

# Reading.com

ESSA Tier 4 Evidence of Efficacy  
(Demonstrates a Rationale)

Report produced by EdTech Recharge  
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## About Reading.com

Reading.com is an app that offers reading instruction, centering the learner and facilitated by an adult - parent, tutor, or teacher. By making evidence-informed instruction digital, interactive, and a “co-play” experience between learners and their supervising adults, Reading.com is a fun, co-play experience that takes children from letter recognition to confident reading in 99 lessons.

## Role of EdTech Recharge

EdTech Recharge, a third-party independent research firm, specializing in edtech and education-focused organizations, was contracted to develop the logic model (theory of change) for Reading.com to meet ESSA Tier IV requirements. All information presented herein is based on conversations and a review of the Reading.com application in Jan-Feb 2024.

## Objectives of this Report

This report is intended to demonstrate the rationale for the potential efficacy of Reading.com toward improving learning outcomes. The goal of this report is to meet ESSA Tier IV requirements by including a logic model based on rigorous research and planned efforts to evaluate the impact of the program. Specifically, this report will:

1. Present a logic model for Reading.com
2. Summarize rigorous studies demonstrating the rationale presented in a logic model
3. Present planned future efforts to study program outcomes.

## Note

This report only presents evidence demonstrating a rationale for why Reading.com may be effective. It does not provide causal evidence of efficacy. Part 3 presents planned future efforts to rigorously study program outcomes and may be subject to change at the time of implementation. Review the current version of Reading.com to ensure alignment with key inputs and activities presented in the logic model for efficacy consideration.



## Part 1. Logic Model

A logic model is a visual representation of key shared relationships among the key inputs, activities, outputs, outcomes, and impact for a program or product. A logic model also presents key assumptions and external factors that may shape potential impact. The core components of the logic model respond to specific questions as defined below:

- **Key inputs:** what are the key components of the product and additional resources that are needed to make an impact?
- **Activities:** what do key users do with the identified inputs?
- **Outputs:** what are the immediate results generated as a product of key activities?
- **Short term outcomes:** what changes can be expected when the product is used as intended for at least three months?
- **Long term outcomes:** what changes can be expected when the product is used as intended for at least one year?
- **Assumptions:** what are some inherent assumptions related to key inputs and activities that need to be tested?
- **External factors:** what may be some things that may influence the intended output and outcomes that are beyond the control of Reading.com that need to be monitored?

EdTech Recharge reviewed the Reading.com product, website, and shared resources to develop a draft logic model in January 2024. The Reading.com team reviewed the draft and provided revisions during virtual meetings and document reviews. The final logic model depicted below (Figure 1) reflects these conversations and revisions. Figure 1 presents the logic model demonstrating the theory of change for Reading.com by identifying shared relationships between key elements of their operations, key activities, immediate outputs, and intended outcomes in the short and long term for K-2 learners and their adults (parents or educators).



