

EFFICACY

Amplify CKLA AZ grade 5 efficacy research report

Amplify.

Table of contents

Executive summary 3

About Amplify CKLA 4

Method 5

Results 8

Discussion 11

References.....12

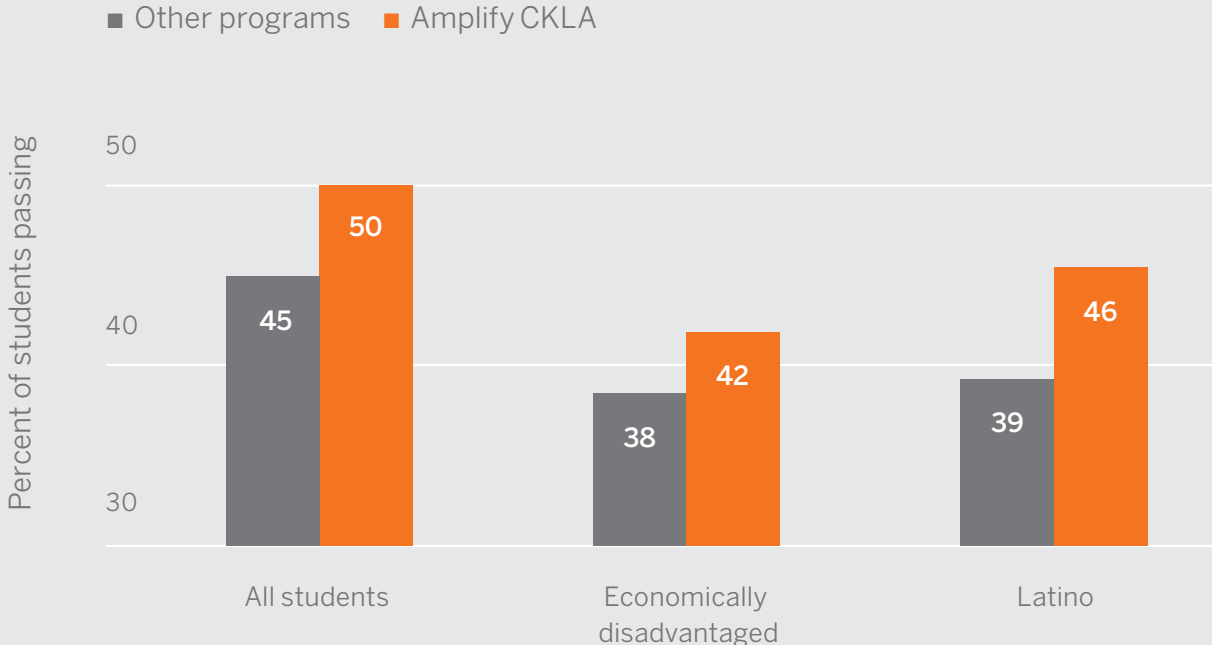
Appendix A.....13

Executive summary

This paper describes a study of ELA outcomes for schools using Amplify Core Knowledge Language Arts (CKLA) 2nd Edition, based on analysis of Arizona Merit (AzMERIT) outcomes in ELA for students in grades 5. The study was designed as a test of Amplify CKLA's theory of action: All students can succeed in ELA if they are all introduced to the necessary background knowledge and explicit foundational skills required to succeed in reading. First, baseline outcomes for Amplify CKLA students and students using other programs were compared. Then, a multiple regression analysis was conducted to investigate the relationship between a school's use of Amplify CKLA and ELA performance, while controlling for selection bias using previous scores and school-level demographic variables.

The study compared results for three student populations: (1) all students; (2) economically disadvantaged students; and (3) Latino students. The study found that use of Amplify CKLA was a positive predictor of improved outcomes on the AzMERIT state test. Specifically, Amplify CKLA was found to be a significant positive predictor in AzMERIT Grade 5 outcomes for the group of all students, a significant positive predictor in AzMERIT Grade 5 outcomes for Latino students, and a positive predictor in AzMERIT Grade 5 outcomes for economically disadvantaged students.

