Digital Promise Global

Partnerships that Work:

Tapping Research to Address Learner Variability in Young Readers

Medha Tare, PhD | Susanne Nobles, PhD | Wendy Xiao, MA

Introduction

Over the past several decades, the student population in the United States has grown more diverse by factors including race, socioeconomic status, primary language spoken at home, and learning differences (Digital Promise Global, 2017). At the same time, learning sciences research has advanced our understanding of learner variability and the importance of grounding educational practice and policy in the individual, rather than the fiction of an average student (Pape & Vander Ark, 2018; Rose, 2016).

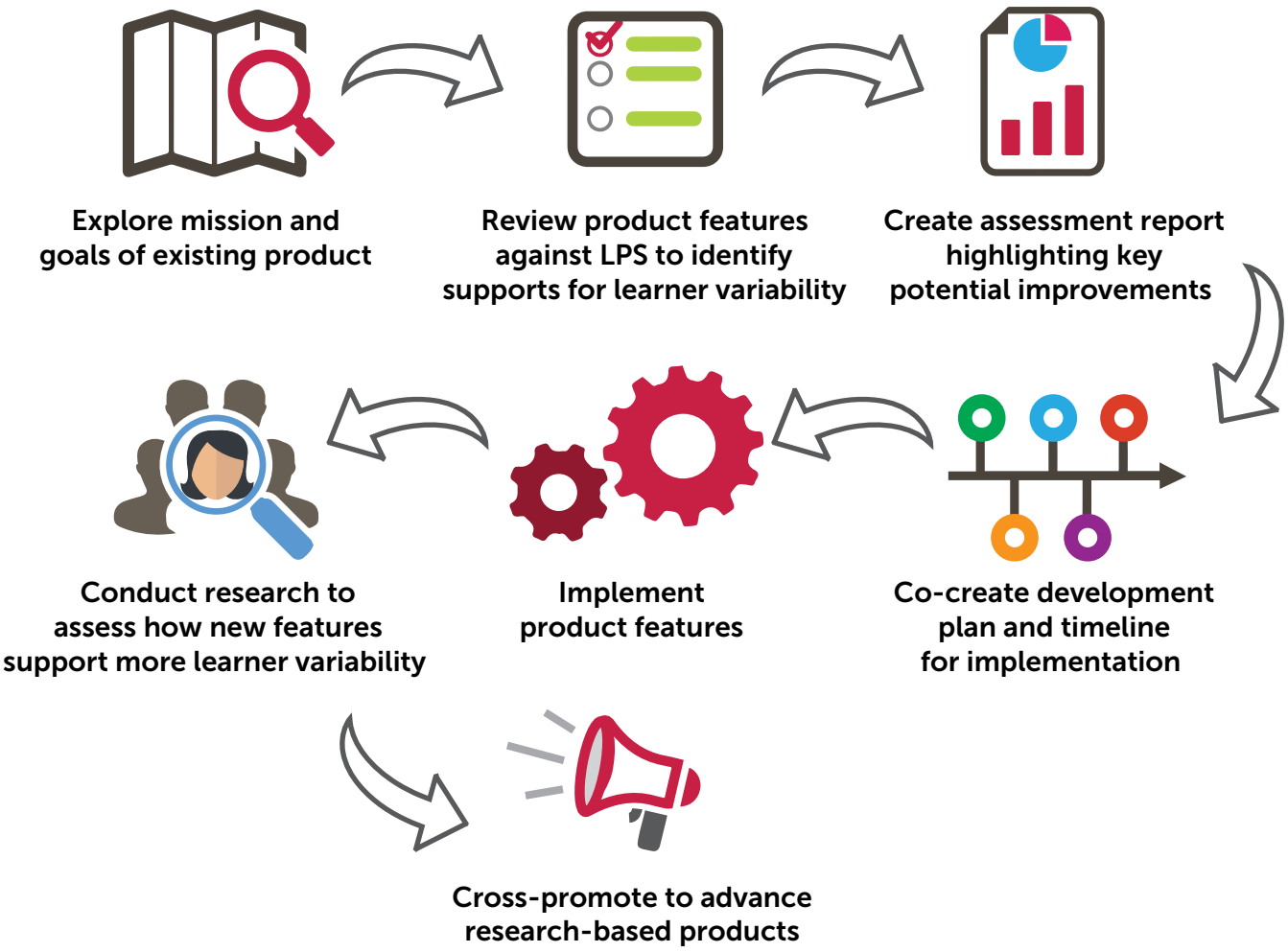
Innovations in technology have also moved us closer to realizing the promise of evidence-based personalization. Yet, analyses show that over 70 percent of the most popular literacy apps do not make any reference to learning sciences research, and there is a need for researchers to translate their work into actionable recommendations for educators, parents, and edtech product developers (Vaala, Ly, & Levine, 2015).

