

REL Appalachia Summary of Verified Research Findings

June 2020

Question:

What online learning resources to support students have evidence of effectiveness?

Response:

Thank you for your request to our REL Reference Desk regarding evidence-based information about online learning resources that are available to support students. To answer this question, the REL Appalachia research team identified programs that rigorous evaluation shows have the potential to improve outcomes for participating students. The search was limited to information returned from the search features on the [What Works Clearinghouse](#) and [Evidence for ESSA](#) websites and in accordance with the online learning search parameters described at the end of this memo. Evaluations reviewed by the WWC met group design standards with or without reservations, and evaluations from the Evidence for ESSA site met a Strong ESSA Evidence rating.¹

Our search yielded eight reading or math programs with strong ESSA evidence or positive effects as rated by What Works Clearinghouse:

- Achieve3000®
- Headsprout® Early Reading
- Intelligent Tutoring for the Structure Strategy (ITSS)
- Reading Plus
- ASSISTments
- DreamBox Learning
- Odyssey® Math
- An Online Algebra 1 program

We also identified a What Works Clearinghouse practice guide related to the use of technology in postsecondary education that may be of interest.² The tables below summarize each program by subject and the evidence identified from the What Works Clearinghouse and Evidence for ESSA sites.

¹ See Exhibit 3 for more information about Evidence for ESSA and WWC methods to determine evaluation rigor.

² The references presented here are not necessarily comprehensive, and other relevant references and resources may exist. Interventions and references appear in alphabetical order, not necessarily in order of relevance.

Exhibit 1. Evidence-based literacy programs

<i>Program name and Synchronous/asynchronous learning experience</i>	<i>Description</i>	<i>Grade-levels offered</i>	<i>Grade-levels studied³</i>	<i>Evidence rating</i>	<i>Outcomes improved</i>	<i>Evidence source</i>
Achieve3000[®] – Secondary 	A supplemental online literacy program that provides nonfiction reading content and focuses on building phonemic awareness, phonics, fluency, reading comprehension, vocabulary, and writing skills. Designed to help students advance their nonfiction reading skills by providing differentiated online instruction.	2–12	6, 9	Strong Evidence ⁴	Literacy Achievement	Center for Research and Reform in Education at Johns Hopkins University. (n.d.). Achieve3000[®] – Secondary. Evidence for ESSA.
Headsprout[®] Early Reading 	An Internet-based supplemental early literacy curriculum consisting of eighty 20-minute animated episodes, the first 40 of which are appropriate for prekindergarten age students that are designed to teach phonemic awareness, phonics, fluency, vocabulary, and comprehension. Adapts to a child’s responses, providing additional instruction and review if a child does not choose the correct answer.	K–2	Pre-K	Potentially Positive Effects	Oral Language Print Knowledge	U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, What Works Clearinghouse. (2009, October).

³ Rigorous evidence is not available for all grade levels offered. Evidence Rating and Outcomes Improved are based on the grade levels studied.

⁴ WWC reports Achieve3000[®] has potentially positive effects for grades 2–8 on comprehension and literacy achievement.

<i>Program name and Synchronous/asynchronous learning experience</i>	<i>Description</i>	<i>Grade-levels offered</i>	<i>Grade-levels studied³</i>	<i>Evidence rating</i>	<i>Outcomes improved</i>	<i>Evidence source</i>
Intelligent Tutoring for the Structure Strategy (ITSS)–Elementary 	<p>A web-based approach in which students are taught to read nonfiction texts by seeking signals within texts to guide their comprehension. Students work with software in which animated “tutors” model and guide the learner, using graphic organizers, highlighted text and other devices. Students practice, take regular assessments, and receive feedback, proceeding at their own pace through the material.</p>	K–8	4–5	Strong Evidence	Reading Comprehension	Center for Research and Reform in Education at Johns Hopkins University. (n.d.). Intelligent Tutoring for the Structure Strategy (ITSS)–Elementary. Evidence for ESSA.
Reading Plus 	<p>A web-based literacy program that includes a valid and reliable assessment and is designed to strengthen reading comprehension, vocabulary, efficiency, and motivation. The program combines personalized practice and adaptive instruction and offers students choice and control over their program experience.</p>	3–12+	4–5	Strong Evidence	Reading Achievement	Center for Research and Reform in Education at Johns Hopkins University. (n.d.). Reading Plus. Evidence for ESSA.
 Asynchronous  Synchronous  Asynchronous and synchronous components						