Outcomes for Amplify CKLA vs. other programs



About Amplify CKLA

Amplify CKLA is a core instructional ELA program for students in grades PreK–5, designed with equity in mind. The program aims to solve the problem of students from economically disadvantaged backgrounds or from disadvantaged minority groups not having as much access as more advantaged students to the knowledge base necessary for reading comprehension.

Amplify CKLA's theory of action posits that only when all students are provided with broad background knowledge, vocabulary, and foundational skills can we achieve equity in reading outcomes. The program starts by exposing all children to a wide range of background knowledge in science, literature, world and American history, and the arts, beginning with the Knowledge Strand in grades K–2 and continuing this exposure in grades 3–5.

In alignment with this scope and sequence, Amplify CKLA includes rigorous lessons with multiple components designed to build a base of background knowledge and strong foundational reading skills, including Read Alouds; close reading; Comprehension Questions; vocabulary; explicit and systemic phonics instruction; grammar; writing; morphology; spelling; whole-group, small-group, and partner reading; and both unit and daily formative assessments.

Present study

This study, conducted in the spring of 2019, compares scores from first-year users of Amplify CKLA in Arizona to scores from users of all other programs in the state to answer the following questions:

- 1** Overall, is use of Amplify CKLA associated with on-track or even improved ELA performance on the Arizona state test, compared to use of other programs when controlling for selection bias?
- 2** For students from economically disadvantaged backgrounds, is use of Amplify CKLA associated with on-track or even improved ELA performance on the Arizona state test compared to use of other programs when controlling for selection bias?
- 3** For Latino students in Arizona, is use of Amplify CKLA associated with on-track or even improved ELA performance on the Arizona state test compared to use of other programs when controlling for selection bias?

Method

Participants

Because Evidence for ESSA (Every Student Succeeds Act) guidelines require at least 30 analysis units, the study used data from 31 schools and focused on grade 5 outcomes.

Table 1. Number of schools in the study

Grade of instructional materials	Number of Arizona schools in study
Grade 5	31

The study combined and analyzed results from two groups of students who were using Amplify CKLA for the first time. Group 1 began using Amplify CKLA in school year 2016–2017 and Group 2 began using Amplify CKLA in school year 2017–2018. The combined sample is described in the table below.

Table 2. Instruments and sample size

Initial year of Amplify CKLA use	Pre-use outcomes	Post-use outcomes	Number of schools	Number of students
2016–2017	2015–2016 AzMERIT	2016–2017 AzMERIT	19	1,918
2017–2018	2016–2017 AzMERIT	2017–2018 AzMERIT	12	883
		Total	31	2,801

Instruments

The study measured the performance of students before and after use of Amplify CKLA using the Arizona state test, the AzMERIT: a computer-based standards-aligned state test for English Language Arts. The AzMERIT includes items that measure students' understanding at a range of Depth-of-Knowledge (DOK) levels and across all ELA standards strands (Arizona Department of Education, 2016). A sample Reading and Writing item from the AzMERIT grade 5 ELA test can be found in Appendix A. Additional sample items can be found on the AzMERIT portal at [AzMERITportal.org](https://www.azmeritportal.org).

Table 3. Percent of content of grade 5 ELA test at each DOK level

DOK 1	DOK 2	DOK 3	DOK 4
10–20%	50–60%	15–25%	13–19%

Table 4. Percent of content of grade 5 ELA test covering standards strands

	Minimum	Maximum
Reading Standards for Literature	26%	35%
Reading Standards for Informational Text	26%	35%
Reading for Informational Text	22%	26%
Listening Comprehension	0%	13%
Writing and Language	26%	38%
Writing	13%	19%
Language	13%	19%

The AzMERIT ELA test reports include ELA Scaled Scores as well as performance levels. During standard-setting, the scaled scores are cut into performance levels that align with each of Arizona’s four performance levels: Minimally Proficient, Partially Proficient, Proficient, and Highly Proficient.

Any student whose scaled score falls in the Proficient or Highly Proficient range is qualified as passing. The percent of students in each school who were qualified as passing based on the AzMERIT performance level after use of Amplify CKLA was used as the dependent variable and the percent of students in the school who were qualified as passing in the previous year was used as a control, along with background characteristics about the school.

