Argentina

Lessons Learned from a Remote Tutoring Pilot

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ACCELERATE LEARNING ▶▶

IDB

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Lessons Learned from a Remote Tutoring Pilot

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Introduction

In 2020, the COVID-19 pandemic paralyzed school systems worldwide. In an effort to fight virus transmission, mandatory school closures caused a sudden stop in education access, interrupting classroom attendance to more than 1,600 million students in over 190 countries (UNESCO 2020). In Argentina, results from standardized tests scores (Pruebas Aprender published in 2021) suggest a decline in students ability in reading comprehension as compared to previous waves in 2018 and 2016.

Face to face classes were universally suspended in Argentina amid COVID-19. Sub-national governments arranged different policy initiatives to contain the education system community by enlarging digital infrastructure platforms for students, fostering teacher training to continue courses delivery remotely, widening the network of school support programs and extending active communication channels with the families.

Despite all efforts to mitigate learning loss and students dissociation from schools, 2020 revealed important gaps in students´ access to IT devices for education. Yet, high mobile penetration use in the country represents an opportunity for developing cost effective interventions using cellular phones. Such context offers a valuable landscape to test a tutoring session pilot intervention whose only strict technological requirement is that the family has access to a mobile phone. Different initiatives based on tutoring devices emerged to address learning lags exacerbated by the pandemic (Carlana & La Ferrara 2021, Angrist et. al 2022, Gortazar et. al 2022). In general terms, they all shared two common denominators: i) tutoring content adaptation targeted to students special needs and, ii) utilization of mobile technology as a high access, low budget priority within educational program designs.

Favorable learning results from mobile tutoring pilots overseas have drawn positive attention within education policy-makers to re-design and adapt tutoring sessions to countries specific conditions in Latin America and the Caribbean (LAC). In 2021, the Inter-American Development Bank promoted the design of remote tutoring pilot experiences to encourage a recovery in mathematics learning. A first wave of interventions was rolled out in Mexico, El Salvador, Guatemala and Argentina. In the case of Argentina, CEPE Di Tella worked together with the IDB on the implementation and evaluation of the pilot studies in the City of Buenos Aires and in the Province of Mendoza.

Accelerated Learning through Remote Tutoring in Argentina

Based on lessons learned from experiences abroad remote tutoring interventions n Argentina prioritized three aspects: 1) ensuring that students master foundational aspects of mathematics that are necessary for their educational continuity; 2) reaching families with a simple but effective intervention that allows the use of technology that already exists in homes, such as mobile phones; and 3) guaranteeing personalized learning for students aged 10 to 13, working according to each child's specific needs.
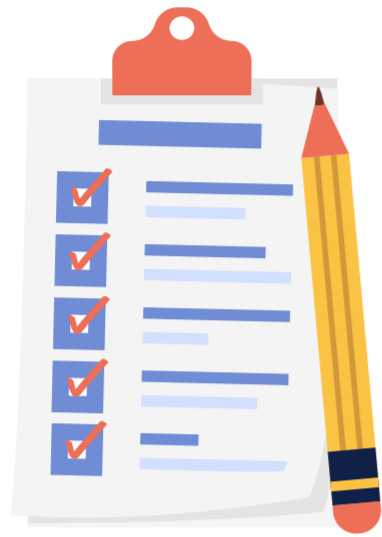
The project's preparation aimed to adapt and design remote tutoring for accelerated learning to the Argentine context and the specificities of the City of Buenos Aires and the province of Mendoza. In essence, the goal was to keep tutoring as a pedagogical intervention in mathematics content that is brief and cost-effective, functioning through remote telephone interaction, with a pilot implementation integrated into the educational system that operates within the current school calendar.

In order to adjust the support to the child's learning requirements and needs, an initial diagnostic test was designed. This diagnostic test consisted of a nine-question instrument that was applied during the initial contact with the family. The results of this survey allowed for differentiation of three groups based on the number of correct answers achieved. Based on these results, different circuits or paths were proposed for students. All paths included all the topics to be worked on, but differed in the week in which the work proposal began.

During the intervention, 10-13 years old students enrolled in public schools engaged with tutors during an 8-weeks-program covering addition, subtraction, multiplication, division analysis and problem solving. Every Monday a WhatsApp message was sent to the caregivers phone as an outbound message containing a specific assignment to solve a mathematics problem, requiring no need for a response. Figure 1 shows the flow of activities for each week, within the 8-week period intervention.