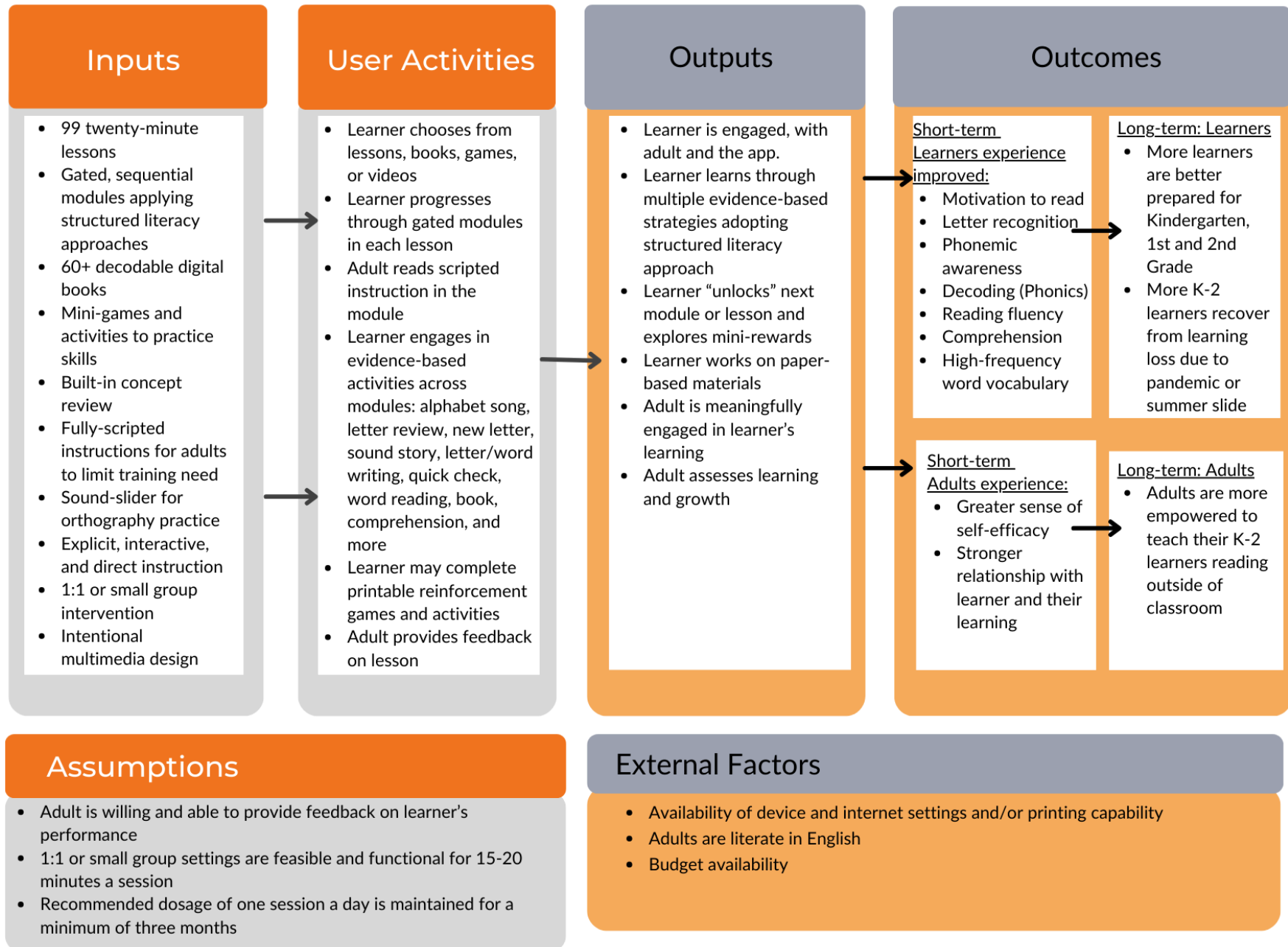
## Reading.com

Reading.com is an app that offers reading instruction, centering the learner and facilitated by an adult - parent, tutor, or teacher. By making evidence-informed instruction digital, interactive, and a “co-play” experience between learners and their supervising adults, Reading.com is a fun, co-play experience that takes children from letter recognition to confident reading in 99 lessons. Such lessons cover skills such as identifying phonemes and graphemes, phonemic awareness, decoding, print awareness, letter tracing and word formation, and reading comprehension. Each lesson is expected to take approximately 20 minutes and is a combination of multiple learning activities. Activities vary across groups of lessons based on complexity of skill and may include the alphabet song, review, new letter, saying sounds, blending letter sounds, rhyming, sound story, letter/word writing, word/book reading, comprehension and more.

The design of this application uses several evidence-informed inputs, as outlined in the logic model. The team designing the application consulted multiple books on reading instruction and conducted a review of current markets to identify what did and did not work. Five hallmarks of this application include:

- Hallmark 1:* Curricular design of the application **digitizes a structured literacy approach.**
- Hallmark 2:* Learning is a combination of **interactive learning and spaced review practice.**
- Hallmark 3:* Instructional design focuses on **developing learners’ intrinsic motivation.**
- Hallmark 4:* **Multimedia design** is directed toward optimizing engagement and retention.
- Hallmark 5:* The application **requires an adult** supervising and engaging with the child.

Part 2 of this report presents reviewed empirical studies that inform the development of the theory of change, including the determination of expected outcomes, tutored subjects, and delivery of tutoring.





