

Microsoft Reading Progress & Reading Coach Logic Model

Study Type: ESSA Evidence Level IV

Prepared for:
Microsoft

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EXECUTIVE SUMMARY

Microsoft engaged LearnPlatform, a third-party edtech research company, to develop a logic model for Reading Progress and Reading Coach. 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 Microsoft to develop and revise the logic model.

Study Design for Reading Progress and Reading Coach Evaluation

Informed by the logic model, the next phase will focus on planning for an ESSA Level I, II, or III study to examine the extent to which Reading Progress and Reading Coach impacts students' oral reading fluency.

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 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

Microsoft engaged LearnPlatform, a third-party edtech research company, to develop a logic model for Reading Progress and Reading Coach. LearnPlatform designed the logic model to satisfy Level IV requirements (*Demonstrates a Rationale*) according to the Every Student Succeeds Act (ESSA).

Microsoft's Reading Progress and Reading Coach support reading fluency instruction for students and educators. Navigating the time constraints imposed by traditional one-on-one fluency assessments while managing a class full of students with diverse needs, including English language learners and students with disabilities, is a persistent challenge for educators. Reading Progress and Reading Coach save teachers time and energy through automated asynchronous fluency assessment data collection, AI-assisted data analysis, and on-demand education insights that help visualize class and student-level performance and growth. This allows educators to spend less time conducting fluency assessments, and gives students greater opportunity to develop the reading skills they will need.

The study had the following objectives:

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

Previous Research. Reading is a critical life skill that students develop in K-12 education. Oral reading fluency (ORF) is one key aspect of reading that includes reading speed, word-reading accuracy, as well as reading with expression, or prosody. ORF scores help teachers determine how to differentiate reading instruction for each student. Students' oral reading guided practice and ORF assessments are traditionally done one-on-one and are time consuming for teachers to implement.

In response, educational researchers have developed technology to automate the guided reading and assessment process (e.g., Bolaños & colleagues, 2011; Bernstein & colleagues, 2020; Mostow & Duong, 2009). Literacy-focused technologies support teachers in the classroom, promote student learning, and produce greater achievement outcomes in reading (Mostow, Nelson-Taylor, & Beck, 2013). Many of these technologies, including Microsoft's Reading Progress and Reading Coach, have integrated artificial intelligence (AI) to analyze students' oral reading fluency (e.g., Bernstein et al, 2020; Mostow & Duong, 2009).

One strategy to increase students' oral reading fluency is to practice reading (National Reading Panel, 2000). The addition of AI enhances the ability to analyze students' reading of ORF indicators, such as words read per minute, word-reading accuracy, and expression. This results in teachers spending less time implementing assessments and analyzing results, and more time differentiating instruction for students' varied abilities. Mostow and colleagues (2013) evaluated the efficacy of computer guided oral reading versus independent practice. They found that

students who used computer guided oral reading made significantly higher gains in their reading ability than peers practicing independently. The growth measured was similar to growth expected from students immersed in human-guided oral reading. AI makes comprehensive oral reading guidance and assessment available to all students without the time and resource constraints teachers traditionally encounter when trying to meet students' reading needs.

Table 1. Oral fluency and literacy supports embedded in Reading Progress and Reading Coach

Component	Research Basis	References
Speed	Students who read slowly tend to focus their efforts at the word recognition level, making it difficult for them to attend to meaning. On the other hand, reading too quickly can cause learners to disregard punctuation, which also negatively impacts fluency. Oral reading at the appropriate speed reflects automaticity of word recognition that allows readers to focus more attention on comprehending the text.	Kim, Wagner, & Foster, 2011; Rasinski, Rikli & Johnston, 2009; Sabatini et al., 2019
Accuracy	Reading accuracy is strongly associated with comprehension. Students need access to specific supports to improve their pronunciation accuracy and automaticity. For example, oral fluency interventions that provide a model (e.g., sample pronunciation audio in Reading Progress and Reading Coach) are more consistently associated with improved skills than those that do not.	Kim, Wagner, & Foster, 2011; Sabatini et al., 2019; Wexler et al., 2007
Prosody	Fluent reading is characterized by speech at an appropriate rate that conveys meaning through prosodic elements like phrasing, stress, and expression. Prosody is less commonly assessed (compared to accuracy and speed) despite its importance in the development of fluency and comprehension due to the subtlety of its development in readers. Prosody has also been identified as a predictor of student engagement and motivation to read.	Morrow & Asbury, 2003; Rasinski, Rikli & Johnston, 2009
Vocabulary	As students are exposed to language and build up the store of words they recognize and understand, they can leverage their vocabulary to engage with more challenging, unfamiliar texts and learn even more vocabulary words. Resources embedded in Reading Progress and Reading Coach like pronunciation audio, syllabification, and the picture dictionary help students develop the vocabulary necessary for fluent reading.	Coyne, et al., 2019; Wexler et al., 2007
Comprehension	Reading comprehension is a key aspect of reading that facilitates learning academic content. Reading speed and accuracy are correlated with student performance on comprehension assessments. Furthermore, oral fluency scores in middle school are associated with reading comprehension scores in high school. ORF is a critical stepping stone towards reading comprehension and skills mastery.	Kim, Wagner, & Foster, 2011; Paige et al., 2012; Sabatini et al., 2019; Wolf & Katzner-Cohen, 2001

