



# Impact Report:

# South Pike School District

Magnolia, Mississippi (2022-23)

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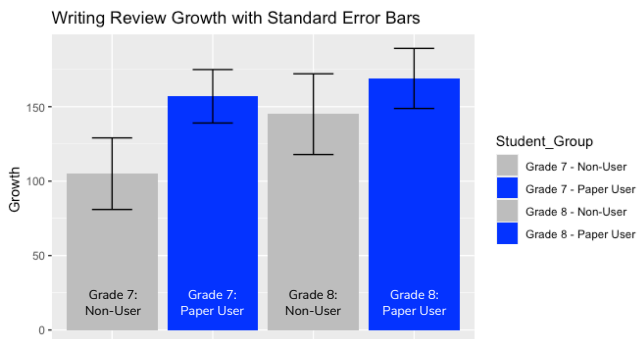
# Executive summary

To study the effects of Paper on students in grades three through eight, the Paper Impact team conducted a quasi-experimental study in collaboration with South Pike School District (SD) in Mississippi. Researchers examined the academic progress of over 500 students during the 2022-23 school year, as measured by their i-Ready assessments.

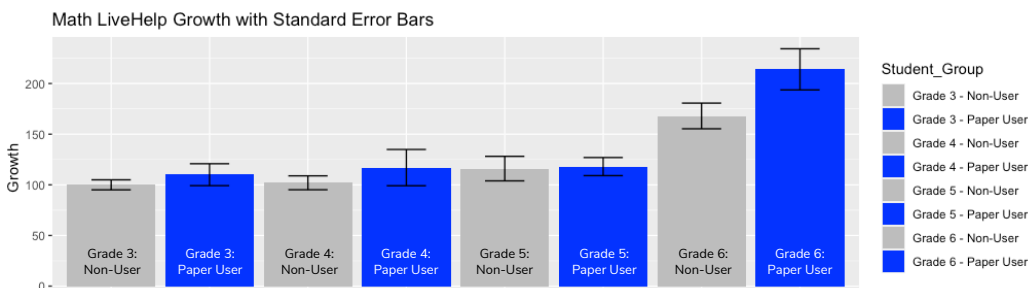
This study revealed that students in grades seven and eight who used Paper’s Review Center grew 31% more toward their annual growth goals in ELA compared to students who did not. Additionally, for every Paper Live Help session in math students received, third through sixth graders grew 3% more toward their annual goal. The study also determined that students in grades three through six who used Paper’s Live Help feature at least once for math tutoring grew 9% more on their i-Ready math score compared to students who did not use Paper. Lastly, students in grades three through six who used Paper Missions grew 8% more compared to students who did not use the feature.

These results are particularly encouraging given that these students engaged in light to moderate usage, suggesting that even a few sessions can positively impact student learning.

However, it’s important to acknowledge the study’s limitations. Although covariates were used for the analysis, sample sizes were too small to determine the effect Paper usage had on subgroups such as race, and gender. These are important contextual factors that influence learning and opportunities. The study also lacks randomization or covariate variables controlling for teacher implementation and teacher quality.



Because these findings demonstrate a significant positive correlation between usage of Paper and academic outcomes, researchers recommend a larger number of students in the district use Paper more frequently. Increased usage will enable a better understanding of dosage by subgroups. Researchers also recommend inclusion of FRL data in future reports to better control for selection bias.



# Introduction

Paper is an Educational Support System (ESS) designed to address students' developing needs throughout their academic journeys.

The ESS is an adaptive learning platform that supports students on their learning and discovery journeys across grades and subjects. Paper helps students master skills, complete assignments, and make connections among areas of study and future careers. Likewise, Paper supports students as they create and adjust their academic plans for postsecondary success.

Specifically, Paper offers interactive and independent practice opportunities in math, reading, vocabulary, and video (Paper Missions); expert writing feedback on a wide variety of content (Review Center); and on-demand tutoring for personalized academic support (Live Help). These features enable students to access academic resources whenever and wherever they need.

**This study sought to answer the following research questions:**

1. What was the rate of Paper adoption by South Pike SD students?
  - a. How did that adoption vary by activity type (Review Center, Live Help, and Paper Missions)?
  - b. How did that adoption vary by grade level?
  - c. How did adoption vary by race and gender?
2. How does Paper usage (Live Help, Paper Missions, Review Center) affect student academic achievement as measured by i-Ready benchmarks used by the district?