Exhibit 2. Evidence-based mathematics programs

<i>Program name and Synchronous/asynchronous learning experience</i>	<i>Description</i>	<i>Grade-levels offered</i>	<i>Grade-levels studied⁵</i>	<i>Evidence rating</i>	<i>Outcomes improved</i>	<i>Evidence source</i>
<p><u>ASSISTments</u></p> 	<p>An online homework tool coupled with teacher training, providing students with math assistance and teachers with assessments of student progress. Two types of ASSISTment content—the first is linked to existing textbook homework problems and provides teachers the flexibility to assign suitable problem sets and the second is intended for mastery-oriented skill practice.</p>	2–12	Grade 7	Strong Evidence	General Mathematics Achievement	<p><u>Center for Research and Reform in Education at Johns Hopkins University. (n.d.). ASSISTments. Evidence for ESSA.</u></p>
<p><u>DreamBox Learning</u></p> 	<p>A supplemental online mathematics program that provides adaptive instruction for students in grades K–5 and focuses on number and operations, place value, and number sense. Aims to individualize instruction for each student and is based on the National Council of Teachers of Mathematics (NCTM) standards.</p>	K–5	K–1	Potentially Positive Effects	General Mathematics Achievement	<p><u>U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, What Works Clearinghouse. (2013, December).</u></p>

⁵ Rigorous evidence is not available for all grade levels offered. Evidence Rating and Outcomes Improved are based on the grade levels studied.

<i>Program name and Synchronous/asynchronous learning experience</i>	<i>Description</i>	<i>Grade-levels offered</i>	<i>Grade-levels studied⁵</i>	<i>Evidence rating</i>	<i>Outcomes improved</i>	<i>Evidence source</i>
 Odyssey [®] Math ⁶	A web-based program developed by Compass Learning [®] for mathematics instruction. Includes a mathematics curriculum and formative assessments designed to support differentiated and data-driven instruction.	K–8	4–8	Potentially Positive Effects	General Mathematics Achievement	U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, What Works Clearinghouse. (2017, January).
 Online Algebra 1 Program	The study used an existing Algebra I online course developed by Class.com. The program includes three instructional components: Online course software, trained online teachers provided by Class.com, and onsite proctors provided by the school.	Grade 8	Grade 8	Strong Evidence	General Mathematics Achievement	U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, What Works Clearinghouse. (2012, March).
 Asynchronous  Synchronous  Asynchronous and synchronous components						

⁶ The REL AP team did not identify a web page for Odyssey[®] Math to link in this report.

Exhibit 3. Criteria used to determine the rating of effectiveness for an intervention