To ensure that the description of Amplify CKLA’s impact is as accurate and generalizable as possible, it is important that the outcome measures have well-documented and acceptable psychometric properties. American Institutes for Research, in collaboration with the Arizona Department of Education, provides information on the psychometric properties of the AzMERIT each year in the annual technical report (AIR 2017a, AIR 2017b, AIR 2018).

Reliability describes the degree to which the results of the test are consistent and would be similar if the test were to be given again or if the student were to be given a different form of the test. In high stakes testing, reliability of around 0.90 and above is considered acceptable.

Internal consistency is used to describe how consistent the test items are. The internal consistency reliability for the grade 5 ELA tests is consistently 0.90 or above, as shown in Table 5. However, when performance levels are used as the outcome of interest, reliability should also be described in terms of decision accuracy and consistency, or the reliability of placing students into a certain performance level. The decision accuracy and consistency estimates for the grade 5 AzMERIT ELA performance levels are also provided in Table 5.

Accuracy refers to the degree to which the student is placed in the correct level based on their true ability, which can only ever be estimated, and consistency refers to the degree to which the student is placed in the same level they would be if given a different form of the test. As shown in Table 5, both are reasonably high, so it can be assumed that the performance level classification students receive on the AzMERIT is reliable. Checking these indices again helps to support claims made about the impact of Amplify CKLA as measured by student performance levels.

Table 5. Psychometric properties of AzMERIT grade 5 ELA scores and performance levels

	2015–2016	2016–2017	2017–2018
Internal Consistency reliability	0.90	0.90	0.90
Partially Proficient accuracy	0.92	0.92	0.93
Proficient accuracy	0.92	0.92	0.91
Highly Proficient accuracy	0.94	0.95	0.94
Partially Proficient consistency	0.89	0.89	0.90
Proficient consistency	0.88	0.89	0.88
Highly Proficient consistency	0.92	0.93	0.92

Results

The results show that Amplify CKLA was associated with positive outcomes for students overall (+0.26 effect size), as well as positive outcomes for economically disadvantaged students (+0.28 effect size) and Latino students (+0.38 effect size), who represent the largest minority student group in Arizona.

Information on the percentage of students in each performance level, which is made available to the public by the Arizona Department of Education after each testing season, was retrieved from azed.gov/accountability-research/data for the 2015–2016, 2016–2017, and 2017–2018 school years. This information was merged with a database of Amplify CKLA customers so that the average performance for Amplify CKLA customers and non-Amplify CKLA customers in Arizona could be compared.

To ensure that the groups of customers and non-customers were comparable, the pre-use outcomes for both groups were compared overall, and for each subgroup for which Arizona provides average performance levels. By law, averages for subgroups must be reported when that subgroup represents 10% or more of the school population.

Therefore, average scores were not provided for the following subgroups in any of the Amplify CKLA customer schools, and analysis of Amplify CKLA's impact in these subgroups could not be completed

- American Indian/Alaskan Native
- Asian
- Native Hawaiian/Other Pacific Islander
- Homeless
- Migrant

Average scores for the following subgroups were provided in fewer than 30 schools, and analysis of Amplify CKLA's impact in these subgroups was not conducted since Evidence for ESSA required at least 30 treatment units:

- Black
- Limited English Proficiency
- Multi-racial

Overall, and in the remaining subgroups, no significant differences in pre-use outcomes were found. The percentage of students qualified as passing based on their AzMERIT grade 5 ELA scores was similar for Amplify CKLA-using schools and non-using schools overall for economically disadvantaged students and for Latino students.

Table 6. A comparison of pre-use differences

Subgroup	School type	Number of school	Min % passing before use	Max % passing before use	Average % passing before	Standard deviation % passing before
Overall	Amplify CKLA users	2,147	0	98	45.51	19.90
	Non-users	31	13	84	48.42	21.21
t = -1.28, df = 30.77, p-value = 0.21						
Economically disadvantaged	Amplify CKLA users	1,593	0	100	35.53	15.78
	Non-users	30	11	88	38.33	17.86
t = -0.85, df = 29.86, p-value = 0.40						
Latino	Amplify CKLA users	1,751	0	100	37.23	17.35
	Non-users	31	10	85	42.55	19.98
t = -1.47, df = 30.81, p-value = 0.15						

Next, models predicting outcomes after a year of Amplify CKLA, controlling for baseline outcomes and demographic characteristics of the school. These models predicted the percent of students qualified as passing post-use, controlling for the percent of students qualified as passing before use as well as for the demographic variables. The demographic variables included the percent of economically disadvantaged students in grade 5 in the school, the percent of minority students in grade 5 in the school, and the percent of female students in grade 5 in the school.

