

Reading Accelerator

Logic Model

Study Type: ESSA Evidence Level IV

Prepared for:
EPS Learning

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EXECUTIVE SUMMARY

EPS Learning (EPS) engaged LearnPlatform by Instructure (LearnPlatform), a third-party edtech research company, to develop a logic model for *Reading Accelerator*. LearnPlatform designed the logic model to satisfy Level IV requirements (*Demonstrates a Rationale*) according to the Every Student Succeeds Act (ESSA).¹

Logic Model

A logic model provides a program roadmap, detailing program inputs, participants reached, program activities, outputs, and outcomes. LearnPlatform collaborated with EPS to develop and revise the logic model.

Study Design for *Reading Accelerator* Evaluation

Informed by the *Reading Accelerator* logic model, LearnPlatform developed a research plan for a study to meet ESSA Level III requirements. The proposed research questions are as follows:

Implementation questions

1. To what extent will students use *Reading Accelerator* during the 2024–25 school year?
 - a. How many active minutes will students spend on *Reading Accelerator*?
 - b. How many active sessions will students complete on *Reading Accelerator*?

Outcome questions

2. To what extent will students' engagement with *Reading Accelerator*—measured by active minutes and active sessions—relate to their performance on end-of-year standardized reading assessments?

Conclusions

This study satisfies ESSA evidence requirements for Level IV (*Demonstrates a Rationale*). Specifically, this study met the following criteria for Level IV:

- ✓ Detailed logic model informed by previous, high-quality research
- ✓ Study planning and design is currently underway for an ESSA Level I, II or III study

¹ Level IV indicates that an intervention should include a “well-specified logic model that is informed by research or an evaluation that suggests how the intervention is likely to improve relevant outcomes; and an effort to study the effects of the intervention, that will happen as part of the intervention or is underway elsewhere...” (p. 9, U.S. Department of Education, 2016).

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Introduction

EPS Learning (EPS) engaged LearnPlatform by Instructure (LearnPlatform), a third-party edtech research company, to develop a logic model for *Reading Accelerator*. LearnPlatform designed the logic model to satisfy Level IV requirements (*Demonstrates a Rationale*) according to the Every Student Succeeds Act (ESSA).

The study had the following objectives:

1. Define the *Reading Accelerator* logic model and foundational research base.
2. Draft an ESSA Level III study design.

Previous Research. *Reading Accelerator* is grounded on research on: 1.) the science of reading (including Scarborough's Reading Rope and structured literacy); 2.) blended learning models; 3.) teaching literacy to older striving readers; 4.) educational technology and digital learning; 5.) artificial intelligence (AI) in education; 6.) formative assessments and progress monitoring; and 7.) culturally responsive teaching. Additional information on the research underlying the program can be found in Appendix A.

1.) Science of Reading. The science of reading is a body of research developed over decades that explains how people learn to read and write. Included in this research is an emphasis on explicit, systematic teaching of essential skills (National Reading Panel, 2000). EPS builds this approach into *Reading Accelerator* in two primary ways: Scarborough's Reading Rope and structured literacy approaches.

- **Scarborough's Reading Rope.** The Reading Rope illustrates the complex interplay of skills needed for proficient reading (including word recognition and language comprehension; Scarborough, 2001). Early reading development can be critical for academic success. Chall et al. (1996) highlight a stage-based model of reading, where low-income students often struggle during the transition from "learning to read" to "reading to learn," particularly around 4th grade, due to vocabulary limitations and reduced fluency. Decoding skills are a foundational component of fluency. This refers to the ability to translate written symbols (letters and letter patterns) into their corresponding sounds to read words correctly and is fundamental to early reading development. Older students often struggle with reading comprehension without explicit and systematic instruction in foundational literacy skills, particularly decoding (Kilpatrick, 2015). When readers can decode words accurately and efficiently, they can allocate more cognitive resources to comprehension. This leads to smoother, more expressive reading, which is a hallmark of fluency (Wang et al., 2019).

Early intervention is crucial as reading gaps widen over time. There is a critical level of decoding skill necessary for students to effectively comprehend text. Once students reach this threshold, their reading comprehension improves significantly. However, students who fall below this threshold struggle with comprehension and may experience limited growth, even with additional instruction (Wang et al., 2019). Daniel et al. (2022) show that baseline

word reading skills significantly predict students' response to multicomponent reading interventions (MCRIs), with those having lower initial skills showing poorer reading comprehension outcomes. This has sometimes been referred to as the Matthew Effect (named after a bible verse) and refers to the phenomenon where early success in reading leads to further success, while early difficulties lead to further struggles. This is because strong readers tend to read more, which exposes them to a wider vocabulary, more complex sentence structures, and deeper understanding of text. As they read more, their reading skills improve, creating a positive feedback loop (Pfof et al., 2014). Research shows that adolescents who are provided with opportunities for deep, reflective thinking, can positively improve their neural development and overall well-being over time (Gotlieb et al., 2024). *Reading Accelerator* is designed to provide fast-paced, whole-class instruction that accelerates the mastery of essential reading skills at scale, with the goal of ensuring all students reach the critical decoding threshold within a year.

- **Structured literacy.** *Reading Accelerator* is also guided by research on the five core components of reading instruction: phonemic awareness, phonics, fluency, vocabulary, and comprehension (National Reading Panel, 2000; Seidenberg, 2017). *Reading Accelerator* incorporates structured literacy approaches, supported by research on the importance of explicit instruction in phonemic awareness and phonics (Moats, 2020; Fletcher et al., 2018). This approach ensures that students, particularly those struggling with foundational skills, receive structured support to bridge gaps in their reading abilities. Research on how phonological processing and orthographic mapping (Rayner et al., 2001) contribute to reading proficiency, guides the development of instructional strategies within the program that enhance phonemic decoding skills and reading fluency.

2.) Blended learning models. Research highlights how combining face-to-face and online learning environments fosters more flexible, personalized educational experiences (Graham, 2006). *Reading Accelerator* integrates both teacher-led instruction and digital tools like *Reading Assistant*, which uses voice-recognition technology to provide students with tailored, adaptive reading practice, feedback, and interventions.² By leveraging Graham's insights, the program aims to ensure that students benefit from a cohesive learning environment where traditional and digital strategies complement each other, creating a balanced learning ecosystem that supports student engagement and scalable instruction.