## Part 2: Literature Review

Reading.com aims to increase learners' motivation to read, foundational reading skills, and their early reading outcomes toward the long term goal of improved preparedness for school and recovering learning loss. Additionally, since Reading.com requires adults to work with the learners, Reading.com also expects to positively influence adults' sense of teaching self-efficacy and their perceived relationship with both their learner and learner's learning progress.

In this part, we present a literature review that summarizes evidence informing Reading.com's logic model and theory of change. This review is organized around the five hallmarks identified in Part 1. Each hallmark is informed by education research and the relevant empirical evidence outlining the likelihood of improving learners' reading outcomes of the key inputs are presented in this literature review.

### Hallmark 1: Structured Literacy Approach in Digital Application

Reading, writing, speaking, and listening are all elements of literacy that are practiced by the learner when they use *Reading.com*. The pedagogy underlining the application's design closely aligns with traditional structured literacy approaches that center the use of systematic, cumulative, and explicit instruction to enhance accuracy, reading, and comprehension (Foorman et al., 2018; Moats, 2019).

In Reading.com, learners begin with a placement test assessed by the supervising adult which determines the learner's starting point. From this point on, the instruction in Reading.com is systematic and cumulative by following a set pattern of sequential modules in each lesson group. The modules include explicit instruction on phonemes, graphemes, morphemes and blending as well as orthography, when appropriate. The organization of learning material within each module progresses from basic (e.g. alphabet song) to complex (e.g. Sound Stories for pre-readers and books for readers). Prior research summarizing findings from 29 studies found that on average, digital books and features combined with adult scaffolding produced significant positive effects on language and literacy development, particularly vocabulary, when compared to traditional print book reading with adult support among learners aged 3-8 (Savva et al., 2022).

*Reading.com* supports the development of phonemic awareness, the learning of how sounds make words, by encouraging learners to pronounce letter sounds, connect them to individual letters with the help of a digital sound slider, practice short and long vowel sounds, and eventually move into blending sounds, supporting learners to read words mimicking the progression of traditional structured literacy curricula (Moats, 2019). As learners advance in their learning, they develop the



ability to read new and unfamiliar words correctly. Prior research suggests that phonological awareness, vocabulary, and letter knowledge are fundamental literacy skills that adults can support children in developing at each stage (Cavanaugh et al., 2017; Kuo, 2016).

Learners also practice letter recognition and letter tracing on their digital device within the relevant module per lesson. Prior research found a positive association between the frequency of writing with tablets and print awareness, print knowledge, and sound knowledge among children aged 2-4 years who used iPads at home with access to reading applications (Neumann, 2016). In another study that conducted an eight-week randomized control trial assigning 136 preschool and kindergarten learners into either a literacy-focused (experimental group) or a puzzle games (control group) condition found improvements in letter identification, letter-sound knowledge, rhyming, phonics, vocabulary, and sound awareness among those who used the literacy application, supporting the idea that key reading skills may be developed through the use of digital applications (Schmitt et al., 2018).

A study by Lane et al. (2009) evaluated the impact of a University of Florida Learning Initiative (UFLI) tutoring program with a structured curriculum for grade 1 learners. The experimental group was divided into one control condition (no tutoring) and four experimental conditions, each receiving slightly varied delivery of the UFLI program with intervention duration between 30 to 40 minutes. Specifically, the four tutoring conditions were (i) curriculum implemented in entirety, (ii) curriculum without the manipulative letter component, (iii) curriculum without the sentence writing strategy, and (iv) curriculum without the extending literacy component. Learners across tutoring conditions showed improvement in their phonological awareness and sight words as compared to the group with no tutoring. Learners who received the curriculum in its entirety performed significantly better than learners who did not receive tutoring in outcomes of phonological awareness, sight words, and decoding. Another study that varied implementation of structured curriculum in tutoring found that learners who were taught with the full implementation of curriculum lessons performed better than learners who interacted with partial or no implementation of the curriculum lessons (Ysseldyke et al., 2003). These studies suggest that having a structured curriculum associated with tutoring can increase the likelihood of tutoring effectiveness, even if implemented partially; thus providing the rationale behind having a structured curriculum.