The results table below shows the unstandardized regression coefficients, which represent the measures in their original scale as well as the standardized regression coefficients, which can be used as effect sizes.

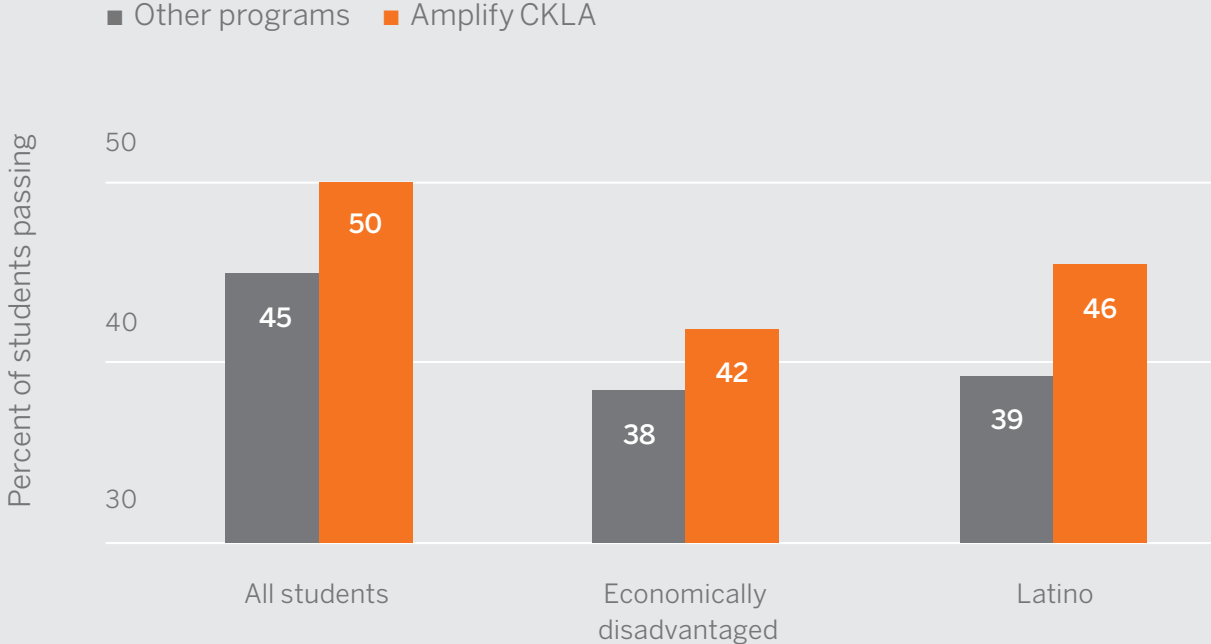
Table 7. Unstandardized and standardized results

	Model 1: Overall averages			Model 2: Economic disadvantage averages			Model 3: Latino averages		
	Estimate	SE		Estimate	SE		Estimate	SE	
(Intercept)	29.83	2.81	***	27.14	3.52	***	35.08	3.86	***
Amplify CKLA	5.28	1.91	**	4.48	2.58		6.83	2.65	*
Previous performance	0.66	0.02	***	0.54	0.03	***	0.46	0.03	***
Economic disadvantage	-13.62	1.59	***	-10.42	1.97	***	-19.09	2.23	***
Minority	-6.91	1.67	***	-7.77	2.33	***	-6.03	2.66	*
Female	-3.55	4.21		4.07	5.99		4.23	6.57	
(Intercept)	0.04	0.02	**	0.10	0.03	***	0.05	0.03	.
Amplify CKLA	0.26	0.09	**	0.28	0.16		0.38	0.15	*
Previous performance standardized	0.65	0.02	***	0.53	0.03	***	0.45	0.03	***
Economic disadvantage standardized	-0.18	0.02	***	-0.17	0.03	***	-0.29	0.03	***
Minority standardized	-0.07	0.02	***	-0.10	0.03	***	-0.07	0.03	*
Female standardized	-0.01	0.01		0.02	0.02		0.02	0.02	
	Adjusted R-squared: 0.75			Adjusted R-squared: 0.45			Adjusted R-squared: 0.49		

