

Social Programs That Work Review

Evidence Summary for ASSISTments – An Online Study Tool For Seventh Grade Math

HIGHLIGHTS:

- **PROGRAM:** ASSISTments is a low-cost, online study tool that assists seventh grade students with math homework and produces real-time reports on student performance (e.g., concepts they are struggling with) that teachers can then use to tailor next-day lesson plans. ASSISTments is a “universal” program – i.e., delivered to all students, not just those who are struggling and/or low income.
- **EVALUATION METHODS:** ASSISTments has been evaluated in two large, well-conducted randomized controlled trials (RCTs) – one in Maine with a sample of 46 public schools containing 3,050 seventh graders, the other in North Carolina with a sample of 63 public schools containing 9,073 seventh graders.
- **KEY FINDINGS:** Both studies found sizable effects on math achievement on established, standardized tests. The effect size in the Maine study, measured at the end of seventh grade, represented about a 60% improvement over the annual gain in math otherwise expected of seventh graders. The North Carolina study was unable to measure impacts at the end of seventh grade (due to the COVID-19 pandemic), but found a sustained impact at the end of 8th grade – one year after program completion. The effect size represented about a 31% improvement over the annual gain in math otherwise expected of eighth graders.

[Disclosure: Arnold Ventures helped fund study 2, described below.]

I. Evidence rating: TOP TIER

The standard for Top Tier is:

Programs shown in well-conducted RCTs, carried out in typical community settings, to produce sizable, sustained effects on important outcomes. Top Tier evidence includes a requirement for replication – i.e., the demonstration of such effects in two or more RCTs conducted in different implementation sites, or, alternatively, in one large multi-site RCT. Such evidence provides confidence that the program would produce important effects if implemented faithfully in settings and populations similar to those in the original studies.

II. Description of the Program:

ASSISTments is an online study tool that assists seventh grade students with math homework and produces real-time reports for teachers on student performance. As students work through homework problems and enter their answers into ASSISTments, the system provides immediate feedback on the correctness of answers and offers additional assistance in the form of hints or scaffolds. ASSISTments provides teachers with real-time, easily accessible reports that summarize student work for a particular assignment, which teachers can use to target their homework review in class and tailor instruction to their students' needs. ASSISTments is a "universal" program – i.e., delivered to all students, not just those who are struggling and/or low income. The program's cost is less than \$100 per student.

The ASSISTments program website is [linked here](#).

III. Evidence of Effectiveness:

This summary of the evidence is based on a systematic search of the literature to identify all well-conducted RCTs of ASSISTments. Our search identified two such studies, summarized as follows.

STUDY 1 (Maine)

Study Design:

The study team randomly assigned 46 public schools in Maine to a treatment group that implemented ASSISTments in all seventh grade math classrooms in the 2013-14 and 2014-15 school years, versus a control group that did not. The student sample comprised all 3,050 sixth grade students in the study schools in the preceding school years (i.e., 2012-13 and 2013-14), who then received ASSISTments when they advanced to seventh grade. The student sample was 93% White, and 39% were economically disadvantaged. The study's primary outcome was student achievement as measured by the TerraNova Common Core assessment mathematics test – a well-established standardized test – at the end of the program year.

Key Findings:

At the end of seventh grade (i.e., the program year), the study found a sizable, statistically significant impact on student math achievement on the TerraNova. The impact (0.18 standard deviations, $p < 0.01$) represents about a 60% improvement over the annual gain in math otherwise expected for seventh graders.¹ The study also examined whether the program's impact for lower-performing students (those with baseline math scores below the median) differed from its impact for higher-performing students. It found a larger impact (0.29 standard deviations) for the lower-performing students, and the difference in impacts between the lower- and higher-performing students was statistically significant.

¹ The average annual gain in math achievement for U.S. seventh grade students on six nationally normed tests is 0.30 standard deviations (see Bloom, Hill, Black, and Lipsey, 2007). ASSISTments' impact of 0.18 represents a 60% improvement over this annual gain.