## Hallmark 2: Explicit Direct Instruction with Spaced Review

Reading.com consists of 99 lessons in the curriculum, organized in order of increasing complexity, given frequency of occurrence. Each lesson has multiple modules that are gated to be completed in sequential order. These modules include a mix of direct explicit instruction, spaced review, and interactive, embedded practice. Explicit instruction means the supporting adult will teach and direct the content and not expect learners to learn simply from exposure or incidental instruction



(Archer & Hughes, 2011). Such approaches, including structured literacy instruction, feature a high-degree of adult-learner interaction with frequent responses from the learner, immediate and corrective feedback when necessary, and step-by-step demonstration.

Such pedagogy is implemented into the collection of modules that compose a Reading.com lesson, expected to take between 15-20 minutes per lesson and a maximum of one lesson per day, averaging 3-5 lessons a week. The dosage of Reading.com has not been empirically validated but mirror evidence from studies investigating dosage of structured curriculum. For instance, Sirinides et al. (2018) found that a structured reading recovery program was more effective than regular classroom instruction for first graders with a dosage implementation of five 30 minute sessions per week for 12 to 20 weeks. Another study by Mayfield (2000) looked at the impact of one-on-one instruction using the Edmark Reading program to teach literacy. The experimental group, who received 15 minutes of daily instruction, Monday through Friday, improved their comprehension skills more than the control group who read aloud for 15 minutes five days a week.

Reading.com has designed the learning experience such that learners review and practice their learned letters and high-utility words approximately 5-7 times through the 99 lessons with spacing. For instance, in the initial lessons, a learner starts with direct exposure with the alphabet song. Next, they proceed to complete a quick review of letters previously learned (including their short and long sounds) with the adult providing feedback. After completing the review, the learner proceeds to learn a new letter in the same way they learned previous letters (i.e. maintaining consistent learning sequence) modeled and directed by the adult. Then, the remaining modules may take the learner through listening for their new letter sound in a sound story, practice writing the letter, and practice reading words with any previously-learned letter. The goal behind such repeated practice is for learners to gain automaticity. Automaticity in the context of reading instruction refers to the point when a learner can read without intentional cognitive effort, freeing up cognitive resources to focus on comprehension and expression. The variability in the learning activity and the level of complexity allows learners to retrieve prior-learned letters in multiple formats, applying robust spaced retrieval practice increasing likelihood of improved performance (Latimier et al., 2020; Moreira et al., 2019; Agarwal et al., 2021).

### Hallmark 3: Supporting Intrinsic Motivation

*Reading.com* is an interactive and engaging application that encourages the development of learners' intrinsic motivation. When a learner is intrinsically motivated, they engage in an activity because they enjoy it, inherently rather than because there is an external consequence or outcome (Deci et al., 2013; Mouratidis & Michou, 2011). Intrinsic motivation is more strongly associated with reading achievement than extrinsic motivation (Schaffner et al., 2013; Wang et al., 2020). There are three critical elements to improving motivation of learners, namely autonomy, relatedness, and competence (Deci et al., 2013).





Reading.com encourages learners to take ownership of their learning, along with their adult, which can increase their feeling of autonomy. For instance, learners need to do the activities actively rather than observe or passively listen while their adult can encourage further autonomy through feedback and scaffolding (rather than prescriptive directions) which in turn can lead to greater motivation and achievement (Gonida & Cortina, 2014). Reading.com also speaks directly to the relatedness of the curricula for early readers. The scope and sequence of the lessons in the application are shaped by a combination of academic research on structured literacy curricula and market research on the highest utility letters and most frequently used letters and words. This informed decision-making process has crafted the sequence to encourage both relatedness and competence for young readers to learn short vowel sounds, consonants, to long and vowel blends both within and beyond the application. Further, although Reading.com offers “rewards”, these rewards are typically directly related to the learning activities or are a brief break such as a new e-book, or a game to practice the reading skill they learned, or to “scratch” the illustration of a page they just read.