For all three models, the use of Amplify CKLA was a positive predictor. The results from the overall model show that Amplify CKLA was a significant positive predictor, describing an average difference of +5.28% of students being qualified as passing (effect size +0.26, **p < 0.01). The results from the model for economically disadvantaged students show that Amplify CKLA was a positive but not significant predictor, describing an average difference of +4.48% of students being qualified as passing (effect size +0.28, p < 0.10), and the results from the model for Latino students show that Amplify CKLA was a significant positive predictor, describing an average difference of +6.83% of students being qualified as passing (effect size +0.38, *p < 0.05).

The results from these models can be used to illustrate comparisons for an average Arizona grade 5 that is 64% economically disadvantaged, 48% minority, and 49% female. The results show that, on average, a similar school using Amplify CKLA might qualify 50% of all students as passing, whereas a non-using school would qualify 45% of students as passing. In these same schools, 42% vs. 38% of economically disadvantaged students would be qualified as passing, and 46% vs. 39% of Latino students would be qualified as passing.

Outcomes for Amplify CKLA vs. other programs



Discussion

The study investigated the following questions:

- 1** Overall, is use of Amplify CKLA associated with on-track or even improved ELA performance on the Arizona state test, compared to use of other programs when controlling for selection bias?
- 2** For students from economically disadvantaged backgrounds, is use of Amplify CKLA associated with on-track or even improved ELA performance on the Arizona state test compared to use of other programs when controlling for selection bias?
- 3** For Latino students in Arizona, is use of Amplify CKLA associated with on-track or even improved ELA performance on the Arizona state test compared to use of other programs when controlling for selection bias?

The results show that Amplify CKLA was associated with positive outcomes for students overall (+0.26 effect size), as well as positive outcomes for economically disadvantaged students (+0.28 effect size) and Latino students (+0.38 effect size), who represent the largest minority student group in Arizona.

This study meets the guidelines for the Evidence for ESSA Promising Evidence category, as a correlational study that adjusts for selection bias with at least 30 treatment units in multiple sites. Publicly available data does not include student-level scores, so impact of Amplify CKLA on individual student growth cannot be described. In addition, publicly available data does not include teacher- and class-level variables, so clustering of student outcomes within classes cannot be considered. Further research into the impact of Amplify CKLA should include an analysis of student- and class-level data to better describe its impact.

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Appendix A

Example AzMERIT grade 5 Reading item

Grade 5 ELA–Reading Sample Test

Item Number	Strand	Cluster	Content Standard	DOK
1	Reading for Informational Text	Craft and Structure	RI.5.4	2

Passage(s):

- The Creator of Oz*

Read these sentences from the passage.

"Later he explained how he suddenly became inspired by this special tale. 'I was sitting in the hall, telling the kids a story, and suddenly this [tale] moved right in and took possession. I shoed the children away, and grabbed a piece of paper that was lying there on the rack, and began to write.'" (paragraph 11)

What does the word inspired mean?

A bored by something

B afraid of something

C full of ideas about something

D brave enough to do something

(1 Point)

Example AzMERIT grade 5 Writing item

Grade 5 ELA–Writing Sample Test

Item Number	Strand	Cluster	Content Standard	DOK
1	Writing	Text Types and Purposes	W.5.2a	4

Passage(s):

- A Light Pollution Study Near You*
- Sources of Light Pollution*
- Light Pollution*
- Cop Saves Sea Turtles Hatching at Florida Resort*

Write an informative essay to present to your class about the problem of light pollution in the United States today. Use information from the passages in your essay.

Manage your time carefully so that you can

- read the passages;
- plan your response;
- write your response; and
- revise and edit your response.

Be sure to include

- an introduction;
- information from the passages as support; and
- a conclusion that is related to the information presented.

Your response should be in the form of a multiparagraph essay. Write your response in the space provided.

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