3.) Teaching literacy to older striving readers. *Reading Accelerator* incorporates complex texts and comprehension activities tailored to older readers, ensuring that lessons are both developmentally appropriate and engaging. This approach is grounded on research outlining the instructional challenges and strategies suited for middle and high school students which emphasize stimulating and challenging content (Biancarosa & Snow, 2004). In addition, Fisher and Frey's (2021) Gradual Release of Responsibility model promotes a scaffolded approach, gradually

² The AI powered *EPS Reading Assistant* enhances any reading curriculum or intervention program by utilizing voice-recognition technology. It offers independent, one-on-one adaptive reading practice and intervention with real-time feedback, helping to accelerate the development of reading skills.

moving students from guided instruction to independent literacy tasks, which aligns with the program's goal of reinforcing literacy skills over time and further guides its lesson structures. Research underlines the importance of phonemic awareness and decoding strategies for older readers (Kilpatrick, 2015). In addition, *Reading Accelerator's* intensive, multi-sensory, and explicit reading intervention strategies are aligned with research on how to meet the literacy needs of students with dyslexia and older striving readers (Torgesen, 2005).

4.) *Educational technology and digital learning.* Research emphasizes the importance of reducing cognitive load through coherent and concise instructional content (Mayer, 2014). By incorporating text, audio, and visual aids, *Reading Accelerator* aims to ensure that digital content enhances learning rather than overwhelms students. Studies recommend that effective digital learning design should be adapted to fit the cognitive needs of middle and high school students, ensuring that it provides a balanced experience (Clark & Mayer, 2023). It should also include features that allow for peer interactions and data-driven instruction in literacy tasks (Roschelle et al., 2000). *Reading Accelerator* supports deep, reflective thinking and knowledge construction through reading and writing activities within its digital learning environments, influenced by the concept of knowledge building found in Scardamalia's work (2006).

5.) *AI in education.* Research on AI in education (Luckin, 2018; Kulik & Fletcher, 2016) informs the adaptive, data-driven tools in *Reading Accelerator*, particularly through its AI-driven *Reading Assistant*, which combines human teaching strategies with AI-driven feedback mechanisms. Heffernan and Heffernan (2014) emphasize the balance between AI interventions and teacher decision-making, a principle integrated into *Reading Accelerator's* design, ensuring that teachers can make data-informed decisions on group instruction. The program is influenced by Sweller's (1988) emphasis on the importance of balancing the complexity of reading tasks with supportive tools that enhance learning without overburdening students' cognitive capacities as well as VanLehn's (2006) findings on how effective feedback systems should shape instructional design, reducing cognitive overload while addressing learning obstacles. Additionally, insights from Shute & Zapata-Rivera (2012) and Alevin et al. (2004) contribute to the platform's ability to foster self-regulation and adaptive learning, ensuring interventions are targeted and effective for older striving readers.

6.) *Formative assessments and progress monitoring.* Research on feedback and formative assessments significantly shapes the instructional design of *Reading Accelerator*. Hattie and Timperley's (2007) research emphasizes the importance of guiding students toward deeper understanding and self-correction, which directly informs the feedback mechanisms embedded in *Reading Assistant*. This ensures that feedback is not only corrective but also developmental. Additionally, research on formative assessments (Andrade et al., 2019) underpins the program's adaptive learning framework, enabling teachers to adjust instructional content and pacing based on student groups, ensuring targeted and effective instruction for older striving readers.

7.) *Culturally responsive teaching.* Culturally responsive teaching principles are central to *Reading Accelerator's* approach, ensuring that educators can effectively support diverse learners.

Alexander's (2016) "warm demander" approach (i.e., an educator who combines high expectations with high support) informs teacher training, combining high expectations with high support, especially for students who have faced educational neglect. Delpit (2020) emphasizes the importance of setting high expectations and using culturally relevant scaffolding, guiding *Reading Accelerator* to include rigorous, culturally aligned content that resonates with marginalized students. Ladson-Billings (1995) and Gay (2018) further inspire the integration of instructional materials that reflect students' cultural backgrounds, promoting engagement and affirming identities. Finally, Paris and Alim's (2017) concept of culturally sustaining pedagogies encourages the preservation of students' linguistic and cultural practices, driving the development of lesson materials that validate and celebrate students' diverse experiences.

By incorporating elements of these diverse domains, *Reading Accelerator* creates a holistic, research-driven framework that fosters personalized, adaptive, and inclusive learning environments. This multidisciplinary approach aims to ensure that instructional strategies are evidence-based, technologically enhanced, and culturally relevant, providing comprehensive support to both educators and students and it has the potential to lead to improved literacy outcomes for all students.

Logic Model

A logic model is a program or product roadmap. It identifies how a program aims to impact learners, translating inputs into measurable activities that lead to expected results. A logic model has five core components: inputs, participants, activities, outputs, and outcomes (see Table 1).