Figure 1: Tutoring session weekly protocol

INITIAL EVALUATION

8-WEEK PROGRAM

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY

A text message per week

A 20-minute call

1 CALL PER WEEK

To assign students to adequate treatment intervention level
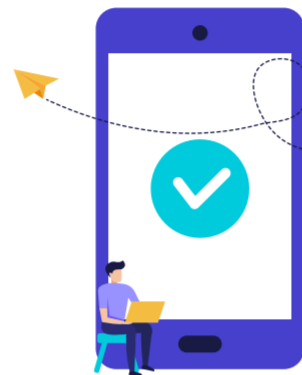
With a mathematical problem

The text message is sent each monday

Personalized tutoring in mathematics

Accompaniment by phone (20 minutes)

Early messaging allows students and their caregivers to practice the math problems before receiving a tutoring call.

Assignments were developed and adapted by curricular experts in Argentina. Between Tuesdays and Fridays each week, tutors connect with families through a 20- minute phone call where she checked-in with the caregiver and delivered tutor sessions content for the week. Tutors were trained to use engaging communication strategies and pedagogical approaches to deliver teach-at-the-right-level guidance to students.

Students recruitment: Demand creation for remote tutoring

Originally, we started recruiting families in the City of Buenos Aires based on a list provided by the City Ministry of Education. It contained basic information on the student and her parents, albeit most importantly we required a valid phone number that we could use to contact participants. Eligible participants were aged between 10 and 13 years old. Out of 28,308 original registers, we identified a potential sample of 5,122 families and discarded the remaining ones because they were either out of the age range, or had invalid phone numbers. We called these numbers, explaining the aim of the phone call and introducing the program to the families. After 3 weeks into the family recruitment phase we were only able to enroll 503 families and had a baseline survey completion conversion rate of 13% (this is, out of 3,958 contacted families only 503 families gave their consent to participate in the study). In order to meet sample size goals, we then followed a parallel strategy of enabling a self-enrolling system for families to complete a form with their contact information and expressed consent to receive a phone call for a brief conversation on how the pilot worked. As many school principals provided information about the program, pre-enrollment figures increased every week. After 5 weeks, we had a total of 769 families self-enrolled and the acceptance rate of these phone calls was considerably higher with 526 pre-enrolled families completing the baseline survey, representing 43.7% of the final 1,204 student sample.

Given the experience in the City of Buenos Aires, recruitment in Mendoza exclusively used pre-enrollment data. Hence, no families were individually contacted by program staff to sign up in the pilot program. This implied a much more efficient way of enrolling families, with 8 in every 10 families willing and able to participate. However, we were unable to meet the sample size required to allow for a control group. From a total of 406 pre-enrolled families, 293 families effectively participated in the tutoring program in Mendoza. One of the reasons that might have affected participation is that the province had many simultaneous programs reaching schools, which may have caused families and management teams from schools not to prioritize this tutoring program in particular.

Teacher´s College Students as Program Tutors: a supply side innovation

One of the greatest challenges was found in defining the profile of the tutors and the mechanisms for their recruitment. On one hand, it was necessary to determine who could fulfill the responsibility of accompanying participating families and establishing a tutorial relationship. On the other hand, it was necessary to consider what incentives to implement in order to recruit tutors and encourage their participation in the program. Different options were considered based on the experiences in other countries, including recruiting university students, practicing teachers, and/or students in teacher training programs. Both of these profiles lacked exposure to formal education training as teachers and/or some degree of knowledge on mathematics teaching practice at primary education level.

Finally, we found a way to cover these requirements by agreeing to work with public teacher college institutions under the administrative umbrella of the City of Buenos Aires Ministry of Education. Teacher college students venturing to graduate as primary teachers and mathematics teachers enrolled in years 3 and 4 served as tutors for the program. Essentially they have completed relevant coursework in education and they certainly carry a vocational call to work as teachers.

The following profile was defined for the tutors: 1) Currently enrolled in a higher education program in teaching (tertiary or university level); 2) Dynamic, proactive, and willing to solve problems with active listening skills; 3) Experience in the educational system and/or in non-formal educational activities (not exclusive); 4) Responsibility, commitment, and a positive attitude toward the task; 5) Commitment to confidentiality in handling information.

