

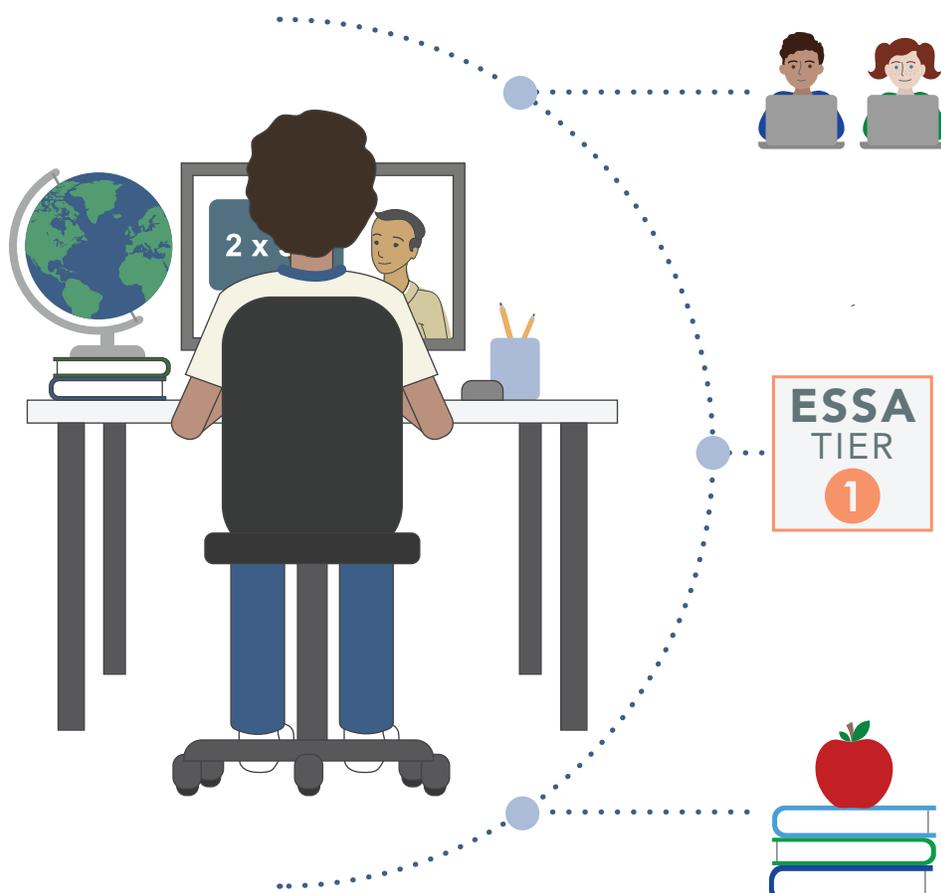
Highlights of the Distance Learning Rapid Evidence Review

The COVID-19 pandemic resulted in educators and school administrators needing to understand the variety of available distance learning models and programs. To address this need, the What Works Clearinghouse (WWC) conducted a rapid evidence review¹ to report on what works in distance learning.

The WWC reviewed **36** studies that ranged from kindergarten to postsecondary, and **15** of the studies reviewed met WWC Group Design Standards.

What were the findings?

The review process revealed several **significant evidence gaps in this area of research and continued research using rigorous, randomized designs** should be a priority.



Majority of studies were on K-8 distance programs

11 of the studies that met WWC standards were on K-8 programs, **3** studies were on postsecondary programs, and **1** study was on a high school program.

Some of the studies reviewed met the Every Student Succeeds Act (ESSA) Tier 1 requirements

3 distance learning programs had studies that met ESSA Tier 1 Requirements.

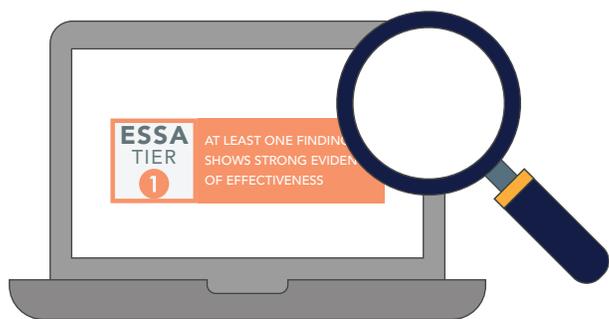
Improvements found in mathematics and English language arts

2 distance learning programs that had studies meeting ESSA Tier 1 requirements demonstrated positive effects in general mathematics achievement, and **1** demonstrated positive effects in reading comprehension.

