Hilin Mu Program Evaluation Results – 2019-2021

Context: Niger has one of the world's highest rates of early marriage and lowest rates of female literacy. One in three girls is married before the age of 15, and three in four girls before the age of 18 (UNICEF). It is very uncommon for a girl to stay in school after marriage, so high rates of early marriage mean girls drop out early. School enrollment is markedly low and, as with the rate of early marriage, is particularly pronounced in the Maradi region. Just 33% of girls are enrolled in lower secondary school and 6.6% in upper secondary school in Maradi (Ministry of Secondary Education, 2017-2018). Niger's education system requires students to achieve a minimum cumulative test score average in Grade 5[1] (the final year of primary school, known as CM2 in the French system) in order to advance to secondary school. Many students do not meet this threshold, and they only have one chance to repeat a school year before being permanently excluded from the public system. This leaves a large proportion of girls prematurely pushed out of schools based on test scores every year. Lack of education leaves women with few career choices outside of marriage and child rearing. The absence of viable alternatives to child marriage makes it difficult for girls and their families to envision a different life path.

Program Description: The Hilin Mu program aims to address girls' dropout, early marriage, and risks of maternal mortality by supporting the transition of girls from primary to secondary school. Hilin Mu provides safe space clubs to girls enrolled in their last year of primary (grade 5) and first year of secondary school (grade 6). The program's goal is to help girls continue schooling and delay marriage by building their literacy, numeracy and critical life skills. A safe space is a mentored girls' club that creates a place where girls feel secure, connect with other girls, gain life skills and bridge gaps in academic learning. Participation enhances girls' core academic competencies, especially literacy, and leads to improved school performance. Club members make friends, expand their social networks, share aspirations and concerns, visit local health services, and much more. The clubs are facilitated by female teachers who serve as role models, share their lived experiences, offer advice, and foster a welcoming environment for girls to learn and share. Parents see evidence of learning and growth and are more willing to pay school fees and let their daughters proceed further in their studies before marriage. Hilin Mu supports girls as they physically and emotionally mature, gain a greater sense of self, and acquire capabilities – like negotiation and self-expression - that are valuable to shaping their aspirations and ability to achieve them.

Details of the Intervention:

Hilin Mu is a two-year program that serves girls in their last year of primary school (grade 5) and continues through the end of their first year in secondary school (grade 6). Hilin Mu's activities include:

- An initial 3-day mentor training in pedagogy, mentoring techniques, and literacy and numeracy competencies, followed by approximately six one-day monthly trainings;
- Community dialogues and a religious leaders' workshop prior to groups' start-up;

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[1] In the Nigerien school system, CM2 is the final grade in primary school and equivalent to the U.S.' 5th grade. 6eme is the first grade in secondary school and equivalent to the U.S.'s 6th grade.

- Between 35-42 weekly two-hour safe space sessions facilitated by female school teachers (mentors), providing literacy, numeracy and life skills;
- Meals and school supply kits for participants during sessions;
- Supportive supervision visits to mentors, with each club being supervised approximately twice a month.

Evaluation Objectives:

This evaluation aimed to assess the impact of the Hilin Mu program on girls' school enrollment, literacy and numeracy competencies, primary school graduation rates and transition rates to secondary school. Ultimately, the program's impact on junior and upper secondary graduation rates and age of marriage will also be assessed. However, the current evaluation focused on the intermediate outcomes given that the girls assessed had only recently participated in the program and had not yet advanced to the final years of junior and upper secondary school.

Evaluation Methods:

Using a quasi-experimental design, the evaluation analyzed data for a total of 1,046 program participants and 786 comparison girls who entered the program or evaluation during the 2019-2020 or 2020-2021 school years. Participants in the study were selected based on their school having met all inclusion criteria. Eligible schools were then matched by similarities in selection criteria, and intervention or comparison status was randomly attributed within each pair. All girls enrolled in grade 5 in the selected schools were eligible to participate if they and their parents provided informed consent. Table 1 indicates the number of schools and girls included in the evaluation by entry year.