One strategy to increase students’ oral reading fluency is to practice reading (National Reading Panel, 2000). The addition of AI enhances the ability to analyze students’ reading of ORF indicators, such as words read per minute, word-reading accuracy, and expression. This results in teachers spending less time implementing assessments and analyzing results, and more time differentiating instruction for students’ varied abilities. Mostow and colleagues (2013) evaluated the efficacy of computer guided oral reading versus independent practice. They found that students who used computer guided oral reading made significantly higher gains in their reading ability than peers practicing independently. The growth measured was similar to growth expected from students immersed in human-guided oral reading. AI makes comprehensive oral reading guidance and assessment available to all students without the time and resource constraints teachers traditionally encounter when trying to meet students’ reading needs.

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	<p>Short-term outcomes are changes in awareness, knowledge, skills, attitudes, and aspirations.</p> <p>Intermediate outcomes are changes in behaviors or actions.</p> <p>Long-term outcomes are ultimate impacts or changes in social, economic, civil or environmental conditions.</p>

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

Reading Progress and Reading Coach Logic Model Components. Microsoft invests several resources into their program. This includes the Reading Progress virtual reading fluency assessment that students complete in class or asynchronously outside of school. The assessment's Auto-Detect feature identifies different types of reading errors to determine overall oral reading fluency in terms of speed, accuracy, and prosody. The AI-assisted evaluation of oral reading fluency includes multiple language options and pronunciation sensitivity. The Education Insights data dashboard and reporting feature gives users access to student' fluency data. Another resource provided is the sample library of reading passages, licensed through ReadWorks and available in multiple languages. Reading Coach provides personalized review activities including sample pronunciation audio, stretching words into syllables, pictures of word meaning, and comprehension questions. Reading Progress and Reading Coach must be implemented using internet enabled devices with audio/video recording functionality. Ultimately, Reading Progress and Reading Coach are intended for K-12 Students and Teachers, as well as other educators like Reading Specialists, Curriculum Leaders, Media Specialists and Librarians, and School or District Administrators.

Using these program resources, students and educators can engage with Reading Progress and Reading Coach in the following activities:

- Students record audio and/or video of themselves reading when and where they feel most comfortable.
- Students upload oral reading samples for automatic assignment review.
- Students complete automatically presented extra practice for words they struggled with.
- Teachers select reading passages from the sample library or import their own passages.
- Teachers identify their desired passage settings.
- Teachers review assignments to assess student fluency.
- Teachers use the insights dashboard to monitor student progress.
- Teachers create follow-up challenge assignments based on student performance.
- Specialists collaborate with educators to select interventions and identify instructional materials.

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

- Number of student reading samples uploaded.
- Number of assignments students complete.
- Number of challenge assignments students complete.
- Number of comprehension questions students answer.
- Number of minutes using Reading Coach.
- Number of assignments created by teachers.
- Number of assignments administered by teachers.
- Ratio of imported passages to selections from sample library used.
- Number of educator & administrator minutes on Education Insights dashboard.

If implementation is successful, based on a review of program outputs, Microsoft can expect the following short-term outcomes. Students will have more opportunities for intentional practice in a familiar application when and where they choose. Students will also be able to access instant support for native and non-native languages. In the short-term, teachers and specialists will have access to real-time data about their students' reading fluency, increasing their capacity for meeting individual student learning needs. Likewise, school and district leaders will be able to access automated insights about usage and performance across their classrooms and schools.

With continued implementation, students will become more independent and confident in their oral reading fluency in the intermediate term. Students will also feel an increased sense of agency in their learning as they develop and improve literacy skills in native and non-native languages. During this time it is also expected that educators will use student performance data to inform instruction, while school and district leaders use data to identify appropriate supports and interventions.

The intended long-term outcomes consist of student performance improving on the oral reading fluency assessment , which leads to improved reading comprehension and overall proficiency improvements. If long-term implementation is successful, then school and district leaders will be able to align their resources with needs and integrate literacy support across content areas, while teachers are better able to tailor their instructional agenda to meet their students' literacy needs. Ultimately, if these outcomes can be achieved, it is expected to translate into improvement in student achievement across content areas through improved literacy skills.

Study Design for Reading Progress and Reading Coach Evaluation

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

- 1) How much time did students spend practicing ORF?
- 2) How many fluency assessments did students complete?
- 3) How many fluency assessments did educators assign and review?
- 4) Was use of Reading Progress and Reading Coach associated with improved student literacy outcomes?

Microsoft plans to begin this study in 2023.

Conclusions

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

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