¹Sahni, S.D., Polanin, J.R., Zhang, Q., Michaelson, L.E., Caverly, S., Polese, M.L., & Yang, J. (2021a). *A What Works Clearinghouse rapid evidence review of distance learning programs* (WWC 2021-005REV). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, What Works Clearinghouse. Retrieved from <https://ies.ed.gov/ncee/wwc/DistanceLearningStudy>.

What does an ESSA Tier 1 Rating mean?

The programs described below had at least one study that



- was a well-designed, well-implemented, experimental design that received the WWC’s highest study rating, Meets WWC Group Design Standards Without Reservations;²
- was conducted in multiple education sites and with a large sample of 350 or more students; and
- demonstrated a statistically significant and positive effect of the intervention on at least one relevant outcome.

Which three programs had studies that met ESSA Tier 1?

ESSA TIER 1 Online Algebra I

Program Description		Program Features			
<p>The Online Algebra I curriculum used electronic textbooks with interactive features such as computerized direct instruction and practice problem sets with automated feedback. Students received a variety of multimedia materials, used a discussion board, and communicated with teachers using a messaging feature. Online teachers graded homework, monitored student understanding, promoted student engagement, conducted online discussions, and monitored student performance. Students used the software in schools where an on-site proctor supported students. Implementation data showed that online teachers spent less time working directly with students and that on-site proctors spent more time communicating with students about mathematics than planned.</p>		<p>Program Type</p> <p>Full Curriculum</p>	<p>Delivery Method</p> <p>Fully Online</p>		
		<p>Teacher-Student Interaction</p> <p>Teacher-Led Asynchronous</p>	<p>Cost</p> <p>Some Cost</p>		
<p>Content Coverage: Broad Participant Grade Level: 8th grade</p>		<p>Gamification: No Adaptive: No</p>	<p>Duration: Students used the curriculum for one full academic year.</p>		
<p>Findings This study meets <i>WWC Group Design Standards Without Reservations</i> and has at least one statistically significant finding.</p>					
Outcome measure	Comparison	Sample	Significant?	Improvement Index	
Advanced Coursetaking	Online Algebra I vs. business as usual	440 students	Yes		
General Mathematics Achievement	Online Algebra I vs. business as usual	440 students	Yes		
Citation					
<p>Heppen, J. B., Walters, K., Clements, M., Faria, A. M., Tobey, C., Sorensen, N., & Culp, K. (2011). <i>Access to algebra 1: The effects of online mathematics for grade 8 students</i> [NCEE 2012-402]. Washington, DC: National Center for Education Evaluation and Regional Assistance. https://eric.ed.gov/?id=ED527394</p>					

²All studies included in this evidence scan were reviewed previously by the WWC under the WWC Group Design Standards, Version 2.1. or higher.

For more information on distance learning, visit <https://ies.ed.gov/ncee/wwc/DistanceLearningStudy>



Program Description	Program Features	
<p>Intelligent Tutoring for the Structure Strategy (ITSS) is a supplemental, online program for students in grades K-8 to develop literacy skills and understand factual texts used in everyday settings. Students learn how to use text structure, key words, and logical structure to better understand and recall information. In particular, ITSS highlights five main text structures that (a) make comparisons; (b) present problems and solutions; (c) link causes and effects; (d) present sequences; and (e) describe things, people, creatures, places, and events.</p> <p>The WWC intervention report on ITSS can be retrieved from https://ies.ed.gov/ncee/wwc/InterventionReport/703.</p> <p>The WWC reviews on ITSS can be retrieved from https://ies.ed.gov/ncee/wwc/Study/77453, https://ies.ed.gov/ncee/wwc/Study/86126, https://ies.ed.gov/ncee/wwc/study/86233, and https://ies.ed.gov/ncee/wwc/study/89695.</p>	<p>Program Type</p>  <p>Supplemental</p>	<p>Delivery Method</p>  <p>Fully Online</p>
	<p>Teacher-Student Interaction</p>  <p>Automated/Not Teacher-Directed</p>	<p>Cost</p>  <p>Some Cost</p>

Content Coverage: Narrow
Participant Grade Level: 4th, 5th and 7th grades

Gamification: No
Adaptive: Yes

Duration: Students use the program throughout the academic year, for 30-45 minutes per session, one to three times a week.

Findings | The following studies [Meet WWC Standards Without Reservations](#) and have at least one statistically significant positive finding.