## Study design and methods

The study used a quasi-experimental design to understand growth toward annual goals as measured through i-Ready benchmark scores, comparing students who used Paper during the 2022-23 school year to students who did not use Paper. A quasi-experimental design measures the impact of an intervention by comparing those who use the intervention to those who do not while controlling for covariates known to influence outcomes (such as gender, race, and grade level). Students who used Paper during the school year were part of the intervention group, and students who did not utilize Paper were part of the comparison group.

# Implementation of Paper

## Product descriptions

Paper’s Review Center allows students to upload many kinds of written work for expert feedback—from essays to lab reports and résumés. Paper tutors review students’ drafts asynchronously and provide feedback on style, grammar, plagiarism, adherence to rubrics, and similar elements.

Paper’s Live Help instantly connects students with tutors who support them in studying for tests, completing assignments, exploring new topics, and more. Unlimited help is available across many subjects and in multiple languages—anytime, anywhere.

Paper Missions enables students to practice various math and vocabulary concepts at a self-directed pace. The experience celebrates students as they complete different sets of practice problems and exercises.

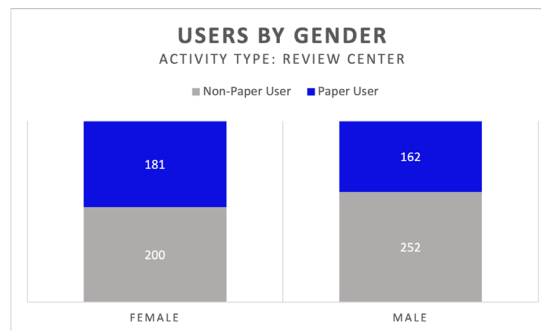
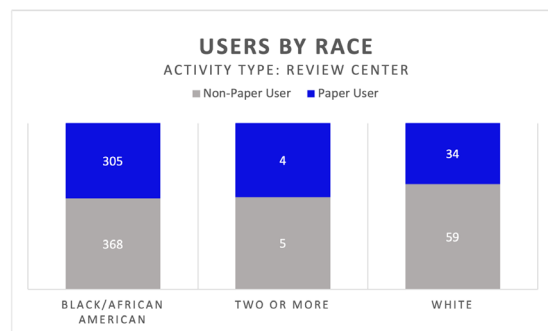
## Implementation

In seventh grade, the intervention group (n=176) and the comparison group (n=167) were roughly equivalent. In eighth grade, 40% of students used Paper (n=167), compared to the comparison group of 60% (n=253). Black students used Paper (45% of all Black students at South Pike SD) more than white students (37% of all white students at South Pike SD). Fewer male students (39% of all male students) used Paper than female students (48% of all female students).

The following table and graphs describe the adoption rate by activity type, grade, race, and gender.

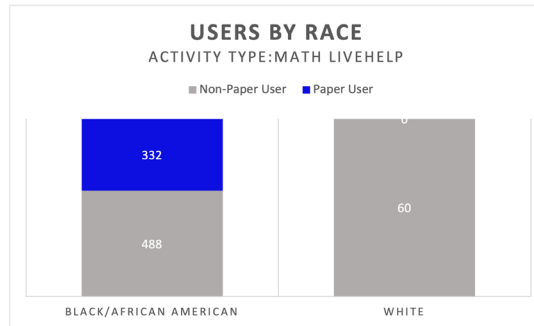
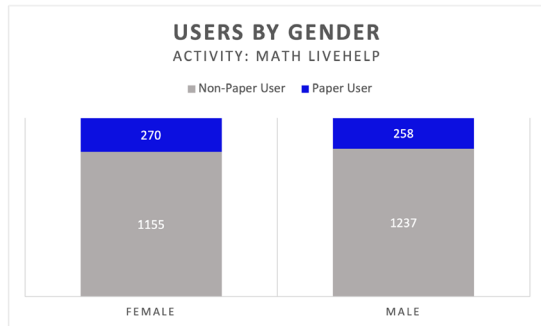
### Review Center usage details