The tutoring pilot provided them with an opportunity to go through a paid professional experience as part of their educational trajectory. In order to recruit tutors, promotional activities were carried out through teacher training institutes, distributing flyers with information about the project. All interested individuals were invited to attend an informational meeting, where the key features of the program were presented. We received over 100 applications coming from 20 different teacher colleges; ending up with 69 tutors that were selected based on their profile and possibilities to meet the desired days and working hours.

In Mendoza, we scheduled meetings with the directors of teacher training institutes. The project was presented in these institutes and the directors were asked to actively promote it. Additionally, an agreement was reached whereby teacher training students who performed the tutoring sessions would receive recognition for them as a percentage of their professional practice or as a final-year course. Consequently, the initial registration of tutors in Mendoza was 487 tutors. After a selection process, we finally admitted 74 tutors to join the program. Due to a shortage of tutors in CABA, 21 of the tutors from Mendoza were transferred to work with students in that jurisdiction. Before starting the tutoring sessions, 5 tutors were dismissed due to low participation, so 48 tutors started and remained constant until the last week of tutoring.

Tutoring standards: ensuring all students received the same intervention

One of the primary challenges in implementing tutoring pilots is ensuring that all students receive consistent, high-quality tutoring and attention, regardless of their assigned tutor. To address this challenge, the program considered a range of actions aimed at improving the quality and consistency of tutoring services.

First, the program had established a role of Tutors Coordinator to oversee the overall implementation of tutoring services and ensure consistency across tutors. The Coordinator provides guidance and support to tutors, helps to develop standardized tutoring practices, and monitors the quality of tutoring services. Second, the program has developed a virtual campus and Massive Open Online Courses (MOOCs) to provide training and support for tutors. These resources covered not only curricular material but also key topics such as effective communication, building rapport with students, and identifying and addressing student needs. Third, the program established weekly discussion forums for tutors to share experiences and best practices, promoting collaboration and consistent approaches to tutoring. The Moodle classroom based a Universidad Torcuato Di Tella´s virtual campus was first used for training purposes and later for tutoring as a workspace. The virtual classroom was designed with a focus on creating a collaborative and easily accessible environment that efficiently supports the tutoring learning process.

The platform was designed to facilitate tutor participation and encourage abundant interaction. This was achieved by creating a user-friendly environment that promotes active tutor engagement through the use of various tools such as manuals, videos, forums, quizzes, and videoconferencing. The platform also allows for both synchronous and asynchronous communication, ensuring constant communication between tutors.

Additionally, the use of tools like Mural, Menti, Padlet, and Genialy facilitated data analysis and report generation, which were also integrated in the virtual campus.

In addition to training, accompanying, and guiding tutors, a key element to guarantee the quality of the service provided is monitoring the intervention. At the beginning of the project, we identified the needs for providing monitoring and tracking solutions to each of the actors involved: tutors would need instructions and family background (including child progress in the program) to engage in their sessions, tutor coordination would require daily and specific data on each tutor and family to observe the progression of the tutoring; the IDB team and the government would need accumulated and global data, and the general coordination team should identify specific problems with families, contact spaces (call center), and general operational problems.

Having understood this requirements, we designed a monitoring ecosystem that combined the following tools:

- Survey CTO: a data collection platform where tutors loaded data after every session and where they could access summarized data on the family they where to work with in the session.

- Moodle (Virtual campus): as mentioned, this was the platform where tutors and coordinators interacted on a daily basis, allowing instructions and consultations to flow between them.

- Power-Bi: an online dashboard constructed using data from Survey CTO that would allow for the visualization of alarms, pending cases and general progression of the program.

In Figure 2. below we schematically portray the flow of information and uses given to the tools that compose the monitoring ecosystem.