Outcome measure	Comparison	Sample	Significant?	Improvement Index
Comprehension	ITSS vs. business as usual	4,196 students	Yes	

Citations

Wijekumar, K. K., Meyer, B. J. F., & Lei, P. (2012). Large-scale randomized controlled trial with 4th graders using intelligent tutoring of the structure strategy to improve nonfiction reading comprehension. *Educational Technology Research and Development*, 60(6), 987-1013. <https://eric.ed.gov/?id=EJ986753>

Wijekumar, K., Meyer, B. J., Lei, P. W., Lin, Y. C., Johnson, L. A., Spielvogel, J. A., Shurmatz, K.M., Ray, M., Cook, M. (2014). Multisite randomized controlled trial examining intelligent tutoring of structure strategy for fifth-grade readers. *Journal of Research on Educational Effectiveness*, 7(4), 331-357. <https://eric.ed.gov/?id=EJ1041354>

Additional Citations | The following studies Meet WWC Group Design Standards With Reservations or did not have at least one statistically significant positive finding.

Meyer, B. J., Wijekumar, K., Middlemiss, W., Higley, K., Lei, P. W., Meier, C., & Spielvogel, J. (2010). Web-based tutoring of the structure strategy with or without elaborated feedback or choice for fifth- and seventh-grade readers. *Reading Research Quarterly*, 45(1), 62-92. <https://eric.ed.gov/?id=EJ871741>

Meyer, B. J. F., Wijekumar, K. K., & Lin, Y. (2011). Individualizing a web-based structure strategy intervention for fifth graders' comprehension of nonfiction. *Journal of Educational Psychology*, 103(1), 140-168. <https://eric.ed.gov/?id=EJ914858>

Wijekumar, K., Meyer, B. J. F., & Lei, P. (2017). Web-based text structure strategy instruction improves seventh graders' content area reading comprehension. *Journal of Educational Psychology*, 109(6), 741-760. <https://eric.ed.gov/?id=EJ1149967>



To learn more about the WWC,
visit our website
whatworks.ed.gov

Program Description	Program Features	
ASSISTments is a web-based platform for mathematics homework and related teacher training. The web platform is used by students to complete their mathematics homework and provides them with immediate feedback while they solve assigned problem sets. The platform provides teachers with reports on student performance and commonly missed questions. For this study, the ASSISTments software was loaded with all homework problems from all textbooks in use among intervention schools, as well as mathematics extension activities called “skill builders” covering more than 300 topics appropriate for grade 7.	Program Type  Supplemental	Delivery Method  Hybrid
	Teacher-Student Interaction  Teacher-Led Synchronous	Cost  Free

Content Coverage: Broad
Participant Grade Level: 7th grade

Gamification: No
Adaptive: Yes

Duration: Schools implemented ASSISTments for two academic years. Student cohorts used the program for one academic year each.

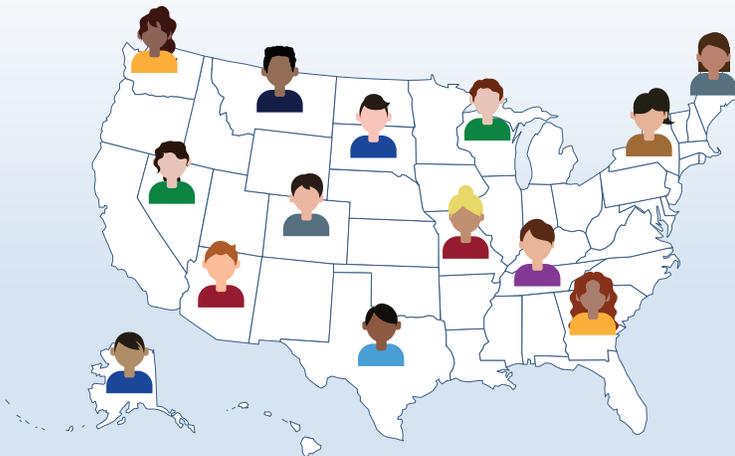
Findings | This study meets [WWC Group Design Standards Without Reservations](#) and has at least one statistically significant finding.

Outcome measure	Comparison	Sample	Significant?	Improvement Index
General Mathematics Achievement	ASSISTments vs. business as usual	2,728 students	Yes	

Citation

Roschelle, J., Feng, M., Murphy, R. F., & Mason, C. A. (2016). Online mathematics homework increases student achievement. *AERA Open*, 2(4), 1-12. <https://eric.ed.gov/?id=ED575159>

Limitations



Impact of COVID-19: Education stakeholders, in addition to parents, guardians, teachers, or students, participated in these programs and evaluations before the COVID-19 pandemic. The results of the program evaluations may not fully translate to the circumstances of the current situation.

Exclusion Criteria: Necessary exclusion criteria for this review required studies to be peer-reviewed, randomized control trials (RCTs) that reported statistically significant positive results and were in the ERIC database. This excluded RCTs without positive results, as well as rigorous quasi-experimental designs.