To address this gap, the Learner Positioning Systems (LPS) initiative at Digital Promise Global (DPG) distills existing research on cognitive, social and emotional, content area, and background Learner Factors that affect learning in various domains, such as reading and math. **Our LPS web application provides free, interactive resources that present educators and developers with ways to more fully understand and support learner variability in their schools, classrooms, and products.**

Partnering with Edtech Developers

One of the first goals of the LPS initiative is to increase awareness and understanding of learner variability so that edtech developers can ground their products in the learning sciences and use evidence-based strategies to more fully support all learners. Improving widely used products amplifies the potential impact on millions of students who have varying needs, particularly if teachers are able to easily take advantage of these increased learner supports.

LPS's partnerships with developers involve a collaborative process:



For our first set of partnerships, we specifically sought products focused on readers in pre-kindergarten through third grade to leverage the research in our first Learner Model, Reading PK-3 (Sheppard, 2017). In seeking partners, LPS also values organizations committed to reaching learners from a variety of backgrounds and with varying needs.

Our first partner, ReadWorks, is a nonprofit organization that aims to leverage learning sciences research in support of its mission to address national gaps in student reading achievement (NAEP, 2015). ReadWorks provides free resources to K-12 teachers, including a library of curated nonfiction and literary articles, reading comprehension and vocabulary curricular supports, assessments, and teacher resources.

When ReadWorks partnered with us in 2017, their resources were being used in over 61,000 public K-8 schools in the United States. As of January 2018, ReadWorks had 3.2 million students and 143,000 teachers actively using their digital products. Almost one-third of ReadWorks' participating schools are in the top quartile for the number of students receiving free or reduced-price lunch. Their site is one of the top online resources consulted for instruction by English Language Arts teachers (Opfer, Kaufman & Thompson, 2017).

ReadWorks sought a partnership with us as they developed their first digital platform for students. ReadWorks' goal for seeking a partnership grant was to infuse the latest research on learner variability into their platform design to better support the full diversity of learners.

As a first step, we extensively reviewed ReadWorks' product to create a draft assessment report of how ReadWorks could design its platform to further support learner variability. This report included recommendations of factors and strategies from the LPS Reading PK-3 model to potentially develop as features. The report was finalized with both LPS and ReadWorks teams working together to create a development plan and timeline that aligned with our shared goal of increasing support for learner variability and ReadWorks' current product roadmap. As part of this finalized report, the teams categorized the potential product features into short-, mid-, and long-term phases of development.

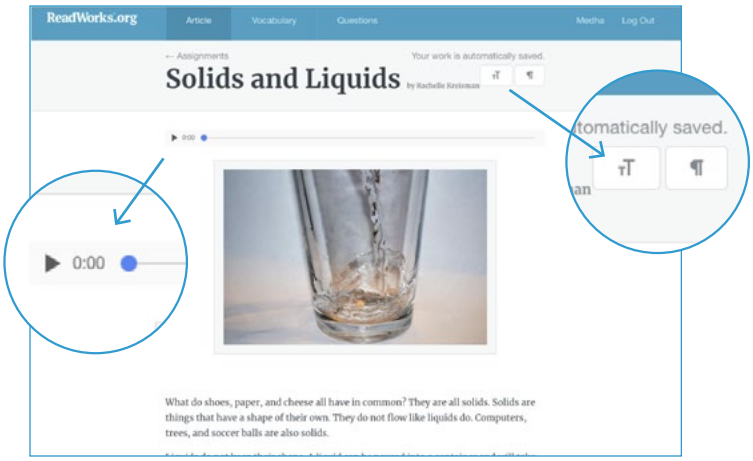
Reaching Each Learner by Connecting Research to Practice

A short-term development recommendation was to add audio supports, either human voice or text-to-speech, to all of the articles so students could have the option to listen to the text.