Table 1. Number of Schools and Girls in Sample, by Year

Entry Year	Number of schools	Number of intervention girls	Number of comparison girls
2019	28 (14 intervention & 14 comparison)	503	395
2020	34 (17 intervention & 17 comparison)	546	391

Grade 5 data was available for both cohorts and was pooled for analysis; grade 6 was only available for the 2019-2020 cohort and thus analysis was done for that cohort only. The cohorts for which data was available for analysis are shown in Table 2.

Table 2. Entry and School Years for Available Data

	School Year	
Entry Year	Grade 5 (CM2)	Grade 6 (6e)
2019	☑	☑
2020	☑	☒

These results pull from three different sets of data to construct outcomes:

- <u>French literacy and math tests conducted by the evaluation team.</u> There are two versions of this test, one of which is administered at the beginning and end of grade 5, and one of which is administered at the beginning and end of grade 6. Scores are out of twenty points on each exam, with a total possible score of forty between the two. The test administered at the beginning of grade 5 is referred to in this report as the "baseline".
- <u>Tests conducted by the school personnel, which includes three exams in grade 5 and two exams in grade 6.</u> The results from these exams are used by the school district to determine whether the girl advances or is required to repeat the grade. For grade 5, these tests are out of ten points each, meaning the average is a score out of ten. For grade 6, the tests are out of twenty points each. A girl who does not attend the exam automatically records a zero.
- <u>School transition rates collected by supervisors</u>. These measure dropouts based on information gathered at the girl's primary or secondary school.

In addition to assessing impact on the above-mentioned outcomes, the evaluation also assessed whether the program was equally beneficial to all girls or if it differed based on their academic competency level at the start of the program. The sample was split into five groups based on their baseline test scores, from lowest to highest, in order to look at the effects of Hilin Mu separately for each group of girls.

Results:

<u>Overview</u>

The results in this report used a multivariate linear regression to evaluate the impact of the Hilin Mu intervention on girls' school enrollment and performance from 2019 to 2021. Findings showed that:

Literacy and math competency among participants was 23% and 27% higher than the comparison group after one year, respectively, as measured by the post-tests administered by the program team. This rose to 46% and 29% higher than the comparison group after two years.

Test scores on school exams were 16% higher for participants than the comparison group, translating to Mu participants being 13% more likely to pass their final year of primary and continue to secondary school.

Hilin Mu increased girls' likelihood of staying in school by close to 30% after two years, as measured by comparing transition rates.

<u>Baseline</u>

The pre-test in literacy and math, administered by the program team at the start of Grade 5 to intervention and comparison girls, was used to establish the baseline for the evaluation. This internal assessment was used rather than school exam scores given the latter's unreliability. There were occasions of dramatic variation within a single school across school years that suggested school exam results may not accurately reflect the actual level of the students.

Overall, the baseline data suggests treatment and control schools are somewhat balanced, with some caveats. Across the two cohorts, there is a weak increase in the likelihood of taking the baseline in treatment schools, roughly 5.3 percentage points. This corresponds to a roughly 6% increase in the likelihood that treatment girls take the exam, relative to the 91% of comparison girls who did so. There are no meaningful differences in scores on the exams in the aggregate, although Appendix Table A1 shows that in the 2020 cohort, treatment girls scored roughly .9 points lower on math; no other test score differences are statistically significant. Overall, however, the test scores as shown in Table 3 suggest balance between the treatment and control group on knowledge levels, which is likely the most important criteria for balance overall. In all subsequent tables, literacy is referred to as "French".)