Figure 2: Monitoring ecosystem and tools used
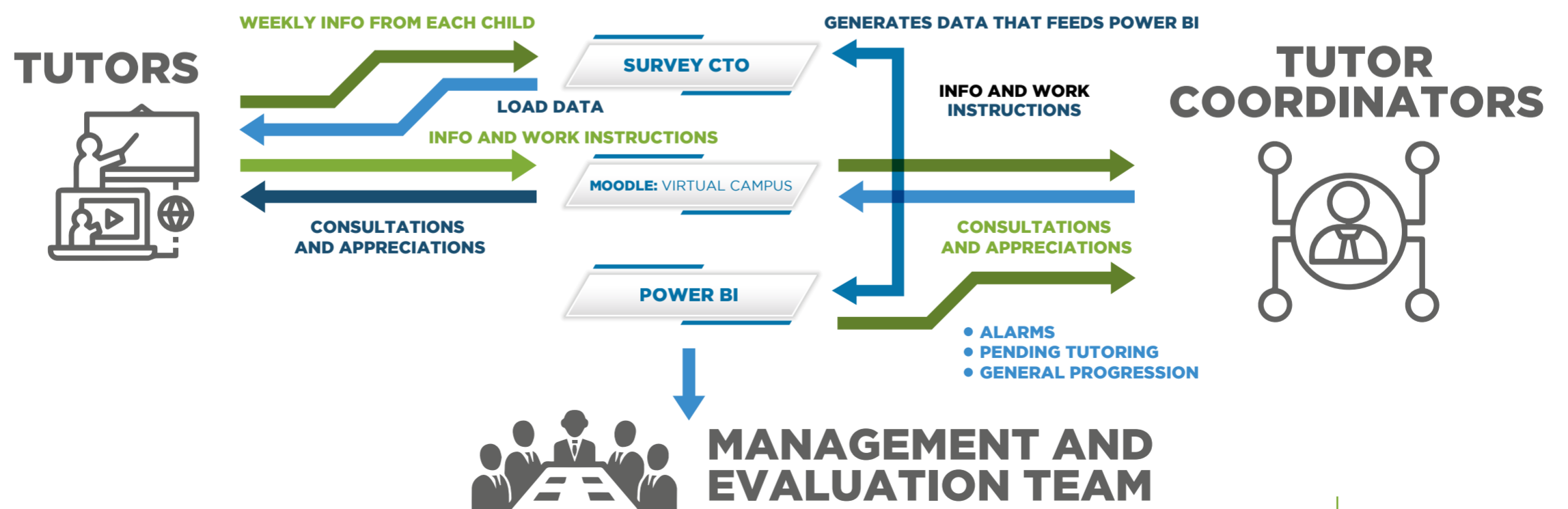
Main results

Academic performance

This section covers results from the intervention carried out in the City of Buenos Aires. Poor enrollment in Mendoza prevented us from constructing a valid control group that could be used for measuring results and government officials, in accordance with the IDB and CEPE, decided to carry out the intervention for all 293 enrolled students.

>> *RCT estimator*

We estimate null effects in academic performance in our intention to treat and treatment on the treated estimators from a randomized controlled trial among students in the City of Buenos Aires. Academic performance effects are measured as the difference in the fraction of correct answers given by students assigned to treatment vs. the control group in the standardized test. Robustness checks validate these results. We gather that the study's sample size is unable to capture a precise zero given that the confidence interval is quite big, ranging from a negative 0.10 standard deviations to a positive 0.14 standard deviation. This implies that we are unable to reject that the intervention had an impact as large as that seen in interventions of similar characteristics (duration and intensity of tutoring sessions). This points to one of our main recommendations of allowing for sample size to properly capture intervention like effects.

Table 1. Academic achievement.

	ITT	TOT	
		Received at least one session	**Number of sessions**
Treatment	0,014 (0.062)	0,015 (0.068)	0,012 (0.011)
Observations	832	832	832

Notes: "ITT" refers to Intention to Treat and is based on OLS regression, while "TOT" refers to Treatment on Treat and is based on 2SLS. In the column ("Received at least one session") the instrumented variable is a dummy variable that takes value one if the student took at least on session and zero otherwise, while in the second column ("Number of sessions") the instrumented variable is the number of sessions each student attended. Controls included but not shown: gender, grade, overage, finds math difficult, pandemic support, learning disorder and internet. Parents characteristics include schooling and employment status. T-statistics in parentheses based on robust standard errors and denote significance at the 1, 5 and 10 percent level. Fixed effects on the strata are considered.

>> *Differences in performance following tutoring program completion*

Towards the end of the implementation of the tutoring sessions, we noticed a significant heterogeneity in treatment intensity. In other words, we observed wide variation in the amount of tutoring sessions received in the treatment group. To analyze this phenomenon, we divided the treatment sample into three subgroups based on the amount of tutoring they received: group 1, those assigned to the treatment group who did not receive any tutoring, group 2, those who received between 1 and 6 tutoring sessions, and group 3, those who completed the tutoring, with 7 or 8 sessions.