In such ways, Reading.com applies design that has evidence of holding young learners’ curiosity, interest, and engagement supporting the development of their autonomy, relatedness, and competence (i.e. learners’ intrinsic motivation) and their reading proficiency, among both native and second language learners (Komiyama & McMorris, 2017). Further, continued engagement, by way of frequent reading, can improve learners’ reading skills as observed in a longitudinal study of fourth to sixth-grade learners (Becker et al., 2010). Researchers have found that when learners enjoy reading and are intrinsically motivated, they can comprehend, decode text, and have vocabulary knowledge. Thus, Reading.com is designed to increase intrinsic motivation and consequently reading proficiency.

## Hallmark 4: Intentional Multimedia Design

Reading.com, as a digital application, brings together multiple spheres of design: instructional, curriculum, learning, user, and multimedia design. Reading.com has applied key empirical findings in each design element. In this section we discuss the two avenues of multimedia design applied in this application:(a) within the lessons and (b) in the use of games for skill practice.

### *Multimedia design within the lessons*

Reading.com has intentionally designed their multimedia for engaged and effective learning. The administrative elements of the application, such as the lesson completion tracker (i.e. learning path) and bonus activities and games are designed to be attractive and interesting to young learners. For example, their learning path takes on a hero’s journey on a map toward triumph with every lesson showing a step toward that goal. However, when it comes to the multimedia design of content learning, such seductive details (i.e. interesting and irrelevant details; See Sundararajan,



2020 for a review) are excluded while retaining a clean and young visual interface. Further, the visual focus is centered on the letter; books are presented without visual cues; and simple signaling or interactivity reinforcing key ideas using multiple modalities (e.g. orthography, use of sound sliders) further align with recommended guidelines for the design of multimedia for learning purposes (See Noetel et al., 2022; Mayer, 2019).

#### *Multimedia design with the use of games for reading skill practice*

Reading.com includes games, printables, and decodable books as rewards for learners completing their lessons and gaining competence. These rewards are optional; i.e. they are “unlocked” and then available for learners to use when they decide to do so. Using games as a tool for learning languages, particularly English literacy, is well documented (Gee & Price, 2021; Leu et al., 2018; Shortt, 2023) and using game-like literacy apps has evidence of improving preschoolers’ emergent literacy skills (e.g. Arnold et al., 2021; Booton et al., 2023).

Reading.com currently has four digital games and five printable games that stretch practice across skills of letter recognition, letter-sound development, beginning, middle, and ending sounds, vocabulary, letter formation, spelling, phonemic awareness, phoneme isolation, digraphs, rhyming, word building, word blending, and sight word recognition. These games align with the learning goals and enable additional, optional, spaced practice of learned skills. They do not include complex game mechanics, ensuring that although engaging, learners continue to focus on the learning content. Hence, Reading.com uses games intentionally without creating additional cognitive load for learners.

## Hallmark 5: Adult Engagement Required

*Reading.com* uses a direct instruction method in which adults, whether they are parents, caregivers, tutors, or teachers, can read scripted instructions to explicitly teach learners to read. This approach is unique in two ways: (i) with instructions built into the app, the adult does not have to open another resource or prepare in advance to teach, and (ii) encourages parents, caregivers, or even elder siblings to support early readers in developing their reading abilities. In this section, we outline the evidence supporting adult engagement as a) caregivers and b) as tutors to explore the likelihood of impact in either scenario.

#### *Adults as Caregivers*

Research has shown that when families are involved in their children's learning, it can have a positive impact on their academic performance, motivation, and social-emotional development (Wilder, 2014). Caregivers can create a supportive environment, provide engaging experiences, and set achievable goals (Weiss et al., 2013, p. 18). Studies have highlighted the significance of parental involvement to support early learning and development outcomes with and without



technology (e.g. Kuo, 2016; Sung et al., 2023; Madigan et al., 2020). A readiness program aimed at preparing preschool children between the ages of 3 and 5 demonstrated that parental engagement in children's literacy learning was instrumental in their readiness for school. The treatment group, which participated in the program, showed a notable improvement in their children's language use ( $d = 1.11$ ), reading ( $d = 1.25$ ), and writing skills ( $d = 0.93$ ) compared to the control group who did not take part in the readiness program (Sheridan et al., 2011). This evidence provides support for the importance of parental involvement in children's learning, especially in the early stages, which is critical to early literacy development (Wilder, 2014). Family engagement is a shared responsibility among families, educators, and the community to support early learning through various formats such as one-on-one tutoring, library programs, and educational technology mediums (Lopez et al., 2017). With Reading.com, caregivers can potentially serve as 1:1 tutors for early reading.

