METAMETRICS RESEARCH BRIEF

Learning Oasis™: Using Technology to Enhance Literacy Through Deliberate Practice

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OBJECTIVE

With new expectations that students will be college and career ready in reading and writing by high school graduation, growth in literacy skills is imperative (Dohm & Shniper, 2007; Stillwell, 2010). Emerging research from an array of fields suggests that experts are not born but rather develop expertise by engaging in deliberate practice over a long period of time (Ericsson, Charness, Feltovich, & Hoffman, 2006). Empirical results suggest that deliberate practice is required for a learner to advance from novice to expert in a domain (Glaser, 1996; Kellogg, 2006; Wagner & Stanovich, 1996). This deliberate practice must be targeted, intensive, distributed and self-directed, and provide real-time feedback using an objective developmental scale to measure progress. Providing more opportunities for deliberate literacy practice by increasing the time each student devotes to individualized, targeted reading and writing activities may overwhelm educators who teach in already-busy classrooms. Yet, with the Common Core State Standards for English Language Arts (see Figure 1) and writing, educators will have to focus more attention on growing students' literacy skills. Given this increased demand on teacher time, how can students spend the time necessary to develop as readers and writers? And what instructional strategies or technology-based solutions can educators use to guide all students onto reading growth trajectories that will result in college and career readiness?

Key Hypothesis: A technology-based solution that integrates key elements of deliberate practice can promote students' growth in reading such that they are on a growth trajectory predictive of college and career readiness.

Figure 1.
Text Complexity Grade Bands and Associated Lexile® Ranges

Text Complexity Grade Bands	Lexile Ranges Aligned to College and Career Readiness Expectations
K–1	N/A
2–3	450L–790L
4–5	770L–980L
6–8	955L–1155L
9–10	1080L–1305L
11–CCR	1215L–1355L

METHODS

Participants*:* 843 students in grades 2–12 in a diverse school district in north central Mississippi. Euro-Americans made up 56% of the students, African-Americans made up 38%, Hispanics made up 6%, and 60% of all students qualified for Free-Reduced Lunch. The students have used Learning Oasis™ for five years. They have read more than 195 million words from approximately 290,000 articles targeted to each student's reading level. Students have also taken almost 2.5 million auto-generated cloze items, have written almost 7.2 million words in 38,000 essays, and have corrected more than 180,000 errors in the paragraph edit task (Hanlon, Swartz, Stenner, Burdick, & Burdick, 2010). The specific data for writing activity usage are not included in this technical brief, but it is acknowledged that a comprehensive writing intervention has the potential to improve reading ability as well. This potential impact will be the subject of future research.

Procedure: Student growth from Learning Oasis is examined between Fall 2009 and Spring 2010. Learning Oasis is a web-based research platform that applies the principles of deliberate practice to support growth in reading and writing. It uses The Lexile® Framework for Reading to target developing readers with text in each reader's Lexile range. (Targeting each reader's ability at +/-100L helps assure a 69%–80% success rate.) Learning Oasis also incorporates a Bayesian scoring algorithm that uses current and past performance to provide the best estimate of reading ability. This approach is used to continually update the estimate of student ability after each article read. Learning Oasis contains digitized text for approximately 25,000 articles provided by EBSCO from sources like World Book and Weekly Reader. In addition, Learning Oasis also provides 1,100 articles from online English newspapers in 25 countries, 1,200 articles from the Featured Articles section of Wikipedia, and many classic texts, such as *Call of the Wild*. Students use Learning Oasis for pleasure reading or classroom assignments, and each student's reading comprehension is constantly monitored using his or her answers to auto-generated cloze items. Each student receives immediate feedback about the words chosen to complete the cloze, and the count correct is converted into a Lexile measure.

Learning Oasis also uses The Lexile Framework for Writing to monitor each student's growth in writing and convention ability through individualized writing activities.

Metrics:

- *Lexile Measure:* a measure of reader ability and text complexity based on analysis of the complete text using propriety software that evaluates its various dimensions (Stenner, Horabin, Smith, & Smith, 1988). Independent psychometric studies of the Lexile scale indicate that the Lexile measure is a valid and reliable measure of reader ability and text complexity (Mesmer, 2007; White & Clement, 2001).
- *The Lexile Framework for Reading*: scientific measurement system that matches readers with texts using a common developmental scale.
- *Cloze:* A type of reading assessment item in which the reader is asked to supply words that have been systematically deleted from a text.