There is a significant negative association between those who do not receive tutoring in the treatment group (0 tutoring sessions) and their performance in the follow-up stage when compared to the control group, even after controlling for observable characteristics that could bias the causal interpretation of the estimator. We find no association between those who received between 1 and 6 tutoring sessions when compared to the control group. Finally, we document a positive and statistically significant association for the subgroup that completes the program (7 or 8 tutoring sessions) in academic performance. These comparisons should be taken with caution since, even though observable characteristics are controlled for, there is a non-negligible probability of not capturing with the linear specification and with the variables included in the model, possible selection biases.

Table 2. Academic achievement by number of tutorials performed.

	0 tutorials	1 to 6 tutorials	7 or 8 tutorials
Treatment	-0.294** (0.154)	-0.119 (0.0871)	0.136** (0.0738)
Baseline Performance	0.370*** (0.0480)	0.385*** (0.0430)	0.398*** (0.0399)
Student Characteristics Male	0.0388 (0.0876)	-0.0216 (0.0798)	-0.0178 (0.0742)
Grade 5	0.169* (0.115)	0.167* (0.102)	0.216*** (0.0925)
6th grade or higher	0.380*** (0.115)	0.373*** (0.104)	0.331*** (0.0918)

Mathemaics difficult subject	-0.175** (0.0911)	-0.188*** (0.0820)	-0.135** (0.0766)
Received support in pandemic	-0.251*** (0.107)	-0.307*** (0.0893)	-0.211*** (0.0875)
Have a learning disorder	-0.154** (0.0919)	-0.0734 (0.0802)	-0.0918 (0.0762)
Over age	-0.0300 (0.175)	-0.175 (0.152)	0.000754 (0.146)
Caregiver characteristics High school education	0.0134 (0.116)	0.0105 (0.110)	0.149* (0.0988)
Higher education	0.164 (0.122)	0.200** (0.119)	0.270*** (0.103)
Part-time employment	0.0268 (0.104)	0.0748 (0.0950)	-0.0188 (0.0866)
Unemployed	-0.0599 (0.117)	-0.00342 (0.102)	-0.0376 (0.0921)
Household and sample characteristics Household with internet	0.169 (0.164)	-0.0147 (0.144)	0.0834 (0.140)
Administrative data	-0.268*** (0.0939)	-0.267*** (0.0862)	-0.255*** (0.0776)
Constant	0.126 (0.184)	0.111 (0.172)	-0.00464 (0.145)
Number of observations	397	523	597

Notes: Standard errors in parentheses. * $p < 0.15$ ** $p < 0.1$ ***$p < 0.05$.

>> *Propensity Score Matching estimator*

We conducted a propensity score matching approach to construct comparable groups between those that had completed the tutoring program (treatment subgroup with 7 or 8 completed sessions) and the control group. This analysis had a dual objective. First, by studying the propensity score of completing 7-8 sessions, we can provide highly relevant information that allows us to infer which observable characteristics of participating families are associated with an expected outcome in the number of sessions actually taken. In this sense, the propensity score can help define which characteristics best predict who will complete the program. The second objective is associated with the possibility of mitigating potential biases in the causal interpretation of the impact of tutoring on student learning by comparing academic performance between matched students from the treatment and control group.

Our matching estimator identifies an average impact of tutoring for the treated group of 0.15 standard deviations in academic performance, which is statistically significant at 15% confidence interval. The results of this matching process are presented in Table 3 below.

Table 3. Average treatment effect estimator for the treated group based on nearest neighbor matching using the propensity score index.

Estimation of average treatment effect for the treated. Treated (7 or 8 tutorials) vs. Control	
Treatment	0.150* (0.0955)
Number of observations	537

Notes: Standard errors in parentheses. * $p<0.15$ ** $p<0.1$ ***$p<0.05$.

>> Drivers of tutoring sessions participation

As has been mentioned, the propensity score matching approach can help identify the characteristics associated with a higher probability of completing the program. Our results show that those students who received support during the pandemic and children who reported feeling confident about going to college at baseline were less likely to complete tutoring sessions. This result can be an indication that the program achieves greater adherence among the most disadvantaged families since it is the children with the least aspirations and those who had the least support during the pandemic who are most likely to complete the program. It is also relevant that families who entered the program through a pre-enrollment system (and not on the basis of administrative data) have higher chances of completing the program. Although these results are informative, it is important to keep in mind that the model is likely to be biased by omitted variables since it is feasible to assume that there are unobservable or unmeasured characteristics in our surveys that may account for a family's chances of completing the program. On the other hand, it is possible that the probability of completing the program is not so much related to demand (the characteristics of students and caregivers), but rather to supply-side features of the program, i.e. the ability of tutors to generate spaces with students that are conducive to work. In order to address this concern, we studied the role of tutors and caregivers in predicting completion.

