

# RESEARCH REVIEW: Impacts and Implementation of Blended Learning

## What is BLENDED LEARNING?

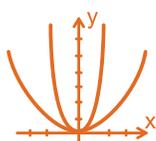
**Blended learning** is a personalized learning approach that combines online and face-to-face instruction to differentiate the content, pace, and difficulty of instruction for each student.



### IMPACT: Does blended learning improve student learning?

Existing evidence indicates that **some blended learning interventions improve outcomes**, but the existence of a **positive effect varies** for different interventions and domains of achievement.

A **Regional Educational Laboratory (REL) Central review<sup>1</sup>** of blended learning identified 3 interventions for which the **What Works Clearinghouse (WWC)** recently prepared **Intervention Reports<sup>2</sup>** to summarize findings from studies meeting its evidence standards:



**Cognitive Tutor<sup>®</sup> Algebra I:** The WWC review found **mixed effects** on algebra achievement<sup>3</sup> and **no discernible effects** on general mathematics achievement for secondary students.

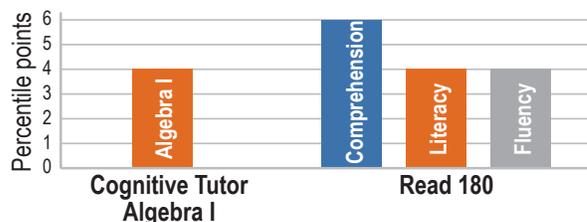
**Cognitive Tutor<sup>®</sup> Geometry:** The WWC review found **potentially negative effects** on geometry for secondary students.



**Read 180<sup>®</sup>:** The WWC review found **positive effects** on comprehension and general literacy achievement, **potentially positive effects** on reading fluency, and **no discernible effects** on alphabets for adolescent readers.

The **What Works Clearinghouse** reviews the existing research on different programs, products, practices, and policies in education. Its goal is to provide educators with the information they need to make evidence-based decisions. It focuses on the results from high-quality research to answer the question "What works in education?"

### Average improvement index for two blended learning interventions with positive effects



\*Note: The WWC found no discernible effects of Cognitive Tutor<sup>®</sup> Algebra I on general mathematics achievement, no discernible effects of Read 180<sup>®</sup> on alphabets, and a potentially negative effect of 8 percentile points of Cognitive Tutor<sup>®</sup> Geometry on geometry scores.

The **improvement index** is the expected change in percentile rank for an average student in the comparison group if the student had received the intervention.

REL Central **identified 5 other reading interventions** with studies that the review determined would **meet WWC evidence standards<sup>4</sup>**.

**1 study of LeapTrack** and **1 study of Time to Know** found statistically significant, positive effects on reading achievement.<sup>5</sup>

**2 studies of PLATO<sup>®</sup> Focus, Destination Reading<sup>®</sup>, and Waterford Early Reading** found no statistically significant effects on reading achievement.

## IMPLEMENTATION: What practices are schools using to personalize learning?

Research has yet to definitively **identify the strategies for implementing blended learning** that increase the likelihood of positive effects on students.



A study of schools that received grants to personalize classroom instruction and use technology found greater implementation of 4 strategies relative to a comparison group (Pane, et al 2017).

### Personalized learning strategies



Develop **learner profiles** to record each student's strengths, needs, motivations, progress, and goals.

Chart **personal learning paths** through content that hold students to high expectations.

Promote **competency-based progression** where students advance when they meet continuously assessed goals.

Create **flexible learning environments** where schools adapt how they use resources to support personalized learning.

### How practices in grant-receiving schools differed from those in comparison schools



**Greater use of student data by teachers** to personalize instruction and by students to track their learning progress.

**Additional time dedicated to one-on-one support** of student learning, and less time to large-group instruction.

**Increased focus on letting students work at different paces and on different content**, requiring that they practice material until they demonstrate competency, and requiring that they get through certain material even if working at their own pace.

**Greater use** of open spaces, comfortable furniture, co-teaching, flexible scheduling, frequent adjustments to student groups based on data, and technology-based instructional materials.

**Challenges to anticipate when implementing personalized learning** include (Pane, et al 2017):



- ▶ **Lack of integration between digital curriculum programs and other systems** such as learning management systems in which teachers record grades
- ▶ **Tension between the need to address standards and personalizing instruction** through competency-based progression and student choice
- ▶ **Limited time** to develop personalized lessons

<sup>1</sup> Brodersen & Melluzzo (2017).

<sup>2</sup> WWC Intervention Reports on Cognitive Tutor® and Read 180® (What Works Clearinghouse 2016a, 2016b).

<sup>3</sup> The WWC evidence rating is mixed in this case because the number of studies with indeterminate effects (3) exceeded the number of studies with statistically significant or substantively important positive effects (2). No studies showed statistically significant or substantively important negative effects.

<sup>4</sup> Brodersen & Melluzzo (2017) determined that the evidence for the Time to Know intervention would meet WWC evidence standards with reservations. They determined that the evidence for the other 4 interventions would meet WWC evidence standards without reservations.

<sup>5</sup> Improvement index results have not been calculated for these interventions.

Brodersen, R.M., and D. Melluzzo. "Summary of Research on Online and Blended Learning Programs that Offer Differentiated Learning Options." REL 2017-228. Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Central, 2017. Available at <http://ies.ed.gov/ncee/edlabs>.

Pane, J.F., E.D. Steiner, M.D. Baird, L.S. Hamilton, and J.D. Pane. "Informing Progress: Insights on Personalized Learning Implementation and Effects." Santa Monica, CA: RAND Corporation, 2017. Available at [https://www.rand.org/pubs/research\\_reports/RR2042.html](https://www.rand.org/pubs/research_reports/RR2042.html).

What Works Clearinghouse. "Secondary Mathematics Intervention Report: Cognitive Tutor®." Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, What Works Clearinghouse, 2016a. Available at <http://whatworks.ed.gov>.

What Works Clearinghouse. "Adolescent Literacy Intervention Report: Read 180®." Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, What Works Clearinghouse, 2016b. Available at <http://whatworks.ed.gov>.