Grade	Non-Paper user	Paper user	Range	Average
7	199	176	1-11	2
8	253	167	1-7	3



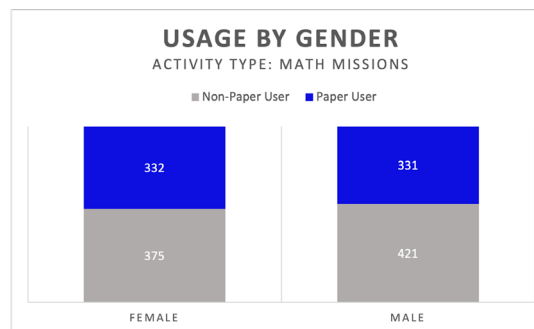
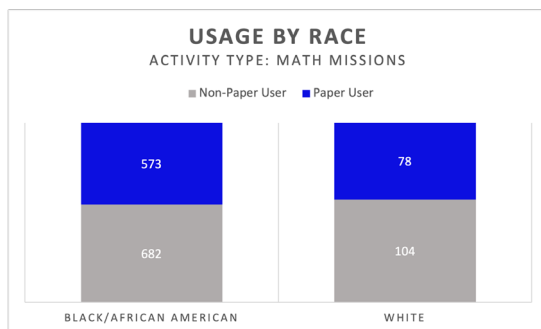
### Math Live Help usage details

Grade	Non-Paper user	Paper user	Range	Average
3	214	58	1-7	1.8
4	164	45	1-5	2.5
5	57	158	1-3	5.8
6	119	136	1-6	3



### Paper Missions usage details

Grade	Non-Paper user	Paper user	Range	Average
3	309	109	4-717	106
4	187	133	2-711	92
5	124	207	4-5,065	590
6	176	214	3-740	197



# Measures

## iReady benchmark scores

To gauge success, the district shared i-Ready benchmark information such as percentiles, diagnostic scores and gain, annual and stretch goals, growth toward goals, and overall placement.

These i-Ready benchmarks are targeted digital assessments that ensure educators can understand students’ performance in reading and math, specifically across grades two through eight. i-Ready provides an annual growth goal informed by, “the average growth of students at each grade and placement level. Typical growth allows you to see how a student is growing compared to average student growth at the same grade and baseline placement level.”<sup>1</sup> It’s expected that students will meet 100% of their goals during the school year, as measured by their benchmark scores. This means that a student has made a year’s worth of expected progress compared to other students that started in the same grade and baseline academic level. There were three periods of testing for students—beginning, middle, and end of year—as indicated by the assessment date. The study uses growth toward annual goals and diagnostic gain as outcome measures.

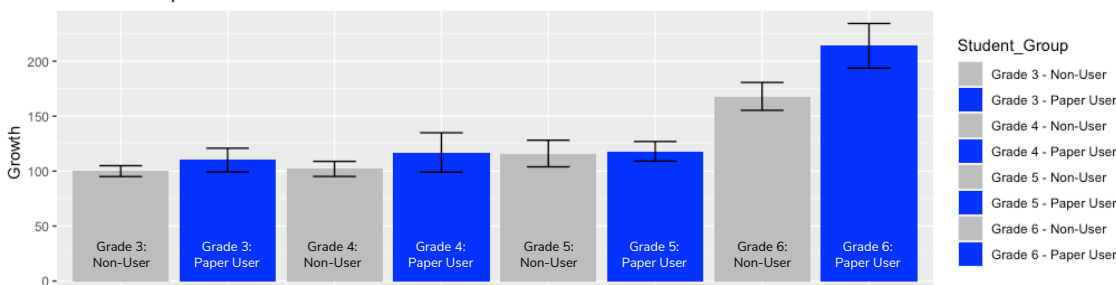
# Findings

## Live Help (math tutoring)

Students who used Paper’s Live Help for math support grew 9% more toward their annual goal than students who did not. Paper users averaged 130% (compared to 121% for nonusers) of growth toward their goals.

Each Live Help tutoring session for math is associated with a 3% increase in growth toward students’ annual goals. Sixth grade students saw particularly significant effects, with Paper users growing 214% toward their annual goals, compared to 168% for those who didn’t use Paper. Although this suggests that all South Pike SD sixth grade students demonstrated impressive growth, those who leveraged Paper’s math tutoring were able to accelerate their math growth by an additional 46%.