Table 3. Baseline Balance

|	Took Baseline	Math Score	French Score	Repeated CM2
Intervention	0.053**	-0.309	-0.388	-0.037**
	(0.021)	(0.335)	(0.462)	(0.017)
Observations	1644	1557	1559	792
Control Mean	0.91	8.90	9.09	0.11
Pair FE	Yes	Yes	Yes	Yes
Cohort	Pooled	Pooled	Pooled	2020

$^{*}\ p < 0.10,\ ^{**}\ p < 0.05,\ ^{***}\ p < 0.01$

Literacy, Math and School Exam Midline Results

After one year of Hilin Mu, girls took part in an assessment of core learning areas, as well as a school-administered exam. This demonstrated that program participants' learning outcomes improved across two areas assessed by the program: French and Math relative to comparison girls. In addition, there were smaller gains in quarterly exam scores administered by schools.

Figure 1 compares the results of the program-administered pre and post-tests as well as the quarterly school exams for Hilin Mu participants and comparison of girls in grade 5. Data was pooled to include both the 2019-2020 and 2020-2021 cohorts. By the end of that year (which was the first year of the two-year program), Hilin Mu participants' literacy scores were 23% (2.4 points out of 20*) higher than the control group, and 27% (2.7 points out of 20*) higher in math. Quarterly school exam scores were 16% (0.75 points out of 10**) higher among participants compared to girls in the control schools. This translates to Hilin Mu participants being 13% more likely to pass CM2 and continue on to secondary school, a 27% increase relative to the 47% of girls that progressed in the control group. Statistical significance is indicated by the confidence interval at the top of each bar of the graphs; it is significant if the line crosses the bar. Regression analysis results are presented in Appendix Table A2.

Figure 1: Midline results – French & Math scores and school exam results in last year of primary school (Grade 5, or "CM2")
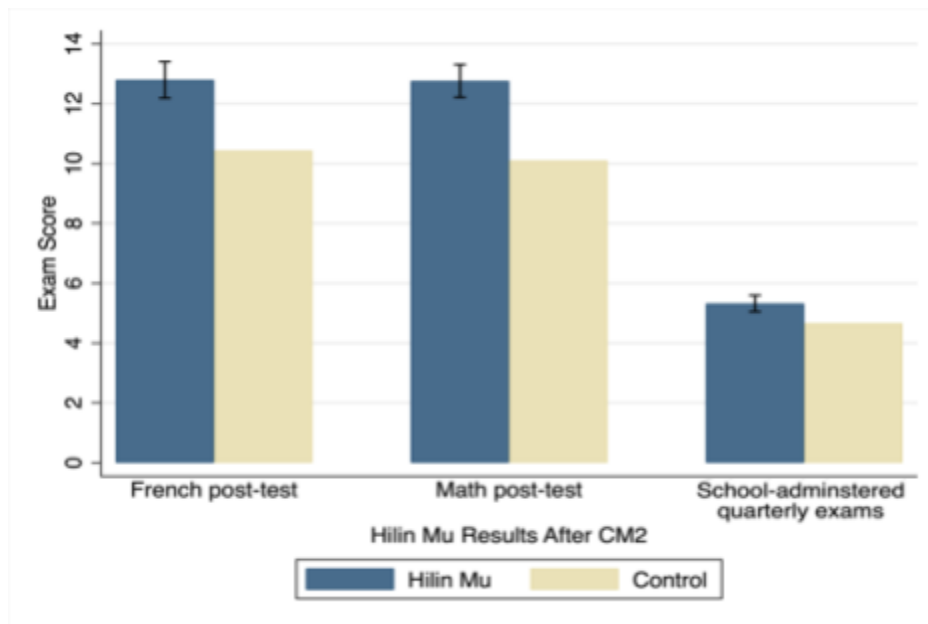
* French and math scores were measured by comparing post-tests administered by the program team for the intervention and comparison groups; each subject is out of 20 points.
** Primary school exam scores reported by school districts ("Inspections") for the intervention and comparison schools. This is the average of three exams taken over the course of the year; each exam is out of 10 points.

Results disaggregated by cohort are in Appendix Table A3. Overall, the 2020 cohort saw larger increases in French scores, math scores, and school exam scores than the 2019 cohort; however, the change in likelihood of passing to the next grade level was almost the same between the two years.