ANALYSES

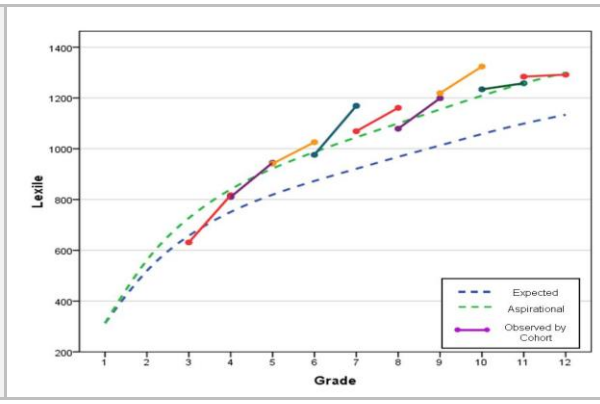
The growth in Lexile measures exhibited from Spring 2009 to Spring 2010 for students who engaged in daily deliberate practice using Learning Oasis was examined to evaluate growth in reading skill in the context of expected growth and college and career readiness. The use of Learning Oasis by grade is shown in Figure 2. Reader ability is interpreted in the context of aspirational text complexity. Students in grades 4-12 read millions of words using Learning Oasis. On average, they saw a positive difference between their observed Lexile measure and the aspirational Lexile measure predictive of college and career readiness.

Figure 2.
Learning Oasis Use and Reading Growth by Grade

Grade	4 (n=106)	5 (n=96)	6 (n=107)	7 (n=101)	8 (n=107)	9 (n=92)	10 (n=79)	11 (n=77)	12 (n=78)
Words Read	1,937,433	1,286,295	1,484,217	,300,514	1,451,626	9,897,771	3,024,775	4,607,602	6,046,607
Observed Lexile Measure (Fall, 2009)	631L	810L	941L	976L	1069L	1079L	1219L	1234L	1284L
Observed Lexile Measure (Spring, 2010)	817L	945L	1026L	1169L	1161L	1199L	1324L	1258L	1292L
Difference Observed	***186L***	***135L***	***85L***	***193L***	***92L***	***120L***	***105L***	***24L***	***8L***

In Figure 3, each line segment represents a match-sample by cohort. The first circular data point represents Spring 2009 Lexile measures, and the second circular data point represents Spring 2010 Lexile measures compiled from independent reading tests. The bottom dashed blue line represents the expected growth in reading ability given a national sample of readers. The top dashed green line represents the aspirational growth trajectory predictive of college and career readiness. The observed cohort connector represents the Spring-to-Spring growth in reading ability measured using independent reading tests for a matched sample. On average, students who used Learning Oasis experienced greater-than-expected growth in reading ability. In addition, on average, students who used Learning Oasis were on a trajectory predictive of college and career readiness in reading. For students closest to the end of high school—those in grades 10-12—all were, on average, reading above 1300L to ensure college and career readiness in reading.

Figure 3.
Growth in Reading Skill from 2009–2010 in the Context of Expected Growth and College and Career Readiness



RESULTS & DISCUSSION

Study results suggest that technology built on instructional principles that promote expertise can support college and career readiness. Students who used Learning Oasis read millions of words in articles targeted to their individual ability levels. After one year of using Learning Oasis, students at each grade level were, on average, on a reading growth trajectory predictive of college and career readiness. These results have powerful implications for educators and policymakers. For educators, a technology-based solution, like Learning Oasis, that incorporates self-directed learning would appear to promote the development of literacy skills while allowing the teacher to focus on classroom instruction. For policymakers, such a program could help elevate students to reading growth trajectories predictive of college and career readiness and help ensure that students who graduate high school do so ready to take on the challenges of the postsecondary world.

While the results point to a technology-based solution as a plausible way to promote college and career readiness in reading, they do not take into account instructional strategies employed by teachers. The data gathered from student usage of Learning Oasis do not distinctly differentiate between the influence of Learning Oasis usage and the effect that teachers and instructional strategies had on reading growth for the students in grades 4-12. Moreover, this study investigated year-over-year growth from 2009-2010. Many students actually have been using Learning Oasis since 2006, which could obscure the real value of this personalized learning platform since longitudinal growth rates are not independent. These are areas that could inform future research questions and studies.

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