This strategy supports eleven key Learner Factors in the Reading PK-3 model, including Inhibition, Working Memory, Decoding, and Primary Language. Adding audio supports also has been shown to improve student outcomes and attitudes toward reading. In a study of fourth- and fifth-graders who struggle with reading, joining an audiobook club through their school library was found to improve their standardized reading test scores over the previous school year. Further, almost all of the students identified themselves as "good readers" at the end of the study (Whittingham, Huffman, Christensen, & McAllister, 2013). They all reported that they would participate in an audiobook club again, and parents reported that their children had increased confidence when reading.

ReadWorks already had human voice audio available on some of their articles, along with plans to incorporate audio into their fully-illustrated eBooks. These existing features and development plans combined with the promising cognitive and affective benefits of audio made this recommendation a priority for implementation.

Another set of suggested features for short-term development were student choice capabilities. Student choice is one of the key drivers of Emotion and Motivation (APA, 2017). We felt the ReadWorks platform was primed for increasing positive student emotions and, as a result, motivation because the platform already provided such a variety of article topics that interest students. Adding features that allow students to adjust their viewing pane (e.g., adding paragraph numbers) and interact with the articles (e.g., highlighting and annotations) would deepen ReadWorks' support of these factors.



Screenshot of ReadWorks' student activity, which highlights new features including audio options (text-to-speech or human voice) and display options (text magnifier and paragraph numbering).

LPS-based student choice features also included adding a text magnifier for students who need supports for Vision and Attention. ReadWorks' text magnification tool allows students three font size options that they can toggle through. Research with children in first to fourth grade suggests that children with dyslexia need larger fonts to support their maximum reading speed than children without dyslexia (O'Brien, Mansfield, & Legge, 2005). Thus, offering a text magnifier option allows flexibility to address more learners' needs.

Teachers React to LPS-Based Improvements

In conjunction with the development process, LPS researchers worked with ReadWorks to design studies to assess the impact of the newly implemented features on learner outcomes.

As part of the first stage of research, we interviewed three teachers who used the original ReadWorks product in 2016-2017 and are using the redesigned product, post-LPS consultation, in 2017-2018. Our goal was to try to understand how some of these new features are being used and whether they are more inclusive of the variability of all learners.

The teachers we talked with work at Midwestern public elementary schools in grades K-3, with one teacher having transitioned to the role of reading specialist. A distinguishing characteristic of these teachers is that they are all enthusiastic and on the leading edge of using technology as a teaching tool. All three had extensively explored the website of their own volition and provided feedback to ReadWorks, while also telling other teachers about the available features and what they liked about them.

We interviewed the teachers twice; the interviews in September 2017 primarily explored these teachers' use of the platform in the previous school year, and the interviews in December 2017 centered on their use of the latest version of the platform in the current school year. As ReadWorks has continually added features, we focused on assessing which features the teachers had noticed and used, and also discussed features that are likely to be added in the near-term. We also asked these teachers about ReadWorks' impact on their students, specifically how the platform might have helped learners with different needs.

Audio Supports Allow All Students to Participate in Learning

Teachers reported that they value the extensive library that ReadWorks offers because of the range of articles provided and the ease in finding articles on similar topics for learners at different reading levels, allowing for personalizing the level of the article to the student while maintaining a cohesive classroom experience. One of our interviewees commented that she could find passages about the same topic of water for her readers who are below the expected reading level, at grade level, and above the expected level so that **"the passages are a little different, but they're still reading about water and then they can come back and share what they read. Everybody is reading the same topic, but they're reading it at their appropriate level."** This theme of inclusion ran throughout comments of all interviewees, showing one of the main strengths of the existing ReadWorks product.

As a result of the collaboration with LPS, ReadWorks prioritized adding audio versions of each article to further support and improve the individual reading experience. Teachers have the option of activating the audio feature

(which is either human or machine-read) when they assign a particular article to a particular student. Students then have the option of clicking to play the audio, which they can listen to while they scroll to read the text.