Table 4. Index of propensity to complete the tutoring program (7 or 8 complete sessions vs. the rest of the treatment group)

"Probit regression: probability of completing tutoring sessions. Treatment subgroup: 7 or 8 tutoring sessions completed "	
Caregiver with secondary education	-0.0839 (0.235)
Caregiver with higher education	0.170 (0.247)
Received pandemic support	-0.438** (0.230)
Child's confidence in going to college	-0.435*** (0.194)
Student is male	0.187* (0.129)

Notes: Standard errors in parentheses. * p<0.15 ** p<0.1 ***p<0.05. Second order terms included but not shown: employment*Child's confidence in going to college and employment*support in pandemic.

Administrative data	-0.224** (0.132)
Caregiver employed part-time	-0.180 (0.240)
Caregiver unemployed	-0.315 (0.294)
Constant	0.400 (0.297)
Number of observations	**414**

>> *Tutors commitment predicts higher students participation in tutoring sessions*

We also analyzed he relationship between the number of sessions completed by students and the level of commitment of caregivers and tutors serving such students. In order to measure the level of caregiver engagement, we considered the percentage of times caregivers accompanied the children during the tutorials. As for measuring tutor engagement, we built an index of tutor commitment using data from their level of participation during the training period, their predisposition to interact with peers and program coordinators in available discussion forums throughout the program and students perception data considering tutors performance. Our results showed that while the level of commitment of caregivers does not seem to be associated with a higher number of completed tutorials, the commitment of tutors turns out to be a highly significant predictor of completed sessions by students. On average, tutors with the lowest commitment index completed 5 tutorials, while those with medium commitment added 0.77 tutorials to this average and those with high commitment 1.37 tutorials.

Table 5. Mechanisms associated with an increase in the number of tutoring sessions completed

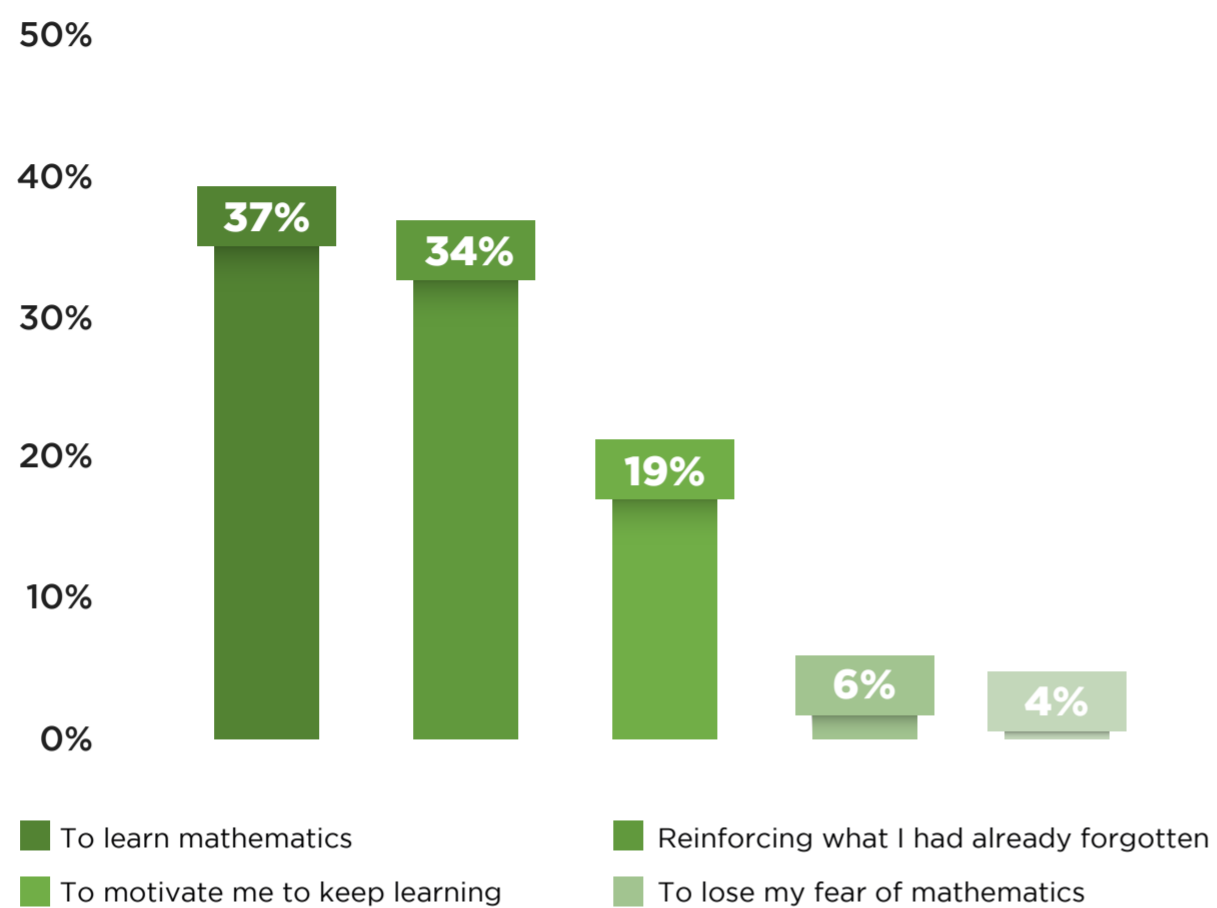|	Caregivers	Tutors
Medium level of commitment	0.309 (0.234)	0.770*** (0.226)
High level of commitment	-0.194 (0.264)	1.365*** (0.217)
Constant	5.494*** (0.593)	5.084*** (0.551)
Number of observations	**425**	**425**