Math, French and School Exam Endline Results

At the start of their second year in the program (grade 6), there were no meaningful differences between Hilin Mu participants and the control group in the literacy and math pretest. These results are surprising, as these girls scored higher on the literacy tests at the end of grade 5 and the school-administered tests at the end of grade 5, taken only a few months before. The results suggest that, potentially, Hilin Mu participants were unable to apply their new knowledge to this new, different test initially (and so received the same scores as control girls), or that there is an issue with the reliability of the data collected. By the end of the year, however, as is discussed below, their scores do increase more than the control girls' scores.

By the end of the second year, Hilin Mu participants' scores were 46% (3.3 points*) higher than the control group in literacy, and 29% (2.3 points*) higher in math (Figure 2). They also saw an increase in the biannual school exam scores of 20% (1.5 points**) compared to the control group. Regression analysis results are presented in Appendix Table A4.

Figure 2: Endline results - French & Math scores and school exam results in first year of secondary school (Grade 6, or "6e")
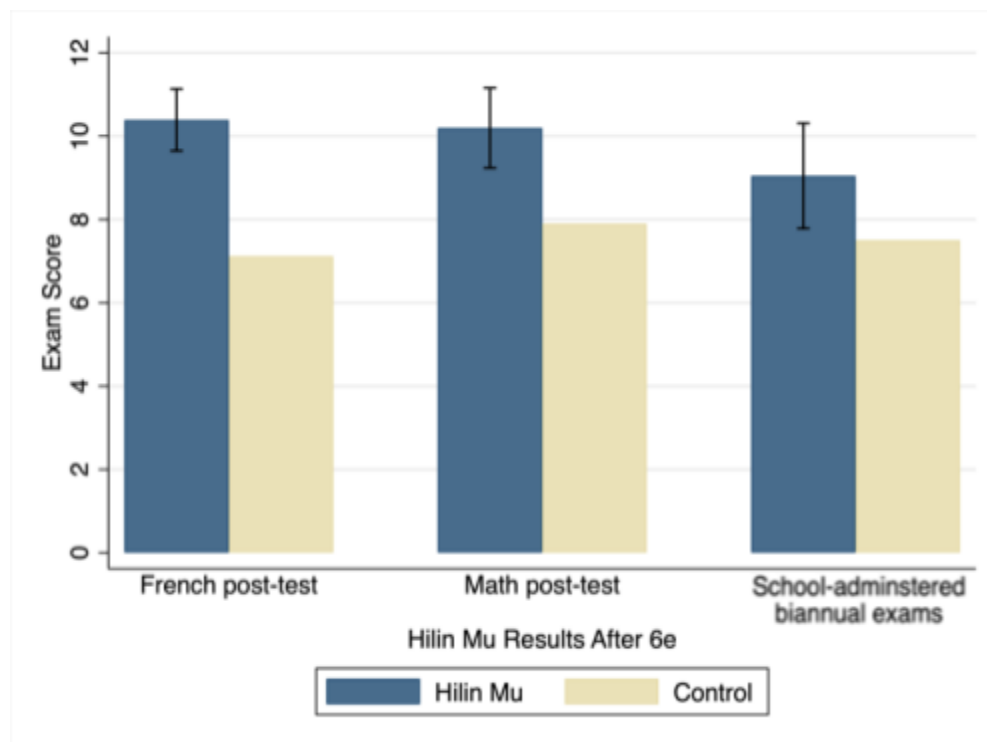
* French and math scores measured by comparing post-tests administered by the program team; each subject is out of 20 points.
** Primary school exam scores reported by school districts ("Inspections"); this is the average of two exams taken over the course of the year; each exam is out of 20 points.

School Retention Rates

Along with functional improvements in skills, Hilin Mu participants were more likely to successfully transition to secondary school than comparison girls. Among girls in Hilin Mu, nearly all (99%) were still enrolled in school after one year of the program, compared with 91% of comparison girls[2]. Girls in the intervention were more likely to score high enough on exams to transition to secondary school and, among those who did not pass, to remain in school through a repeated year.

