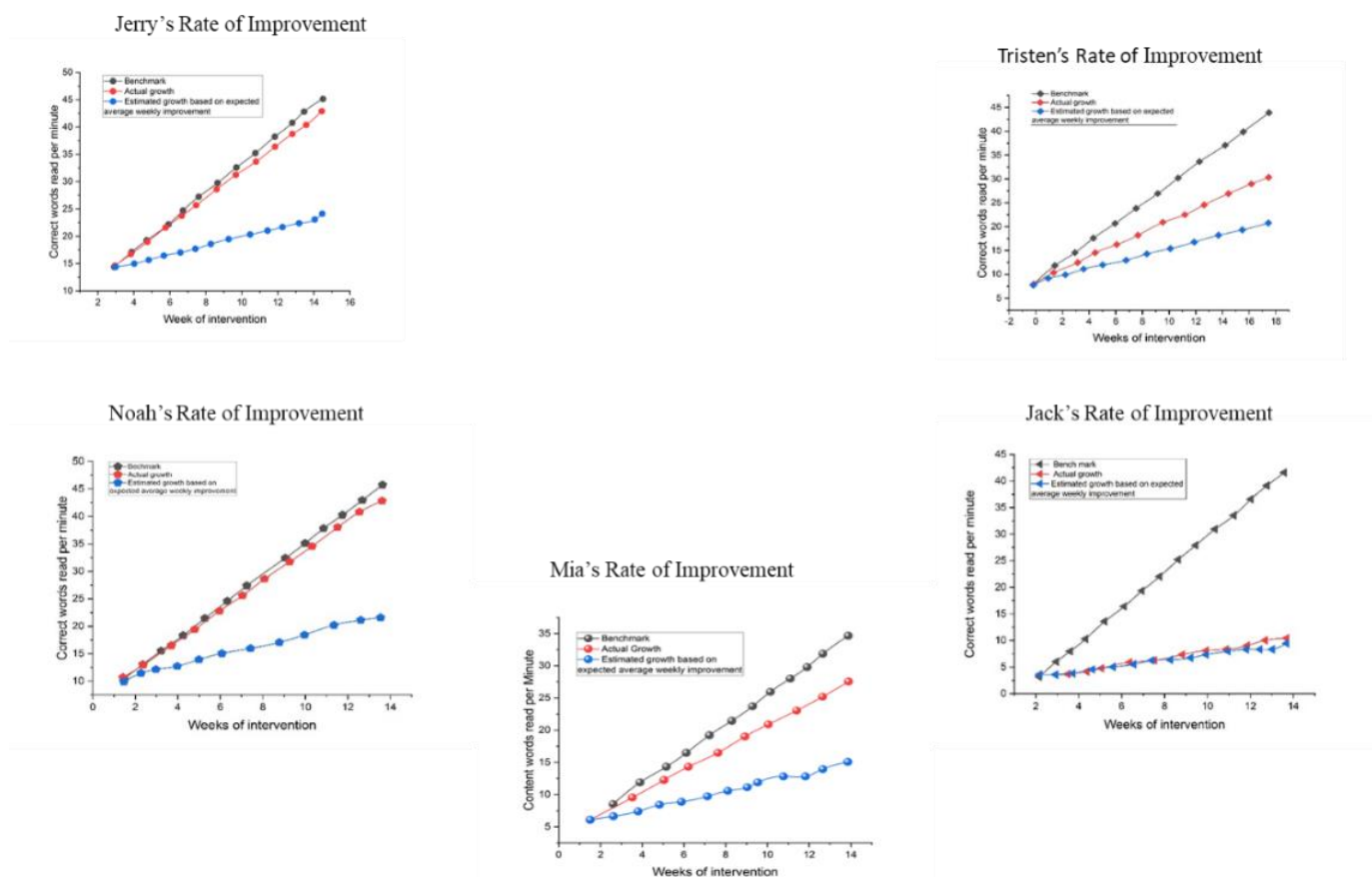


Figure 3 Improvement rate for all participants.

## 6. Conclusions

The outcomes of this research corroborate other studies showing that RR may successfully be employed to enhance comprehension and fluency in reading for first-graders in urban settings who are at risk for reading failing. Information displaying every student's ORF and comprehension ratings revealed an operational connection between RR and reading results. The ROI graphs, which indicate literacy increase rates for four of the five participants that are much greater than those anticipated, encourage these conclusions. In addition to the information that was gathered, anecdotal comments

indicated that the participants' trust in reading and effort had increased. According to social validity assessments, students were motivated to use RRI. Student participants showed that they could use the program and adhere to the instructions on their own with little assistance from personnel. For a multi-layered reading program that helped first-graders read better, RR used methods supported by evidence. Having this strategy, the risk of reading for first-graders in urban schools with constrained assets might be reduced. It will be crucial to keep developing this software technologically to make sure that it can be used in regular classroom and school settings.

### **Ethical considerations**

Not applicable.

### **Declaration of interest**

The authors declare no conflicts of interest.

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