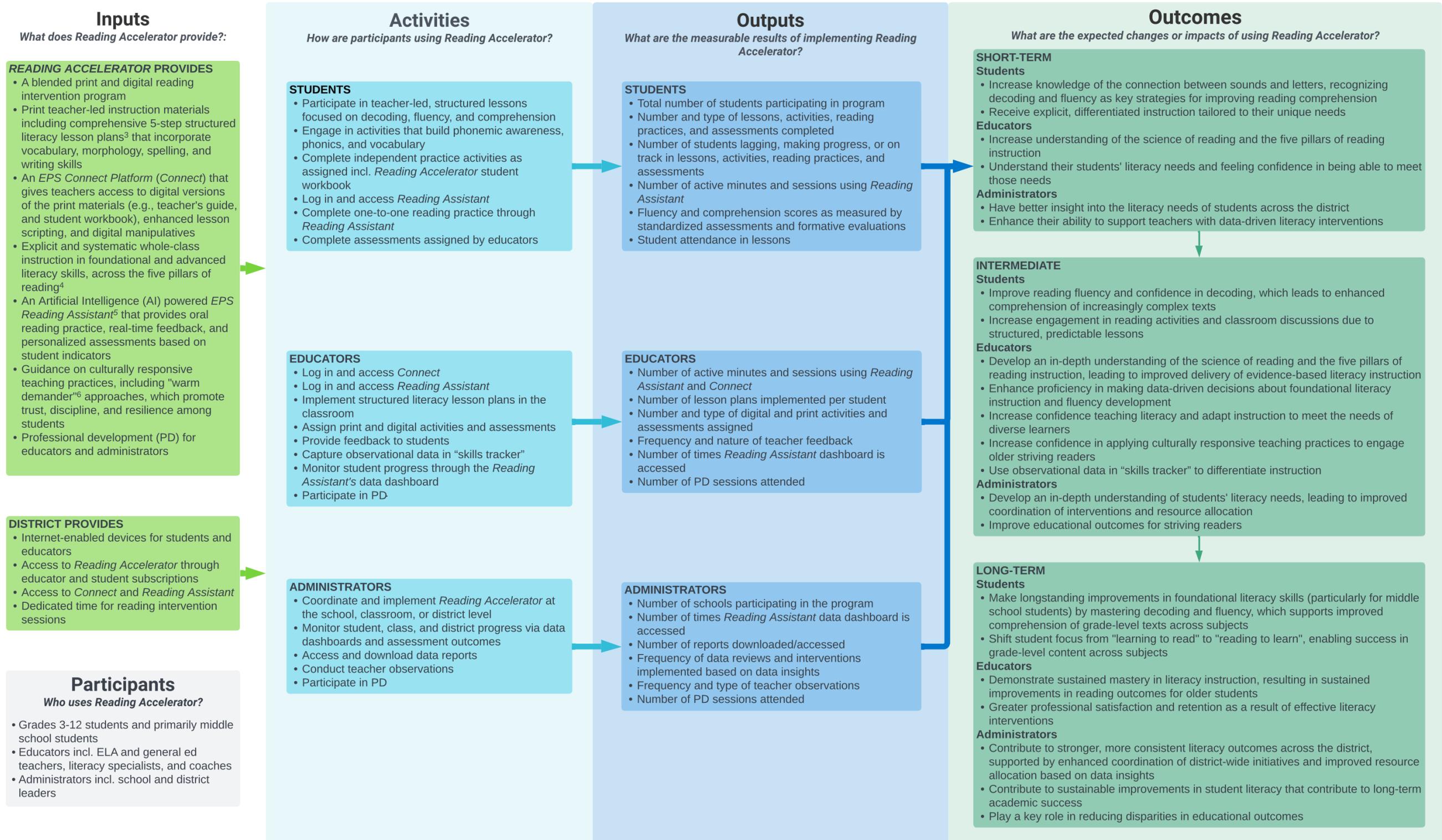
Table 1. Logic model core components

Component	Description	More information
Inputs	What the provider invests	What resources are invested and/or required for the learning solution to function effectively in real schools?
Participants	Who the provider reaches	Who receives the learning solution or intervention? Who are the key users?
Activities	What participants do	What do participants do with the resources identified in Inputs? What are the core/essential components of the learning solution? What is being delivered to help students/teachers achieve the program outcomes identified?
Outputs	Products of activities	What are numeric indicators of activities? (e.g., key performance indicators; allows for examining program implementation)
Outcomes	Short-term, intermediate, long-term	Short-term outcomes are changes in awareness, knowledge, skills, attitudes, and aspirations. Intermediate outcomes are changes in behaviors or actions. Long-term outcomes are ultimate impacts or changes in social, economic, civil or environmental conditions.

LearnPlatform reviewed *Reading Accelerator* resources, artifacts, and program materials to develop a draft logic model. EPS reviewed the draft and provided revisions during virtual meetings. The final logic model depicted below (Figure 1) reflects these conversations and revisions.



Problem Statement: Older students often struggle with reading comprehension without explicit and systematic instruction in foundational literacy skills, particularly decoding.¹ This leads to academic underachievement, decreased graduation rates, and lifelong negative impacts on literacy. Due to the large number of older students in need of reading interventions, *EPS Reading Accelerator* is based on the science of reading² and is designed to provide fast-paced, whole-class instruction that accelerates the mastery of essential reading skills at scale, with the goal of ensuring all students reach the critical decoding threshold within a year.



DISTRICT PROVIDES

- Internet-enabled devices for students and educators
- Access to *Reading Accelerator* through educator and student subscriptions
- Access to *Connect* and *Reading Assistant*
- Dedicated time for reading intervention sessions

Participants

Who uses Reading Accelerator?

- Grades 3-12 students and primarily middle school students
- Educators incl. ELA and general ed teachers, literacy specialists, and coaches
- Administrators incl. school and district leaders

¹ Decoding refers to the ability to translate written symbols (letters and letter patterns) into their corresponding sounds to read words correctly. This process is fundamental to early reading development (Kilpatrick, 2015). Children who read below this "decoding threshold" have been shown to experience almost no growth in reading comprehension (Wang et al., 2019).

² The Science of Reading is a research-based approach to literacy instruction that focuses on how the brain learns to read, emphasizing explicit, systematic teaching of essential skills (National Reading Panel, 2000).

³ The teacher's guide features simple 20-minute structured literacy lesson plans, organized into five steps: Sound Round, Rapid Round, Break and Build, Push a Pencil, and Time for Texts.

⁴ The five pillars of reading—phonemic awareness, phonics, fluency, vocabulary, and comprehension—are the key components that support the development of proficient reading (National Reading Panel, 2000).

⁵ The AI powered *EPS Reading Assistant* enhances any reading curriculum or intervention program by utilizing voice-recognition technology. It offers independent, one-on-one adaptive reading practice and intervention with real-time feedback, helping to accelerate the development of reading skills.

⁶ A "warm demander" is an educator who builds strong, trusting relationships with students while maintaining high expectations for their academic performance and behavior. This approach combines warmth, care, and respect with firm, clear expectations, encouraging students to rise to challenges in a supportive environment. Warm demanders promote resilience, discipline, and growth by balancing nurturing interactions with rigorous academic demands, especially for students who thrive with culturally responsive teaching (Delpit, 1995; Ladson-Billings, 1994).

Note. References to in-text citations are listed in the ESSA Level IV report for Reading Accelerator.

Reading Accelerator Logic Model Components. EPS invests several resources into its platform, including:

- A blended print and digital reading intervention program;
- Print teacher-led instruction materials including comprehensive five-step structured literacy lesson plans³ that incorporate vocabulary, morphology, spelling, and writing skills;
- EPS *Connect*; a platform that gives teachers access to digital versions of the print materials (e.g., teacher's guide, and student workbook), enhanced lesson scripting, and digital manipulatives;
- Explicit and systematic whole-class instruction in foundational and advanced literacy skills, across the five pillars of reading;⁴
- An Artificial Intelligence (AI) powered EPS *Reading Assistant*⁵ that provides oral reading practice, real-time feedback, and personalized assessments based on student indicators;
- Guidance on culturally responsive teaching practices, including "warm demander"⁶ approaches, which promote trust, discipline, and resilience among students; and
- Professional development (PD) for educators and administrators.

School districts would be expected to provide:

- Internet-enabled devices for students and educators;
- Access to *Reading Accelerator* through educator and student subscriptions;
- Access to *Connect* and *Reading Assistant*; and
- Dedicated time for reading intervention sessions.