#### *Adults as Tutors or Teachers*

Although Reading.com is not designed to be a tutoring tool per se, it may be adapted to serve as one. There is extensive empirical evidence supporting the likelihood of increased reading performance after tutoring. For instance, Markovitz et al (2014) evaluated the 1343 K-3 learners in the Americorps program who received literacy tutoring from paraprofessionals in group settings for 20 minutes, five days a week for 16 weeks and found statistically significant effects for learners in K-2. In their meta-analysis summarizing results from 74 empirical studies on literacy tutoring, Nickow et al. (2020) found that tutoring has a particularly strong effect on learning outcomes in preschool through Grade 1 with effect size ( $g$ ) ranging from 0.42 to 0.50 standard deviations as compared to moderate effects in grades 2 through 5 ( $g = 0.29$ ). In other words, tutoring in early grades for literacy may have a more pronounced impact on learners' reading ability.

At the same time, Michael (2019) presents evidence supporting the rationale that tutoring can positively influence both tutor and learner self-efficacy. In this study, 98 learners and 147 tutors both showed higher levels of academic and social self-efficacy at the end of 8 months of tutoring with the increased self-efficacy being positively associated with increased levels of future expectations. Reading.com mitigates the extent to which tutors require training, a key variable of influence in the effectiveness of instruction. Reading.com's approach of providing scripted instructions within the application mirrors efforts in empirical studies, wherein some programs provided tutors with the programs' guidelines to better prepare them to deliver lessons to learners. (e.g. Ysseldyke et al., 2003; Parker et al., 2019; Gersten et al., 2015; Jacob et al., 2016; Lane et al., 2009; Mayfield, 2000; Smith et al., 2013). In this way, Reading.com may support both improved reading achievement and adult self-efficacy to support learner reading by providing scripted instructions encouraging adult engagement.



## Part 3: Future Research Agenda

At the time of engagement with EdTech Recharge, Reading.com has continued plans of building evidence of effectiveness. In 2024-25, Reading.com intends to pursue a well-designed and executed independent quasi-experimental efficacy evaluation examining the extent to which the theory of change results in intended outcomes to meet requirements of ESSA Tier II. For a successful study, the independent researcher and Reading.com will consider all components of the logic model presented in Figure 1. Particularly, they will consider:

- **School sites and sample:** Multiple school sites within the same public school district will be recruited to minimize contextual differences.
- **Research Design:** A between-group quasi experimental study will be attempted to clearly investigate the effect of using Reading.com with the experimental group using the application as a supplemental tool and the control group receiving instruction as usual for a period of at least 12 consecutive weeks and ideally completing the curriculum.
- **Measurement:** Rigorous measurement of early literacy skills will be captured using standardized measures at pre- and post-test. Additionally, demographic data and implementation fidelity information will be collected. Surveys will be administered to collect additional learner- and adult-related outcomes.
- **Implementation fidelity:** EdTech Recharge recommends that the independent researcher also execute a plan to monitor implementation fidelity. This will include the testing of assumptions and monitoring of external factors listed in the logic model with key findings modeled into the analysis plan, if and as necessary.
- **Analysis plan:** Given the quasi-experimental between group study design, the analysis plan will include descriptive statistics and inferential statistics (such as ANOVA and hierarchical linear models) as necessary after testing required assumptions. Key outcomes will be early reading skills and motivation to read. Additional post-hoc exploratory analyses may be conducted to test the evidence-based theory of change and implementation.

## Conclusion

This report presents empirical evidence demonstrating the rationale for potential efficacy of Reading.com to improve ELA outcomes, particularly reading, of US public school K-2 learners. This rationale is presented in the theory of change logic model which guides the design of future intended efficacy study. Till the time the key inputs, activities, and assumptions remain as presented in the logic model, Reading.com meets the requirements of evidence of efficacy at an ESSA Tier IV level. For questions, email Dr. Kripa Sundar ([team@edtechrecharge.com](mailto:team@edtechrecharge.com))



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