Notes: Standard errors in parentheses. * p<0.15 ** p<0.1 ***p<0.05. Controls included but not shown: student characteristics (gender, grade, mathematics difficult subject, pandemic support, learning disorder, over-age), primary caregiver characteristics (education and employment status), internet at home, administrative data.

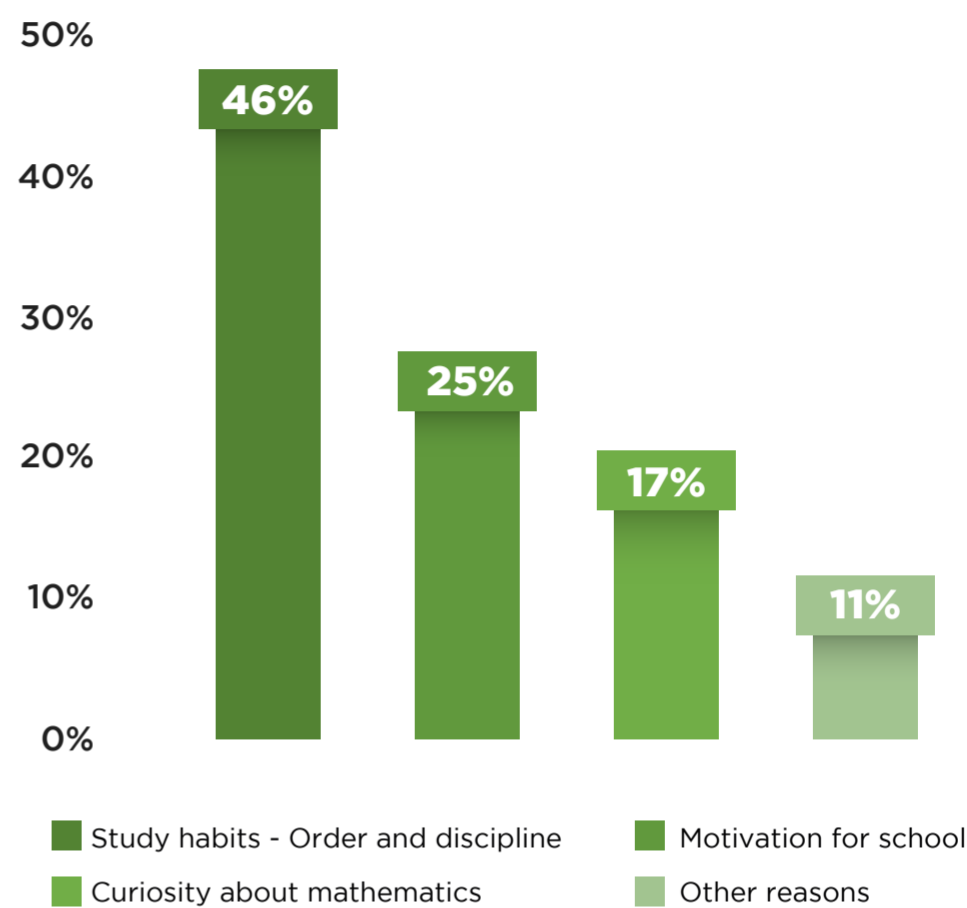## >> *Tutoring sessions experience valuation*