Figure 3 shows that Hilin Mu participants were 7.5 percentage points more likely to still be in school at the end of grade 5.[1] 60% of girls who completed one year of Hilin Mu programming scored high enough on their exams to advance to secondary school. 40% had to repeat their last

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[2] As mentioned in the introduction, 33% of girls in Maradi are enrolled in lower secondary school (Ministry of Secondary Education, 2017-2018). This is the gross enrollment rate, or the ratio of the total number of pupils enrolled in a level of education regardless of their ages to the total population of official school age at this level. Our 99% and 91% calculations of enrollment were for the last year of primary, as opposed to lower secondary. The large difference between the last year of primary and lower secondary enrollment rates can be explained in part by the large percentage of girls that drop out after their first year of secondary school due to low test scores.

year of primary, while 53% of comparison girls were required to repeat. Of these girls who had to repeat, the Hilin Mu participants were 20 percentage points more likely to still be in school at the end of the repeated year relative to comparison girls.

By the end of grade 6, for the girls who had progressed, the percent increase of staying in school rises to 22 percentage points. This is an increase of 30% relative to the control group girls still enrolled, or an increase from 74% to 96% of girls not marked as having dropped out. Regression analysis results are presented in Appendix Table A5. By looking at repeaters and those who progressed to grade 6, we can estimate that there are roughly 128 girls (114 who progressed, and 14 repeaters) who would have dropped out between the beginning of 2019 and the end of 2021, but remained in school due to the Hilin Mu program, relative to the 594 total girls tracked over two years.

Figure 3: Proportion of girls staying in school
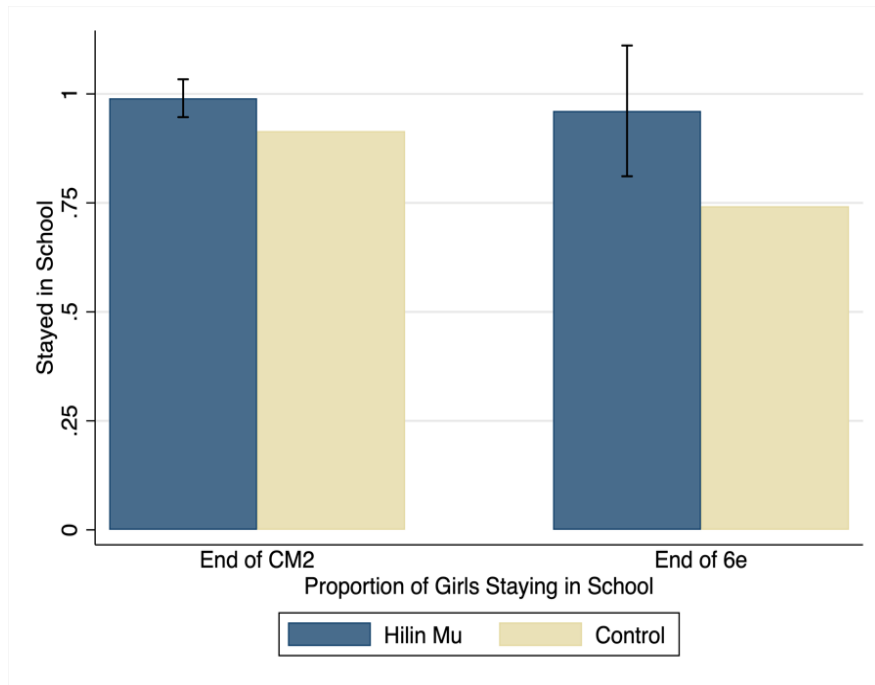
Program's Impact on Girls, by Academic Competency Level

The primary school results, in Figure 4 suggest that benefits of the intervention accrue across the distribution, with the largest gains seeming to be for girls with average (40th to 60th percentile) scores at baseline. The left hand side of the figure looks at effects of the intervention on average post-test scores in literacy and math; the right hand side looks at treatment effects on average school exam scores. The lower point estimates on the graph represent the average score in the control group; the higher point estimates represent the estimated treatment group scores, with confidence intervals indicated by the vertical lines running through the point. If the lines do not intersect the control group average, then the results are indicated to be statistically significant at the 95% confidence level.