Ultimately, *Reading Accelerator* aims to reach students in 3rd–12th grade, primarily middle school students, as well as educators (including ELA and general education teachers, literacy specialists, and coaches), and administrators (including school and district leaders).

³ The teacher's guide features simple 20-minute structured literacy lesson plans, organized into five steps: Sound Round, Rapid Round, Break and Build, Push a Pencil, and Time for Texts.

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Using these program resources, the aforementioned participants can engage with *Reading Accelerator* in the following activities:

Students:

- Participate in teacher-led, structured lessons focused on decoding, fluency, and comprehension;
- Engage in activities that build phonemic awareness, phonics, and vocabulary;
- Complete independent practice activities as assigned including *Reading Accelerator* student workbook;
- Log in and access *Reading Assistant*;
- Complete one-to-one reading practice through *Reading Assistant*; and
- Complete assessments assigned by educators.

Educators:

- Log in and access *Connect*;
- Log in and access *Reading Assistant*;
- Implement structured literacy lesson plans in the classroom;
- Assign print and digital activities and assessments;
- Provide feedback to students;
- Capture observational data in “skills tracker;”
- Monitor student progress through the *Reading Assistant*’s data dashboard; and
- Participate in PD.

Administrators:

- Coordinate and implement *Reading Accelerator* at the school, classroom, or district level;
- Monitor student, class, and district progress via data dashboards and assessment outcomes;
- Access and download data reports;
- Conduct teacher observations; and
- Participate in PD.

EPS can examine the extent to which core activities were delivered and participants were reached by examining the following quantifiable outputs:

Students

- Total number of students participating in the program
- Number and type of lessons, activities, reading practices, and assessments completed
- Number of students lagging, making progress, or on track in lessons, activities, reading practices, and assessments
- Number of active minutes and sessions using *Reading Assistant*
- Fluency and comprehension scores as measured by standardized assessments and formative evaluations
- Student attendance in lessons

Educators

- Number of active minutes and sessions using *Reading Assistant* and *Connect*
- Number of lesson plans implemented per student
- Number and type of digital and print activities and assessments assigned
- Frequency and nature of teacher feedback
- Number of times *Reading Assistant* dashboard is accessed
- Number of PD sessions attended

Administrators

- Number of schools participating in the program
- Number of times *Reading Assistant* data dashboard is accessed
- Number of reports downloaded/accessed
- Frequency of data reviews and interventions implemented based on data insights
- Frequency and type of teacher observations
- Number of PD sessions attended

If implementation is successful, based on a review of program outputs, EPS can expect the following short-term outcomes.

In the short term, students will increase their knowledge of the connection between sounds and letters, recognizing decoding and fluency as key strategies for improving reading comprehension. They will receive explicit, differentiated instruction tailored to their unique needs. Educators will increase their understanding of the science of reading and the five pillars of reading instruction. They will also understand their students' literacy needs and feel confidence in being able to meet those needs. Administrators will have better insights into the literacy needs of students across the district and enhance their ability to support teachers with data-driven literacy interventions.

In the intermediate term, students will improve their reading fluency and confidence in decoding, which will lead to enhanced comprehension of increasingly complex texts. They will also increase their engagement in reading activities and classroom discussions due to structured, predictable lessons. Educators will develop an in-depth understanding of the science of reading and the five pillars of reading instruction, leading to improved delivery of evidence-based literacy instruction. They will also enhance proficiency in making data-driven decisions about foundational literacy instruction and fluency development. Educators will increase their confidence in teaching literacy. They will adapt instruction to meet the needs of diverse learners and apply culturally responsive teaching practices to engage older striving readers. Finally, they will use observational data in "skills tracker" to differentiate instruction. Administrators will develop an in-depth understanding of students' literacy needs, leading to improved coordination of interventions and resource allocation. They will also improve educational outcomes for striving readers.

In the long term, students will make longstanding improvements in foundational literacy skills (particularly for middle school students) by mastering decoding and fluency, which will support improved comprehension of grade-level texts across subjects. They will also shift student focus from “learning to read” to “reading to learn,” enabling success in grade-level content across subjects. Educators will demonstrate sustained mastery in literacy instruction, resulting in sustained improvements in reading outcomes for older students. They will also gain greater professional satisfaction and retention as a result of effective literacy interventions. Administrators will contribute to stronger, more consistent literacy outcomes across the district, supported by enhanced coordination of district-wide initiatives and improved resource allocation based on data insights. They will also contribute to sustainable improvements in student literacy that contribute to long-term academic success. Finally, they will play a key role in reducing disparities in educational outcomes.

Study Design for *Reading Accelerator* Evaluation

To continue building evidence of effectiveness and to examine the proposed relationships in the logic model, EPS has plans to conduct an evaluation to determine the extent to which *Reading Accelerator* produces the desired outcomes. Specifically, EPS has plans to begin an ESSA Level III study to answer the following research questions:

Implementation questions

1. To what extent will students use *Reading Accelerator* during the 2024–25 school year?
 - a. How many active minutes will students spend on *Reading Accelerator*?
 - b. How many active sessions will students complete on *Reading Accelerator*?

Outcome questions

2. To what extent will students' engagement with *Reading Accelerator*—measured by active minutes and active sessions—relate to their performance on end-of-year standardized reading assessments?

Conclusions

This study satisfies ESSA evidence requirements for Level IV (*Demonstrates a Rationale*). Specifically, this study met the following criteria for Level IV:

- ✓ Detailed logic model informed by previous, high-quality research
- ✓ Study planning and design is currently underway for an ESSA Level I, II or III study

Appendix A: Annotated Bibliography for Reading Accelerator

The following annotated bibliography demonstrates the research underlying the *Reading Accelerator* program, including how EPS leveraged this research to come to design decisions about their program.