Furthermore, at the end-line we included a series of questions for caregivers and for students that allowed them to value the experience of participating in the tutoring program. Learning mathematics in general and the possibility to revise and go through previously learned content were among the most valued aspects of the tutoring sessions. This result shows that the contents addressed during the project were already known by the students, which resulted in a reinforcement of "forgotten" topics. On the other hand, having caregivers as respondents to the survey, we aimed to gather their beliefs on whether the program contributed to a learning process by program participants beyond those strictly related to the field of mathematics. In the answers, it is relevant that almost half of the caregivers highlighted the executive functions associated with the study habit and the order and discipline to do homework as the most relevant contribution.

Figure 3. What did tutoring contribute to the learning process, according to students and caregivers?

To students: What do you feel the tutoring helped you with?

50%
40%
30%
20%
10%
0%

37%
34%
19%
6%
4%

- ■ To learn mathematics
- ■ To motivate me to keep learning
- ■ Reinforcing what I had already forgotten
- ■ To lose my fear of mathematics

To caregivers: What other learning or skills did the child develop by participating in the tutoring program?

50%
40%
30%
20%
10%
0%

46%
25%
17%
11%

- ■ Study habits - Order and discipline
- ■ Curiosity about mathematics
- ■ Motivation for school
- ■ Other reasons

>> *Satisfaction with the program*

Finally, we inquired about the general satisfaction of caregivers and students with tutoring. The caregivers were asked whether they believed tutoring sessions had improved their children's learning and their overall satisfaction with the quality of the tutoring services received. Ninety-four percent of the caregivers believed that the tutoring improved the students' learning and 95% were satisfied with the quality of the service received (22% were satisfied and 73% were very satisfied). For their part, the participating children were asked if they liked the tutoring and if they would recommend it to a friend: 96% liked it and 94% would recommend it.

Recommendations for scaling up in Argentina and the region

Based on the pilot analysis of the implementation of the tutoring sessions in Argentina, we suggest a list of effective recommendations for the design and implementation of similar tutoring programs elsewhere in the region.

1st recommendation:
Prioritize recruitment mechanisms for eligible families based on pre-registration systems rather than relying on an administrative contact record process.

It is important to prioritize mechanisms for recruiting eligible families based on pre-enrollment systems as opposed to a contact process based on an administrative basis of contact records. The analysis of our propensity score to complete 7 or 8 tutorials indicates that pre-enrolled families that opted into the program were more likely to complete all tutoring sessions. In addition, the family pre-enrollment format achieved better recruitment results in terms of time and effort required for pilot implementation.

2nd recommendation:
Ensure active participation from School System Authorities.

Students recruitment activities should rely on coordinated actions and active participation from the Ministry of Education. Ideally, tutoring initiatives should have a web page with complete information and a Frequently Asked Questions section for parents and students.

3rd recommendation:
Develop a strong monitoring strategy.

High investment in program monitoring and support materials for tutors pays off. Online resources for tutors available in a virtual environment enhanced tutors engagement and participation. Connection to peers and closeness to program coordinators was facilitated by these online resources. The development of a visual dashboard generated in Power BI proved to be an effective tool to generate administrative data that has been used to improve and adjust program delivery strategies during implementation.

4th recommendation:
Keep tutors engaged.

In order to achieve success in any program, it is crucial to establish formats that ensure all tutors remain active, motivated, and highly engaged. Tutors play a critical role in the success of the program, as they provide support, guidance, and instruction to learners throughout the process. Without the dedication and commitment of tutors, it can be challenging to maintain the momentum needed to complete the program. When tutors are disengaged or unenthusiastic, learners may begin to lose interest or feel demotivated themselves. Therefore, it is essential to develop formats that encourage and support tutors in staying engaged and motivated. This can include providing regular feedback and recognition, creating opportunities for ongoing learning and professional development, and fostering a sense of community among tutors. By investing in the well-being and motivation of tutors, programs can increase the likelihood of successful completion, benefiting both tutors and learners alike.

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Argentina

Lessons Learned from a Remote Tutoring Pilot

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ACCELERATE LEARNING ▶▶

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