Figure 4. Distribution of Primary School Results by Baseline Scores
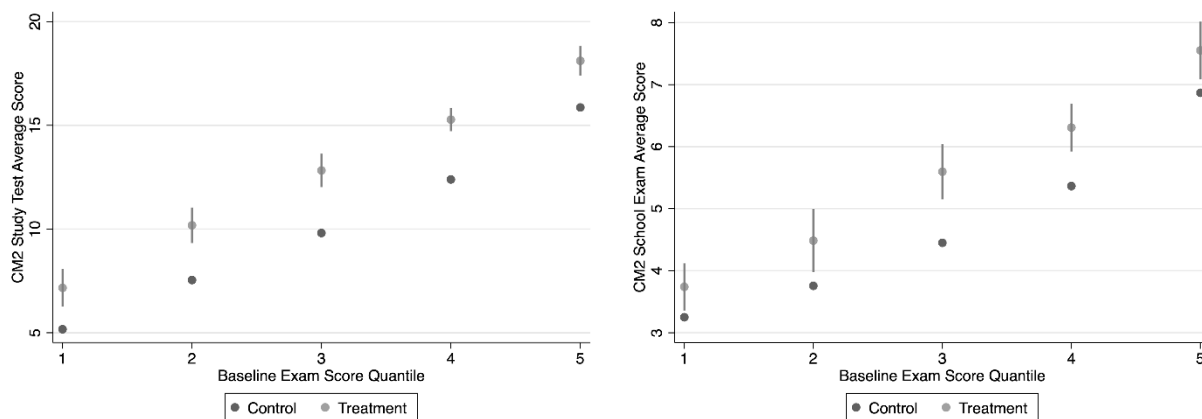
All baseline quantiles have a positive and statistically significant treatment effect; it is relatively larger for the third quantile on both exams. These findings suggest that all girls see test score benefits from Hilin Mu.

Challenges & Limitations:

Challenges faced during the evaluation included difficulty in reaching girls who had dropped out of school in order to test them, as well as the unreliability of certain data obtained from schools and school districts that we would have liked to have used in our matching process and analysis. The literacy and math pre/post tests were administered in schools to girls who were present. This means that girls who dropped out either by the end of grade 5 or beginning or end of grade 6 were not captured. Because this was more common in control schools, the sample size of girls for whom data was available was smaller, which may have led to underestimating the impact of the Hilin Mu program on participants because girls who dropped out may have been more likely to test poorly.

Regarding the reliability of data, we would have liked to have been able to compare school attendance data between intervention and comparison schools. However, attendance is not regularly taken by teachers during the school day, so we are exploring how to gather this data ourselves in the future. Additionally, securing reliable school data for the matching process proved difficult. We would have liked to be able to rely more heavily on school exams and drop out data from the previous school years to match eligible schools for the randomization process. In many cases, the data we received from schools did not match what the program team saw to be true in the schools, and so additional factors were added into the matching process to increase the likelihood of making effective pairings.

Due to the challenge of matching, there were three school pairs where either the intervention or control school was replaced following the randomization. These were excluded from this analysis, reducing our sample of available data to analyze and increasing the margin of error.

Conclusion:

On the whole, the data suggests that Hilin Mu leads to increases in exam scores – whether measured by the program team or the schools – and decreases dropout meaningfully for both girls who remain in grade 5, and for girls who progress to grade 6. Point estimates suggest that Hilin Mu increases exam scores by twenty to thirty percent in both subject-specific and general tests. In primary school, all girls seem to be roughly equally benefited by the program; in secondary school, evidence suggests that the program does more to help higher scoring girls, but that all girls continue to benefit. Hilin Mu also meaningfully increases girls' likelihood of staying in school, by close to 10% after one year, and more like 30% after two.