Content Area 1: Science of reading

Citation	Citation type	Sample and study relevance	Design decisions Driven by the research	How did EPS leverage the citation to come to this design decision
Chall, J., Jacobs, V., & Baldwin, L. (1996). Reading, writing, and language connection. In J. Shimron (Ed.), <i>Literacy and education: Essays in memory of Dina Feitelson</i> (pp. 33–48). Hampton Press.	Theoretical research	This study highlights the transition from "learning to read" to "reading to learn," especially for low-income students, focusing on vocabulary limitations and reduced fluency.	<i>Reading Accelerator</i> was designed to address the literacy challenges that arise when students move from learning to read to reading to learn, particularly around 4th grade, providing targeted interventions to prevent widening reading gaps.	Chall et al. emphasize the need for early intervention as reading gaps widen over time, which informs <i>Reading Accelerator's</i> focus on foundational reading skills to ensure all students reach the decoding threshold necessary for reading comprehension success.
Daniel, J., Vaughn, S., Roberts, G., & Grills, A. (2022). The importance of baseline word reading skills in examining student response to a multicomponent reading intervention. <i>Journal of Learning Disabilities, 55</i> (4), 259–271.	Empirical study	The study evaluates whether students' baseline word reading skills predict their response to a multicomponent reading intervention (MCRI). Data from a randomized controlled trial for 3rd and 4th grade students with reading difficulties ($n = 128$) were analyzed.	<i>Reading Accelerator</i> includes strategies for assessing baseline word reading skills to tailor interventions based on initial skill levels, ensuring that students with lower initial word reading skills receive targeted support for reading comprehension.	Daniel et al. show that baseline word reading skills significantly predict students' responses to MCRI. This informs <i>Reading Accelerator's</i> focus on early assessment and targeted intervention for students with lower initial skills to enhance their reading outcomes.

<p>Fletcher, J. M., Lyon, G. R., Fuchs, L. S., & Barnes, M. A. (2018). <i>Learning disabilities: From identification to intervention</i>. Guilford Publications.</p>	<p>Book</p>	<p>While focused on students with learning disabilities, the principles outlined are applicable to all students, especially striving readers.</p>	<p><i>Reading Accelerator</i> includes robust mechanisms for identifying reading difficulties early in the program and applying structured, research-based interventions tailored to individual needs.</p>	<p>The structured approach to identifying and addressing learning disabilities outlined by Fletcher and colleagues guides <i>Reading Accelerator's</i> strategies for screening and supporting students with diverse reading abilities.</p>
<p>Gotlieb, R. J. M., Yang, X. F., & Immordino-Yang, M. H. (2024). Diverse adolescents' transcendent thinking predicts young adult psychosocial outcomes via brain network development. <i>Scientific Reports</i>, 14, 6254.</p>	<p>Empirical study</p>	<p>The study followed a group of 65 teenagers, aged 14 to 18, over a period of 5 years. These teenagers were from diverse backgrounds, considering factors like IQ, ethnicity, and socioeconomic status.</p>	<p>Adolescents who are provided with opportunities for deep, reflective thinking, can positively improve their neural development and overall well-being over time</p>	<p>Early intervention is crucial as reading gaps widen over time. <i>Reading Accelerator</i> provides instruction and supports with the goal of ensuring all students reach the critical decoding threshold within a year, allowing more students to read more and develop a deeper understanding of text.</p>
<p>Moats, L. C. (2020). <i>Speech to Print: Language Essentials for Teachers</i>. Brookes Publishing.</p>	<p>Book</p>	<p>While primarily aimed at educators, the strategies discussed are applicable to students from elementary through high school.</p>	<p><i>Reading Accelerator</i> includes comprehensive lesson plans that incorporate a systematic approach to teaching literacy including phonics and language structures.</p>	<p>Moats' work emphasizes the importance of explicit instruction in phonics and language structures, which informs <i>Reading Accelerator's</i> curriculum development to systematically include detailed phonics instruction and language concepts.</p>

<p>National Reading Panel (US), National Institute of Child Health, & Human Development (US). (2000). <i>Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups</i>. National Institute of Child Health and Human Development, National Institutes of Health.</p>	<p>Meta-analysis</p>	<p>This report combines findings from research studies (over 100,000 studies between 1966 and 2000) across various age groups and educational settings, primarily focusing on K–12 students.</p>	<p><i>Reading Accelerator</i> includes a balanced reading curriculum that integrates all five components of reading instruction, ensuring that each aspect of reading is systematically taught and reinforced.</p>	<p>The National Reading Panel report is one of the seminal works that defined the five components of reading instruction. It provides a comprehensive review of research evidence supporting the effectiveness of teaching phonemic awareness, phonics, fluency, vocabulary, and comprehension and informs <i>Reading Accelerator's</i> structured literacy approach.</p>
<p>Pfost, M., Hattie, J., Dörfler, T., & Artelt, C. (2014). Individual differences in reading development: A review of 25 Years of empirical research on Matthew Effects in reading. <i>Review of Educational Research</i>, 84(2), 203–244.</p>	<p>Meta-analysis</p>	<p>28 studies reporting 78 distinct results were included. These studies included those conducted in the US and abroad; approximately half of the samples were English-speaking.</p>	<p>Reading skills, participant characteristics, and measurement properties influence the pattern of reading development. The Matthew Effect (widening differences over time) was more likely for measures of decoding speed and efficiency.</p>	<p>Early intervention is crucial as reading gaps widen over time. <i>Reading Accelerator</i> provides instruction and supports with the goal of ensuring all students reach the critical decoding threshold within a year.</p>
<p>Rayner, K., Foorman, B. R., Perfetti, C. A., Pesetsky, D., & Seidenberg, M. S. (2001). How psychological science informs the teaching of reading. <i>Psychological science in the public interest</i>, 2(2), 31–74.</p>	<p>Theoretical research</p>	<p>Reviews studies across various educational levels, primarily focusing on K–12. Its principles are highly relevant for designing instruction for older struggling readers.</p>	<p><i>Reading Accelerator</i> structures its phonics and fluency components to ensure that instruction is grounded in cognitive science principles that support effective reading growth.</p>	<p>The insights on how phonological processing and orthographic mapping contribute to reading proficiency guides the development of instructional strategies that enhance phonemic decoding skills and reading fluency.</p>