Discussion of Study Quality:

Based on careful review, we believe this was a well-conducted RCT. For example, the treatment and control groups were highly similar in their pre-program characteristics. The study had low school-level sample attrition (6.5% of schools were lost to follow-up) and student-level sample attrition (10.1% of students were lost to follow-up), and attrition rates were similar for the treatment versus control group. These rates constitute low sample attrition under the What Works Clearinghouse’s “cautious” standard ([WWC Procedures and Standards Handbook](#), Version 5.0, 2022). The study appropriately estimated ASSISTments’ effects for all members of the treatment group, regardless of whether or how long they received program services (i.e., used an intent-to-treat analysis). The study’s analyses appropriately accounted for the fact that schools, rather than individual students, were randomly assigned.

STUDY 2 (North Carolina)

Study Design:

The study team randomly assigned 63 public schools in North Carolina to a treatment group that implemented ASSISTments in seventh grade math classrooms versus a control group that did not. The student sample comprised all 9,073 seventh graders in these schools in the 2019-2020 school year whose sixth grade (baseline) test scores were available to the study team. Sample members were 17% Black, 19% Hispanic, and 56% White, and 53% were economically disadvantaged. The study’s [pre-registered](#) primary outcome was math achievement on the North Carolina state test (EOG-MA08) at the end of eighth grade – one year after program completion.²

Key Findings:

At the end of eighth grade (one year post-program), the study found a sizable, statistically significant impact on student math achievement on the state test. The impact (0.10 standard deviations, $p=0.01$) represents about a 31% improvement over the annual gain in math otherwise expected for eighth graders.³ The presence of this impact one year after program completion is evidence of a sustained learning gain. The study also examined, as a primary research question, whether the program’s impact for lower-performing students (those with baseline math scores below the median) differed from its impact for higher-performing students. It found suggestive evidence (near statistically significant, $p<0.10$) of a larger impact for higher-performing students.

² The researchers originally intended to measure the program’s impact on student math achievement at both the end of seventh and eighth grade, but the state achievement test was canceled during the spring of seventh grade (spring 2020) due to the COVID-19 pandemic.

³ The average annual gain in math achievement for U.S. eighth grade students on six nationally normed tests is 0.32 standard deviations (see [Bloom, Hill, Black, and Lipsey, 2007](#)). ASSISTments’ impact of 0.10 represents a 31% improvement over this annual gain. One caveat regarding this comparison is that while the North Carolina state test used to estimate ASSISTments’ impact was similar to the six tests in Bloom 2007 in measuring broadband math achievement (versus just a specific topic such as fractions), it was – unlike the six tests – not nationally normed. For that reason, the comparison of ASSISTments’ impact against the Bloom 2007 benchmark is best viewed as illustrative rather than exact.

Discussion of Study Quality:

Based on careful review, we believe this was a well-conducted RCT. For example, the treatment and control groups were highly similar in their pre-program characteristics. No schools dropped out of the study sample. The student-level attrition rate for the primary outcome (state test scores at the end of eighth grade) was 34% and virtually identical for the treatment versus control group, thus constituting low attrition under the What Works Clearinghouse’s “cautious” standard ([WWC Procedures and Standards Handbook](#), Version 5.0, 2022). The study appropriately estimated ASSISTments’ effects for all members of the treatment group, regardless of whether or how long they received program services (i.e., used an intent-to-treat analysis). The study’s analyses appropriately accounted for the fact that schools, rather than individual students, were randomly assigned. The study appropriately [pre-registered](#) its primary outcome and analyses, and closely adhered to the pre-registered analysis plan in estimating program effects.

IV. References:

Study 1:

Murphy, R., Roschelle, J., Feng, M., & Mason, C. A. (2020) “Investigating Efficacy, Moderators and Mediators for an Online Mathematics Homework Intervention.” *Journal of Research on Educational Effectiveness*, 13(2), pp. 235-270.

Roschelle, J., Feng, M., Murphy, R. F., & Mason, C. A. (2016). “Online Mathematics Homework Increases Student Achievement.” *AERA Open*, 2(4), pp. 1-12.

Study 2:

Feng, M., Huang, C-W., & Collins, K. (2024). *Supporting middle school math learning with a technology-based intervention: Impact, moderators and usage*. WestEd. San Francisco, CA ([link](#)).

Feng, M., Weiser, G., & Collins, K. (2024). *Cost and cost effectiveness of ASSISTments online math support: Analysis from a randomized controlled study in middle school*. WestEd. San Francisco, CA ([link](#)).