Appendices

Statistical significance is indicated by an asterisk in the following tables, with more than one asterisk indicating greater statistical significance. As previously mentioned, in the Nigerien school system, CM2 is the final grade in primary school and equivalent to the U.S.' grade 5. 6eme is the first grade in secondary school and equivalent to the U.S.' grade 6.

Table A1. Baseline Balance, Disaggregated by Cohort

Panel A. 2019 Cohort

	Took Baseline	Math Score	French Score
Intervention	0.124***	0.307	0.003
	(0.032)	(0.496)	(0.615)
Observations	852	778	780
Control Mean	0.91	8.90	9.09
Pair FE	Yes	Yes	Yes
Cohort	2019	2019	2019

Panel B. 2020 Cohort

	Took Baseline	Math Score	French Score	Repeated CM2
Intervention	-0.024*	-0.922**	-0.777	-0.037**
	(0.012)	(0.416)	(0.605)	(0.017)
Observations	792	779	779	792
Control Mean	0.91	8.90	9.09	0.11
Pair FE	Yes	Yes	Yes	Yes
Cohort	2020	2020	2020	2020

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A2. Pooled Grade 5 (CM2) Midline Results

	Math Score	French Score	School Exam	Pass to 6e
Intervention	2.658***	2.361***	0.753***	0.127***
	(0.272)	(0.303)	(0.136)	(0.029)
Observations	1433	1432	1544	1557
Control Mean	10.11	10.44	4.67	0.47
Pair FE	Yes	Yes	Yes	Yes
Baseline Covariates	Yes	Yes	Yes	Yes
Cohort	Pooled	Pooled	Pooled	Pooled

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3. Disaggregated Grade 5 (CM2) Midline Results

Panel A. 2019 Cohort

	Math Score	French Score	School Exam	Pass to 6e
Intervention	1.704***	1.838***	0.562**	0.135**
	(0.259)	(0.245)	(0.246)	(0.055)
Observations	661	660	806	852
Control Mean	10.11	10.44	4.67	0.47
Pair FE	Yes	Yes	Yes	Yes
Baseline Covariates	Yes	Yes	No	No
Cohort	2019	2019	2019	2019

Panel B. 2020 Cohort

	Math Score	French Score	School Exam	Pass to 6e
Intervention	3.477***	2.815***	0.971***	0.123***
	(0.453)	(0.550)	(0.152)	(0.037)
Observations	772	772	779	779
Control Mean	10.11	10.44	4.67	0.47
Pair FE	Yes	Yes	Yes	Yes
Baseline Covariates	Yes	Yes	Yes	Yes
Cohort	2020	2020	2020	2020

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A4. Grade 6 (6e) Endline Results

	Beginning of 6e		End of 6e		
	Math Score	French Score	Math Score	French Score	School Exam
Intervention	-0.323	-0.075	2.299***	3.275***	1.547**
	(0.526)	(0.402)	(0.467)	(0.362)	(0.617)
Observations	435	436	438	439	459
Control Mean	9.43	7.89	7.90	7.12	7.50
Pair FE	Yes	Yes	Yes	Yes	Yes
Baseline Exam Scores	Yes	Yes	Yes	Yes	Yes
Cohort	2019	2019	2019	2019	2019

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A5. School Enrollment Status

	Status After CM2			Status after 6e
	In School	In School	In School	In School
Intervention	0.075***	0.069***	0.195**	0.219***
	(0.022)	(0.023)	(0.075)	(0.073)
Observations	1644	1570	74	520
Control Mean	0.91	0.92	0.83	0.74
Pair FE	Yes	Yes	Yes	Yes
Cohort	Pooled	Non-Repeaters	Repeaters	2019

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$