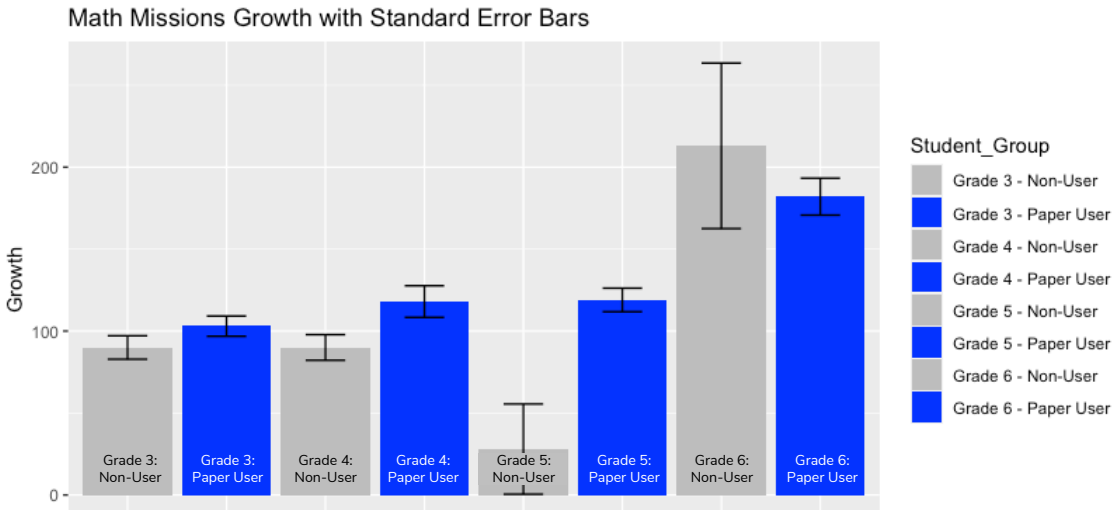
Math LiveHelp Growth with Standard Error Bars



<sup>1</sup> Curriculum Associates, “Using Growth and Proficiency Data,” i-Ready Central, 2023, [https://i-readycentral.com/download/?res=20481&view\\_pdf=1](https://i-readycentral.com/download/?res=20481&view_pdf=1).

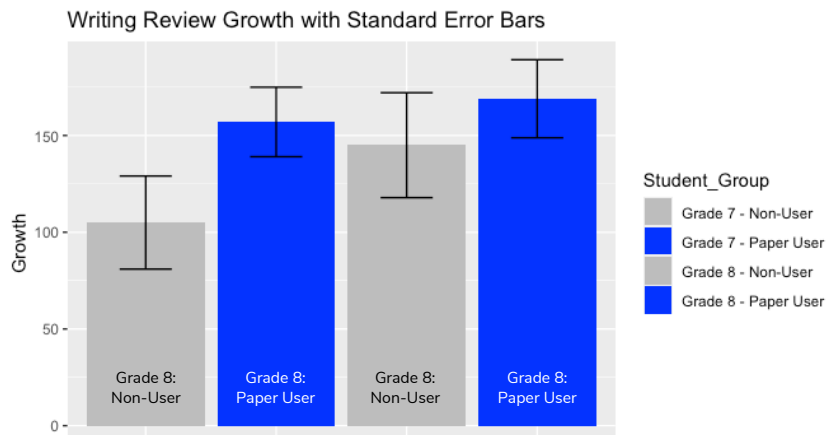
## Paper Missions (math practice)

Students in grades three through six who used Paper Missions (n=796) to practice math averaged 8% more growth for the 2022-23 school year toward their annual goals in math, compared to students who did not use Paper Missions (n=458).



## Review Center (writing feedback)

Students in grades seven and eight who used Paper’s Review Center to improve their writing skills grew 31% more toward their annual growth goals in ELA, compared to students who did not.



## Discussion

For students who utilized Paper’s Review Center, Live Help, and Paper Missions, there was significant improvement in their growth as measured by i-Ready benchmark assessments. This means students who used Paper gained more ground toward being on or above grade level as compared to peers who did not use Paper. Given that the annual growth goals take into account where students started, the data suggests that students of all abilities have their learning accelerated by using Paper.