<p>Scarborough, H. S. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory and practice. In S. B. Neuman & D. K. Dickinson (Eds.), <i>Handbook of early literacy research</i> (pp. 97–110). Guilford Press.</p>	<p>Theoretical research</p>	<p>This work presents the framework of Scarborough’s Reading Rope, illustrating how word recognition and language comprehension work together for skilled reading.</p>	<p><i>Reading Accelerator</i> uses Scarborough’s Reading Rope to guide its instructional strategies by focusing on both word recognition and language comprehension to develop proficient readers.</p>	<p>Scarborough’s Reading Rope framework informs the balanced approach in <i>Reading Accelerator</i>, integrating both word recognition skills (like decoding) and language comprehension, ensuring older struggling readers receive explicit, systematic instruction in all aspects of reading.</p>
<p>Seidenberg, M. (2017). <i>Language at the speed of sight: How we read, Why so many can’t, and what can be done about it</i>. Basic Books.</p>	<p>Book</p>	<p>Seidenberg’s work, though broad in its scope, discussing cognitive science and psychology, is crucial for developing instructional content that is cognitively aligned with how students learn to read, including those in middle and high school.</p>	<p><i>Reading Accelerator</i> designed instructional content that aligns with scientific understanding of reading processes, ensuring that the <i>Reading Accelerator</i> effectively supports the development of reading fluency.</p>	<p>Seidenberg’s discussion on the Science of Reading informs <i>Reading Accelerator’s</i> approach to integrating cognitive and developmental principles into reading instruction.</p>
<p>Wang, Z., Sabatini, J., O’Reilly, T., & Weeks, J. (2019). Decoding and reading comprehension: A test of the decoding threshold hypothesis. <i>Journal of Educational Psychology</i>, 111(3), 387.</p>	<p>Empirical study</p>	<p>(Study 1) 11,765 students from Grade 5–12; (Study 2) 34,016 students from grade 5–9. All came from one public school district in a mid-sized city located on the east coast of the USA.</p>	<p><i>Reading Accelerator</i> focuses on giving extra, clear instruction in decoding for students who need help with basic reading skills, so they can eventually tackle harder texts.</p>	<p>Understanding the decoding threshold helps Reading Accelerator tailor interventions for older students who may still be struggling with basic decoding skills, ensuring that these foundational skills are addressed to facilitate better comprehension.</p>

Content Area 2: Blending learning models

Citation	Citation type	Sample and study relevance	Design decisions Driven by the research	How did EPS leverage the citation to come to this design decision
<p>Graham, C. R. (2006). Blended learning systems. <i>The handbook of blended learning: Global perspectives, local designs</i>, 1, 3–21.</p>	<p>Theoretical research</p>	<p>No sample included. Provides a comprehensive overview of blended learning models and their impact on educational outcomes</p>	<p>Teachers have access to both print and digital materials through <i>Connect</i> and students have access to whole-class instruction and <i>Reading Assistant</i>, contributing to a blended learning environment by combining teacher-led instruction with digital support.</p>	<p>The research in this domain emphasized the idea that integrating digital and traditional learning environments creates a cohesive instructional experience. These blended models support engagement, individualized learning, and the scalability of interventions.</p>

Content Area 3: Teaching literacy to older striving readers

Citation	Citation type	Sample and study relevance	Design decisions Driven by the research	How did EPS leverage the citation to come to this design decision
<p>Biancarosa, G., & Snow, C. E. (2004). <i>Reading next: A vision for action and research in middle and high school literacy: A report from Carnegie Corporation of New York</i>. Alliance for Excellent Education.</p>	<p>Theoretical research</p>	<p>The instructional strategies are particularly applicable to middle and high school students</p>	<p><i>Reading Accelerator</i> incorporates diverse texts and complex comprehension activities geared towards older students.</p>	<p>The <i>Reading Next</i> report makes detailed recommendations for instructional strategies and content selection that are both engaging and appropriately challenging for older students, which influenced <i>Reading Accelerators'</i> curriculum development.</p>
<p>Fisher, D., & Frey, N. (2021). <i>Better learning through structured teaching: A framework for the gradual release of responsibility</i>. ASCD.</p>	<p>Theoretical research</p>	<p>Although it encompasses a broad range of grade levels, the instructional strategies are particularly applicable to middle and high school students</p>	<p>The Gradual Release of Responsibility model highlighted by Fisher and Frey supports <i>Reading Accelerator's</i> lesson design.</p>	<p><i>Reading Accelerator</i> is designed to gradually move students from whole-class teacher directed lessons to independent reading tasks, by ensuring that each lesson incorporates guided practice followed by independent activities, reinforcing literacy skills in a scaffolded manner</p>

<p>Kilpatrick, D. A. (2015). <i>Essentials of assessing, preventing, and overcoming reading difficulties</i>. John Wiley & Sons.</p>	<p>Theoretical research</p>	<p>This text combines research findings applicable across diverse educational settings and age groups, including older students.</p>	<p><i>Reading Accelerator's</i> curriculum includes intensive phonics and decoding instruction.</p>	<p>Kilpatrick emphasizes the critical need for phonemic awareness and advanced decoding strategies even in older readers which justifies the inclusion of systematic phonics instruction within <i>Reading Accelerator's</i> curriculum, ensuring that it covers both foundational and advanced decoding skills essential for older readers.</p>
<p>Moats, L. C. (2020). <i>Speech to Print: Language Essentials for Teachers</i>. Brookes Publishing.</p>	<p>Theoretical research</p>	<p>While primarily aimed at educators, the strategies discussed are applicable to students from elementary through high school, making it relevant for middle and high school students who are part of <i>Reading Accelerator's</i> target demographic.</p>	<p><i>Reading Accelerator</i> includes structured literacy approaches tailored to older students who need explicit instruction in phonemic awareness and phonics.</p>	<p>Moats' focus on explicit instruction in phonemic awareness and phonics influenced and the detailed approach to teaching speech-to-print skills inspired specific instructional strategies in <i>Reading Accelerator</i>, such as direct instruction in sound-letter correspondences and systematic spelling instruction.</p>

<p>Torgesen, J. K. (2005). Recent discoveries from research on remedial interventions for children with dyslexia. <i>The science of reading</i>, 521–537.</p>	<p>Meta-analysis</p>	<p>The study focuses on children with dyslexia. However, the principles derived from intensive interventions can also be applied to any older students struggling with reading, which aligns with the population targeted by <i>Reading Accelerator</i>.</p>	<p><i>Reading Accelerator</i> includes direct-instruction and interventions that are intensive, multi-sensory, and accommodating to students with dyslexia as well as older striving readers.</p>	<p>Torgesen's demonstration of the effectiveness of specific intervention strategies shaped <i>Reading Accelerator's</i> program structure and components, ensuring they are intensive, multi-sensory, and explicit, in order to meet the needs of students with dyslexia and older striving readers.</p>
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Content Area 4: Educational technology and digital learning