Teacher reactions to this feature were unanimously positive, and they often provided the audio option to all students, not just to readers who they felt needed extra supports. One teacher noted that the feature can be used with learners of varying skills, providing different benefits to each group: **"...I think for my kids that are reading below grade level, it's critical for them to hear the passage read fluently before they try to read it on their own. And then for my kids that are reading above grade level, I also think it's important for them, there might be some new words. ... I think it's beneficial to have that read aloud as well."**

The notion of audio supporting vocabulary and fluency was also brought up by the teachers, particularly in the context of English language learners. One teacher commented, "It's helpful for them to just even listen to the text and how to say words appropriately, putting articles in place. They're using their subject-verb agreement....it helps them with speaking and listening." This observation is supported by research with first graders who are learning English and benefited greatly from being able to take home books with audiotapes for extra practice (Koskinen et al., 2000).

Teachers also reported positive student reactions, including improved attitudes toward reading comprehension activities. One teacher commented, "With the new online platform, I think students who really struggle with reading don't dread it so much because they know they can have it read to them. ... A lot of the kids can comprehend what they heard; they just can't read it themselves." This change in attitude mirrors research showing that having access to audiobooks increases students' enthusiasm for reading (Whittingham et al., 2013).

Ultimately, the teachers noted how the audio supports led to greater inclusivity because all of their students could come together to discuss the content that they may have accessed in different ways. This ideal is exemplified by one teacher's story of her student who is on the Autism Spectrum: **"I do have one student who's on the spectrum...and this works really well for him because he loves being on the computer, loves listening to stories. ... He's a beginning reader, but he still gets to read about many of the same things that his classmates are reading about."**

Exploring Student Choice

At the time of our interviews, the student choice features, including text magnification, had only recently gone live on the platform, but teachers were enthusiastic about their potential reach. One teacher commented, **"I think that the student on the spectrum will benefit from the text enlargement feature. I also have a student who tends to jumble words or skip lines; I think the smaller font looks 'crowded' to him, so having a larger font that's spaced more generously could be helpful."** Thus, aligning research-based strategies with gaps in resources identified by teachers on the ground addresses needs in ways that will hopefully lead to greater adoption.

Other choice features that are planned but not yet implemented include providing a guided reading pane to assist with Attention and Inhibition and a split screen option so students can view the article and comprehension questions simultaneously, limiting the cognitive demands on their Working Memory of going back and forth between screens.

Key Takeaways

Throughout our interviews, several themes emerged that provide lessons of how greater support can be infused into existing products through the application of the research-based LPS models.

1 Technology allows for a remarkable level of individualization that promotes confidence and motivation in learners.

The new digital reading platform provided a student interface that teachers can individualize quickly and easily. In turn, the students seemed to also feel confident using the platform; they knew they would be able to do what was being asked of them with supports, if needed.

2 Designing features to the edges of learner variability actually supports all students.

It may be surprising that the teachers felt all students can benefit from audio supports, not just readers who struggle. However, the teachers were attuned to the varying needs of all of their students and welcomed the ability to easily provide optional supports. The teachers' examples also show how the use of these technological tools is in service of creating cohesion in the classroom and allowing all students to discuss together after completing an individual activity online.

3 Raising teacher awareness of additional features is critical so that the supports are actually used in the classroom.

The teachers we spoke with were self-proclaimed early adopters and explorers of the ReadWorks site, but they stressed the need for greater professional development and outreach to inform all teachers of how to best use new features to support their students. One teacher explained how she sends the teaching tips she finds to her fellow teachers who are trusting of and grateful for her recommendations.

Next Steps

This initial exploration of teachers' reactions to the results of the LPS-ReadWorks partnership suggests promising impact of the evidence-based supports which were implemented on the reading platform. The interviews indicate that students with varying abilities are able to access and use the platform in ways that meet their needs without being overwhelmed, and that teachers have found new ways to improve the classroom experience by optimizing personalization with the goal of integration.

The next steps in documenting the impact of the partnership include examining trends from over two million Pre-K to third grade students who are completing assignments using the ReadWorks platform. Determining how the new features are being used and adopted will allow planning for an experimental study of the impact of ReadWorks' design changes on student learning outcomes.

By examining measurable impacts on learners, we can observe whether LPS's theory of change has been realized.

Suggested Citation

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