This is especially promising given the light to moderate use of Paper. On average, students used Paper’s Review Center once and Live Help three times during the 2022-23 school year. Researchers determined that launching three tutoring sessions in math, results in over one point of gain from the diagnostic score for students on the i-Ready benchmark. In turn, more consistent use of the Review Center and Live Help has the potential to increase ELA and math scores.

## Limitations

There are three main limitations in this quasi-experimental study: unequal group size, variation in teacher implementation, and student self-selection bias.

- **Unequal group sizes:** This is a limiting factor in understanding the full impact Paper can have on students. In some of the activity types (i.e., Review Center for third through sixth graders and Paper Missions for seventh and eighth graders), the groups of users versus nonusers were unbalanced, which could potentially lead to unequal comparisons and greater margin of error. This also led to a limited ability to analyze by subgroup, leading to no statistically significant results for subgroups such as gender or race.
- **Teacher implementation:** Teacher effectiveness is one of the leading indicators of student academic achievement,<sup>2</sup> but this study did not control for the wide variation in teacher implementation of Paper. In simple terms, excellent educators could be a driver of these results.
- **Self-selection bias:** It is possible that students who opted to or were encouraged to use Paper’s ESS (or edtech more generally, especially in contexts outside of school) come from more privileged backgrounds. On the other hand, students who may have less support, knowledge, or encouragement to use ESS—often students who come from lower-income households, immigrant students, or students of color—may struggle to access or navigate edtech and similar academic resources. Without a larger sample size and variables to examine such factors, it is difficult to determine this self-selection bias.

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<sup>2</sup> James H. Stronge, Thomas J. Ward, and Leslie W. Grant, “What Makes Good Teachers Good? A Cross-Case Analysis of the Connection Between Teacher Effectiveness and Student Achievement,” *Journal of Teacher Education* (September 2011); <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=8b0b456eef40abea0670183ed8d69f89c36362be>



## Conclusions and recommendations

Paper was shown to have a statistically significant positive effect for students who used the Review Center for writing feedback, Live Help for math tutoring, and Paper Missions for math practice. With improvements on i-Ready benchmarks ranging from 8-31% among Paper users—even with limited individual usage—there is strong evidence that Paper is beneficial in growing students' academic skills enough to positively impact their academic performance and outcomes.

To build on this foundational understanding of the impact of Paper on students at South Pike SD, researchers recommend more consistent implementation of Paper for a larger, more representative group of students.

As noted in the limitations section, a larger and more representative sample size will help researchers examine relationships among student usage and outcomes more precisely and better determine whom Paper can most powerfully accelerate learning for.

## Thank you and recognition

This study was possible due to the exceptional work of South Pike SD under the leadership of Superintendent Dr. Angela Lowery. Special thanks is given to Technology Coordinator Andrei Jennings, Technicians Ray Givens and Candice Varnado, and Curriculum Director Jasmine Jackson. Thank you also to the wonderful educators Allison Flippin, Tammy Vielee, and Shameka Green, who shared their expertise, insights, and time. A deep gratitude is given to the community of South Pike SD for all it does on behalf of students. And of course, to the students of South Pike SD, thank you for your hard work, energy, and brilliance.

## Appendix A

### Math Live Help implementation

Grade	Time of year	Total students	Paper users	Time of year	Total students	Paper users
Grade 3	Midyear	143	51	End of year	133	7
Grade 4	Midyear	111	30	End of year	102	15
Grade 5	Midyear	111	86	End of year	108	72
Grade 6	Midyear	129	91	End of year	127	45
Grade 7	Midyear	122	2	End of year	118	27
Grade 8	Midyear	134	3	End of year	131	99

School	Time of year	Total students	Paper users	Time of year	Total students	Paper users
Eva Gordon Lower ES	Midyear	373	36	End of year	106	4
Eva Gordon Upper ES	Midyear	281	166	End of year	272	107
Osyka ES	Midyear	172	56	End of year	116	28
South Pike Junior HS	Midyear	256	5	End of year	249	126