<i>Evidence Rating</i>	<i>Description</i>
ESSA⁷	
Demonstrates a rationale	Well-specified logic model or theory of action. Includes ongoing efforts to collect evidence.
Promising evidence	At least one well-designed and implemented correlational study demonstrating a statistically significant effect on relevant outcomes, which includes controls for statistical bias.
Moderate evidence	At least one well-designed and implemented quasi-experimental study demonstrating a statistically significant effect on relevant outcomes.
Strong evidence	At least one well-designed and implemented experimental study demonstrating a statistically significant effect on relevant outcomes.
WWC⁸	
Positive effects	At least two studies are rated Meets WWC Standards Without Reservations or Meets WWC Standards With Reservations AND the mean effect from a fixed-effects meta-analysis of these studies is statistically significant and positive AND more than 50.0 percent of the fixed-effects meta-analytic weight comes from studies that are rated Meets WWC Standards Without Reservations.
Potentially positive effects	At least two studies are rated Meets WWC Standards Without Reservations or Meet WWC Standards With Reservations AND the mean effect from a fixed-effects meta-analysis of these studies is statistically significant and positive AND 50.0 percent or less of the fixed-effects meta-analytic weight comes from studies that are rated Meets WWC Standards Without Reservations; OR one study is rated Meets WWC Standards Without Reservations or Meets WWC Standards With Reservations AND the study has a statistically significant and positive effect.
Uncertain effects	At least two studies are rated Meets WWC Standards Without Reservations or Meets WWC Standards With Reservations AND the mean effect from a fixed-effects meta-analysis of these studies is not statistically significant; OR one study is rated Meets WWC Standards Without Reservations or Meets WWC Standards With Reservations AND the study does not have a statistically significant effect.
Potentially negative effects	At least two studies are rated Meets WWC Standards Without Reservations or Meets WWC Standards With Reservations; AND the mean effect from a fixed-effects meta-analysis of these studies is statistically significant and negative AND 50.0 percent or less of the fixed-effects meta-analytic weight comes from studies that are rated Meet WWC Standards Without Reservations; OR one study is rated Meets WWC Standards Without Reservations or Meets WWC Standards With Reservations AND the study has a statistically significant and negative effect.
Negative effects	At least two studies are rated Meet WWC Standards Without Reservations or Meet WWC Standards With Reservations AND the mean effect from a fixed-effects meta-analysis of these studies is statistically significant and negative AND more than 50.0 percent of the fixed-effects meta-analytic weight comes from studies that are rated Meets WWC Standards Without Reservations.

⁷ For more information, visit: <https://www2.ed.gov/policy/elsec/leg/essa/guidanceusesinvestment.pdf>

⁸ For more information, visit: <https://ies.ed.gov/ncee/wwc/Docs/referenceresources/WWC-Procedures-Handbook-v4-1-508.pdf>

Additional references

Dabbagh, N., Bass, R., Bishop, M., Costelloe, S., Cummings, K., Freeman, B., Frye, M., Picciano, A. G., Porowski, A., Sparrow, J., & Wilson, S. J. (2019). *Using technology to support postsecondary student learning: A practice guide for college and university administrators, advisors, and faculty*. Washington, DC: Institute of Education Sciences, What Works Clearinghouse. Retrieved from <https://ies.ed.gov/ncee/wwc/PracticeGuide/25>

Databases and methods

We searched the What Works Clearinghouse (WWC), an IES-sponsored resource that reviews existing research on education programs, products, practices, and policies to provide educators with information to make evidence-based decisions. We searched for WWC intervention reports specific to online programs and reviewed individual studies pertaining to online learning that had been rated ESSA Tier 1 or Tier 2. The search also included a review of IES practice guides.

We also searched the Evidence for ESSA website, a resource provided by the Center for Research and Reform in Education at Johns Hopkins University School of Education, in collaboration with a distinguished Technical Working Group and a Stakeholder Advisory Group. We reviewed online programs in the Reading and Math topic areas that had Strong or Moderate evidence levels. REL AP staff included in this memo available information about online programs that could be implemented in a completely virtual setting.

Resources included in this document were last accessed on June 5, 2020. URLs, descriptions, and content included here were current at that time.

This memorandum is one in a series of quick-turnaround responses to specific questions posed by education stakeholders in the Appalachia region (Kentucky, Tennessee, Virginia, and West Virginia), which is served by the Regional Educational Laboratory Appalachia (REL AP) at SRI International. This response was developed by REL AP under Contract ED-IES-17-C-0004 from the U.S. Department of Education, Institute of Education Sciences, administered by SRI International. The content does not necessarily reflect the views or policies of IES or the U.S. Department of Education, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. government.