Citation	Citation type	Sample and study relevance	Design decisions Driven by the research	How did EPS leverage the citation to come to this design decision
<p>Mayer, R. E. (2014). Incorporating motivation into multimedia learning. <i>Learning and instruction, 29</i>, 171–173.</p>	<p>Theoretical research</p>	<p>Mayer's research predominantly involves college students, but the principles of multimedia learning he outlines are applicable across educational settings, including K-12, making them relevant for the <i>Reading Accelerator's</i> target demographic.</p>	<p>Embedded multi-media content such as instructional videos, interactive reading activities that integrate text, audio, and visual aids</p>	<p>Mayer's principles, such as the coherence, redundancy, and contiguity principles, guides the creation of multimedia content within the <i>Reading Accelerator</i>, ensuring that digital materials are designed to enhance understanding without overwhelming the students.</p>
<p>Clark, R. C., & Mayer, R. E. (2023). <i>E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning</i>. John Wiley & Sons.</p>	<p>Book</p>	<p>This book combines findings from research from various educational levels but primarily focuses on adult learners. However, the principles derived are broadly applicable to younger learners, particularly in structured learning environments like those the <i>Reading Accelerator</i> aims to create.</p>	<p><i>Reading Accelerator</i> curriculum content</p>	<p>The evidence-based recommendations for designing e-learning experiences provided by Clark and Mayer influence the development of <i>Reading Accelerator</i> curriculum content that is interactive, engaging, and tailored to the cognitive needs of middle and high school students.</p>

<p>Roschelle, J. M., Pea, R. D., Hoadley, C. M., Gordin, D. N., & Means, B. M. (2000). Changing how and what children learn in school with computer-based technologies. <i>The future of Children</i>, 76–101.</p>	<p>Empirical study</p>	<p>The study includes primary and secondary school students, closely aligning with the <i>Reading Accelerator's</i> intended audience.</p>	<p>The program incorporates tools that facilitate data-driven instruction.</p>	<p>Insights from Roschelle and colleagues are used to enhance the social learning aspects of the <i>Reading Accelerator</i>, integrating features that allow for peer interactions and data-driven instruction in literacy tasks.</p>
<p>Scardamalia, M. (2006). Knowledge building: Theory, pedagogy, and technology.</p>	<p>Book chapter</p>	<p>Primarily relevant to elementary school contexts but the knowledge-building principles discussed are applicable to older students, too.</p>	<p>The program incorporates digital tools that facilitate knowledge construction through reading and writing activities.</p>	<p>The concept of knowledge building articulated by Scardamalia and Bereiter influenced the design of digital learning environments within <i>Reading Accelerator</i> that support deep, reflective thinking and knowledge construction through reading and writing activities.</p>

Content Area 5: AI in education

Citation	Citation type	Sample and study relevance	Design decisions Driven by the research	How did EPS leverage the citation to come to this design decision
<p>Aleven, V., McLaren, B., Roll, I., & Koedinger, K. (2004). Toward tutoring help seeking: Applying cognitive modeling to meta-cognitive skills. In <i>Intelligent Tutoring Systems: 7th International Conference, ITS 2004, Maceió, Alagoas, Brazil, August 30-September 3, 2004. Proceedings 7</i> (pp. 227–239). Springer Berlin Heidelberg.</p>	<p>Conference presentation</p>	<p>Conducted with middle and high school students using an intelligent tutoring system, directly applicable to the <i>Reading Accelerator's</i> target group.</p>	<p>Integrated mechanisms in <i>Reading Accelerator</i> that encourage effective help-seeking and self-regulated learning among students.</p>	<p>This study is used to design aspects of <i>Reading Accelerator</i> that prompt students to engage with instructional material actively and request help when necessary, thereby fostering a more supportive and interactive learning environment.</p>
<p>Luckin, R. (2018). <i>Machine Learning and Human Intelligence: The future of education for the 21st century</i>. UCL IOE Press. UCL Institute of Education, University of London</p>	<p>Book</p>	<p>This book addresses a general audience and does not specify a particular sample of students, making its findings applicable across educational settings and age groups.</p>	<p><i>Reading Assistant</i> is an AI-driven tool that provides personalized feedback and tutoring.</p>	<p>This book discusses the integration of machine learning and human intelligence in educational contexts. The design team used this resource to justify and guide the integration of AI within <i>Reading Accelerator</i>, particularly in developing components that combine human teaching strategies with AI-driven feedback mechanisms to enhance literacy learning in older striving readers.</p>

<p>Kulik, J. A., & Fletcher, J. D. (2016). Effectiveness of intelligent tutoring systems: a meta-analytic review. <i>Review of educational research</i>, 86(1), 42–78.</p>	<p>Meta-analysis</p>	<p>This review describes a meta-analysis of findings from 50 controlled evaluations of intelligent computer tutoring systems. The studies reviewed primarily involve K-12 students and is directly applicable to the <i>Reading Accelerator's</i> target demographic of older striving readers.</p>	<p><i>Reading Assistant</i> is an AI-driven tool that provides personalized feedback and tutoring.</p>	<p>Kulik's findings that intelligent tutoring systems can effectively improve academic performance is critical in shaping how <i>Reading Accelerator</i> incorporates AI to tailor reading interventions, ensuring that AI components adapt to students' individual learning progress and needs.</p>
<p>Heffernan, N. T., & Heffernan, C. L. (2014). The ASSISTments ecosystem: Building a platform that brings scientists and teachers together for minimally invasive research on human learning and teaching. <i>International Journal of Artificial Intelligence in Education</i>, 24, 470–497.</p>	<p>Theoretical research</p>	<p>This study specifically focuses on the ASSISTments platform used in middle schools, closely aligning with the <i>Reading Accelerator's</i> focus on older striving readers.</p>	<p><i>Reading Accelerator</i> gives teachers the flexibility to use Connet, their technology platform and <i>Reading Assistant</i>, the AI-driven platform while ensuring that the teacher is the ultimate driver in decision-making for their student growth.</p>	<p>Insights from the Heffernans' work guides <i>Reading Accelerator</i> in establishing a seamless link between instructional content, student performance data, and AI-driven interventions, thereby fostering a more dynamic and responsive learning environment, ensuring that the teacher is making data-informed decisions.</p>