Student subgroup	Time of year	Total students	Paper users	Time of year	Total students	Paper users
3 or more grade levels below	Midyear	140	19	End of year	105	60
2 or more grade levels below	Midyear	106	29	End of year	64	22
1 grade level below	Midyear	489	113	End of year	245	80
Early on grade level	Midyear	228	72	End of year	172	59
Mid or above grade level	Midyear	119	30	End of year	157	44
Female	Midyear	527	142	End of year	366	128
Male	Midyear	55	121	End of year	377	137
Asian	Midyear	1	1	End of year	2	0
Black or African American	Midyear	911	221	End of year	643	228
Two or more races	Midyear	16	4	End of year	10	4
White	Midyear	154	37	End of year	88	33

## Paper Missions implementation

Grade	Time of year	Total students	Paper users	Time of year	Total students	Paper users
Grade 3	Midyear	143	42	End of year	133	67
Grade 4	Midyear	111	80	End of year	102	53
Grade 5	Midyear	111	101	End of year	108	106
Grade 6	Midyear	129	96	End of year	127	118
Grade 7	Midyear	122	0	End of year	118	38
Grade 8	Midyear	134	0	End of year	131	3

School	Time of year	Total students	Paper users	Time of year	Total students	Paper users
Eva Gordon Lower Elementary School	Midyear	373	24	End of year	106	52
Eva Gordon Upper Elementary School	Midyear	281	232	End of year	272	219
Osyka Elementary School	Midyear	172	63	End of year	116	73
South Pike Junior High School	Midyear	256	0	End of year	249	41

Student subgroup	Time of year	Total students	Paper users	Time of year	Total students	Paper users
3 or more grade levels below	Midyear	140	27	End of year	105	21
2 grade levels below	Midyear	106	30	End of year	64	24
1 grade level below	Midyear	489	125	End of year	245	116
Early on grade level	Midyear	228	89	End of year	172	106
Mid or above grade level	Midyear	119	48	End of year	157	118
Female	Midyear	527	164	End of year	366	193
Male	Midyear	555	155	End of year	377	192
Asian	Midyear	1	1	End of year	2	2
Black or African American	Midyear	911	275	End of year	643	333
Two or more races	Midyear	16	4	End of year	10	5
White	Midyear	154	39	End of year	88	45

## Review Center implementation

Sample	Data range	Total students	Paper users	Non-Paper users	Average no. of activities	Range of activities
Elementary school (3-6)	Midyear	504	33	471	1.4	1-3
Elementary school (3-6)	End of year	472	7	465	1.1	1-2
Middle school (7-8)	Midyear	281	155	126	1	1-2
Middle school (7-8)	End of year	245	188	57	3	1-11

Grade	Time of year	Total students	Paper users	Time of year	Total students	Paper users
Grade 3	Midyear	145	31	End of year	133	0
Grade 4	Midyear	112	0	End of year	102	2
Grade 5	Midyear	115	1	End of year	108	3
Grade 6	Midyear	132	1	End of year	129	2
Grade 7	Midyear	138	79	End of year	118	97
Grade 8	Midyear	143	76	End of year	127	91

School	Time of year	Total students	Paper users	Time of year	Total students	Paper users
Eva Gordon Lower Elementary School	Midyear	376	31	End of year	184	0
Eva Gordon Upper Elementary School	Midyear	286	1	End of year	274	6
Osyka Elementary School	Midyear	175	1	End of year	162	1
South Pike Junior High School	Midyear	273	155	End of year	245	188

### Review Center implementation (continued)

Student subgroup	Time of year	Total students	Paper users	Time of year	Total students	Paper users
3 or more grade levels below	Midyear	190	52	End of year	156	68
2 grade levels below	Midyear	135	20	End of year	82	24
1 grade level below	Midyear	351	50	End of year	219	44
Early on grade level	Midyear	242	39	End of year	199	33
Mid or above grade level	Midyear	192	27	End of year	219	26
Female	Midyear	537	98	End of year	424	106
Male	Midyear	573	90	End of year	441	89
Asian	Midyear	1	0	End of year	4	0
Black or African American	Midyear	936	166	End of year	747	171
Two or more races	Midyear	16	3	End of year	10	2
White	Midyear	157	19	End of year	113	22