<p>Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. <i>Cognitive science</i>, 12(2), 257–285.</p>	<p>Empirical study</p>	<p>The original studies by Sweller were conducted with various groups, often in controlled environments like laboratories. While these might not directly correlate with the diverse classroom settings of <i>Reading Accelerator</i>, the principles derived are universally applicable to educational design.</p>	<p>Interactive, multi-sensory tools, and multi-media content that supports reading instruction.</p>	<p><i>Reading Accelerator</i> uses Sweller’s principles to optimize instructional design by balancing the complexity of reading tasks with supportive tools that enhance learning without overburdening the students’ cognitive capacities.</p>
<p>Shute, V. J., & Zapata-Rivera, D. (2012). Adaptive educational systems. <i>Adaptive technologies for training and education</i>, 7(27), 1–35.</p>	<p>Empirical study</p>	<p>The research often focuses on broad educational settings, including K–12 students, which aligns well with the <i>Reading Accelerator</i>’s target demographic of middle and high school students.</p>	<p>Tailored instruction based on students’ performance metrics the AI-driven <i>Reading Assistant</i> platform.</p>	<p><i>Reading Accelerator</i> uses insights from Shute and Zapata-Rivera to enhance the AI components of <i>Reading Assistant</i>, ensuring they dynamically adjust learning paths and content delivery to match individual student needs, optimizing learning outcomes.</p>
<p>VanLehn, K. (2006). The behavior of tutoring systems. <i>International journal of artificial intelligence in education</i>, 16(3), 227–265.</p>	<p>Empirical study</p>	<p>The study involves secondary school and college students, making the findings relevant for the <i>Reading Accelerator</i>’s intended audience.</p>	<p><i>Reading Assistant</i>’s feedback mechanism.</p>	<p>The program uses VanLehn’s findings to refine the feedback mechanisms within <i>Reading Assistant</i>, ensuring they are effective at identifying and addressing learning obstacles without causing frustration or disengagement.</p>

Content Area 6: Formative assessments and progress monitoring

Citation	Citation type	Sample and study relevance	Design decisions Driven by the research	How did EPS leverage the citation to come to this design decision
<p>Hattie, T. (2007). Hattie, J., Timperley H. The Power of Feedback. <i>Review of Educational Research</i>, 77(1), 81–112.</p>	<p>Meta-analysis</p>	<p>Although Hattie and Timperley review studies across various age groups and educational settings, the principles of effective feedback they outline are universally applicable, including to the older student populations in the <i>Reading Accelerator</i>.</p>	<p>Feedback mechanism embedded in <i>Reading Assistant</i>.</p>	<p>Insights from this study guides how feedback is structured within the <i>Reading Accelerator's</i> tools, such as <i>Reading Assistant</i>, ensuring that feedback not only addresses errors but also guides students towards deeper understanding and self-correction.</p>
<p>Andrade, H. L., Bennett, R. E., & Cizek, G. J. (Eds.). (2019). <i>Handbook of formative assessment in the disciplines</i>. Routledge.</p>	<p>Theoretical research</p>	<p>The handbook includes studies and practical examples from K–12 education, directly relevant to the <i>Reading Accelerator's</i> focus on older striving readers.</p>	<p><i>Reading Accelerator</i> utilizes formative assessments to continually adjust instructional content and pacing.</p>	<p>Leverages the diverse approaches and strategies discussed in the handbook to implement a multifaceted formative assessment framework that supports adaptive learning and personalized instruction.</p>

Content Area 7: Culturally responsive teaching

Citation	Citation type	Sample and study relevance	Design decisions Driven by the research	How did EPS leverage the citation to come to this design decision
<p>Alexander, M. (2016). The warm demander: An equity approach. <i>George Lucas Educational Foundation</i>.</p>	<p>Theoretical research</p>	<p>General educational audience, with principles applicable across K–12 settings.</p>	<p><i>Reading Accelerator</i> has adopted this approach in its training programs for educators, ensuring that teachers are prepared to effectively support all students through demanding yet supportive educational practices.</p>	<p>The concept of the “warm demander” —an educator who combines high expectations with high support —informs the development of teaching practices that are both challenging and nurturing, particularly for students who may have experienced educational neglect or low expectations.</p>
<p>Delpit, L. (2020). <i>“Multiplication is for white people”: Raising expectations for other people’s children</i>. The New Press.</p>	<p>Theoretical research</p>	<p>Delpit’s work primarily addresses the challenges faced by African American and other marginalized students in K–12 education, aligning closely with <i>Reading Accelerator’s</i> focus on serving disenfranchised and striving readers in middle school.</p>	<p><i>Reading Accelerator</i> incorporates culturally relevant texts and examples into lessons, ensuring that content resonates with students from diverse backgrounds. Additionally, teacher training could emphasize Delpit’s ideas on setting high expectations and scaffolding to build student confidence.</p>	<p>Delpit’s work on raising expectations for marginalized students inspire <i>Reading Accelerator</i> to include high-level, rigorous content that challenges students while being culturally relevant and engaging. Additionally, the program emphasizes the importance of culturally responsive teaching strategies in its professional development for teachers.</p>

<p>Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. <i>American educational research journal</i>, 32(3), 465-491.</p>	<p>Theoretical research</p>	<p>Ladson-Billings' research was conducted with African American students and their teachers in elementary and middle schools, making it directly relevant to the middle school-aged population that the <i>Reading Accelerator</i> targets.</p>	<p><i>Reading Accelerators'</i> instructional content and activities reflect students' cultural backgrounds and lived experiences. Lessons incorporate texts, themes, and examples that reflect a diverse range of cultural perspectives and experiences.</p>	<p><i>Reading Accelerator</i> includes lesson materials that celebrate and reflect students' cultures and experiences, thereby fostering greater student engagement and ownership of their learning. It might also inform teacher training to ensure teachers are equipped to teach in ways that are culturally responsive and affirming.</p>
<p>Gay, G. (2018). <i>Culturally responsive teaching: Theory, research, and practice</i>. Teachers College Press.</p>	<p>Book</p>	<p>Gay's work combines findings from research across various educational settings, focusing primarily on K-12 students of color. This broad scope makes it directly relevant to the diverse middle students served by the <i>Reading Accelerator</i>.</p>	<p><i>Reading Accelerator</i> incorporates instructional materials that reflect cultural diversity and actively engage students by linking academic content to cultural knowledge and experiences.</p>	<p>This book guides the selection of culturally inclusive texts and activities, ensuring that the program reflects diverse perspectives. Additionally, teacher professional development might be informed by Gay's strategies to build culturally responsive classroom environments.</p>

<p>Paris, D., & Alim, H. S. (Eds.). (2017). <i>Culturally sustaining pedagogies: Teaching and learning for justice in a changing world</i>. Teachers College Press.</p>	<p>Theoretical research</p>	<p>Students from diverse cultural and linguistic backgrounds, including African American, Latinx, and immigrant students, making it highly relevant to the populations served by <i>Reading Accelerator</i>.</p>	<p>The concept of culturally sustaining pedagogies encourages the preservation and promotion of students' cultural and linguistic practices. <i>Reading Accelerator</i> incorporates activities and texts that reflect and celebrate students' home languages and cultures, promoting bilingualism and cultural pride.</p>	<p>This research is used to develop lesson materials and activities that sustain students' cultural identities while promoting academic growth. This could include integrating texts in both English and students' home languages or culturally relevant themes that validate students' experiences.</p>
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