

Italy

Tutoring Online Program (TOP): A Successful Global Experience

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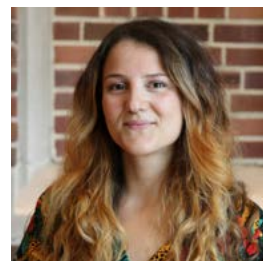
Tutoring Online Program (TOP): A successful global experience



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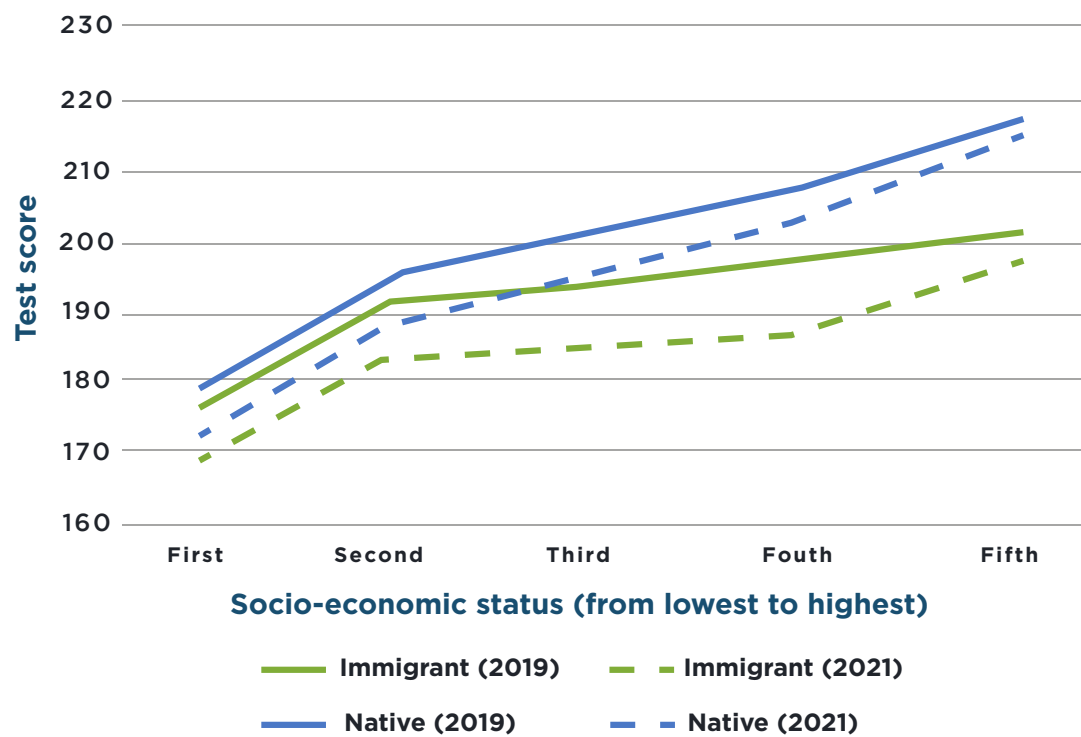
Illustration and graphic design: **Juan Sebastián Fonseca**

Introduction and problem

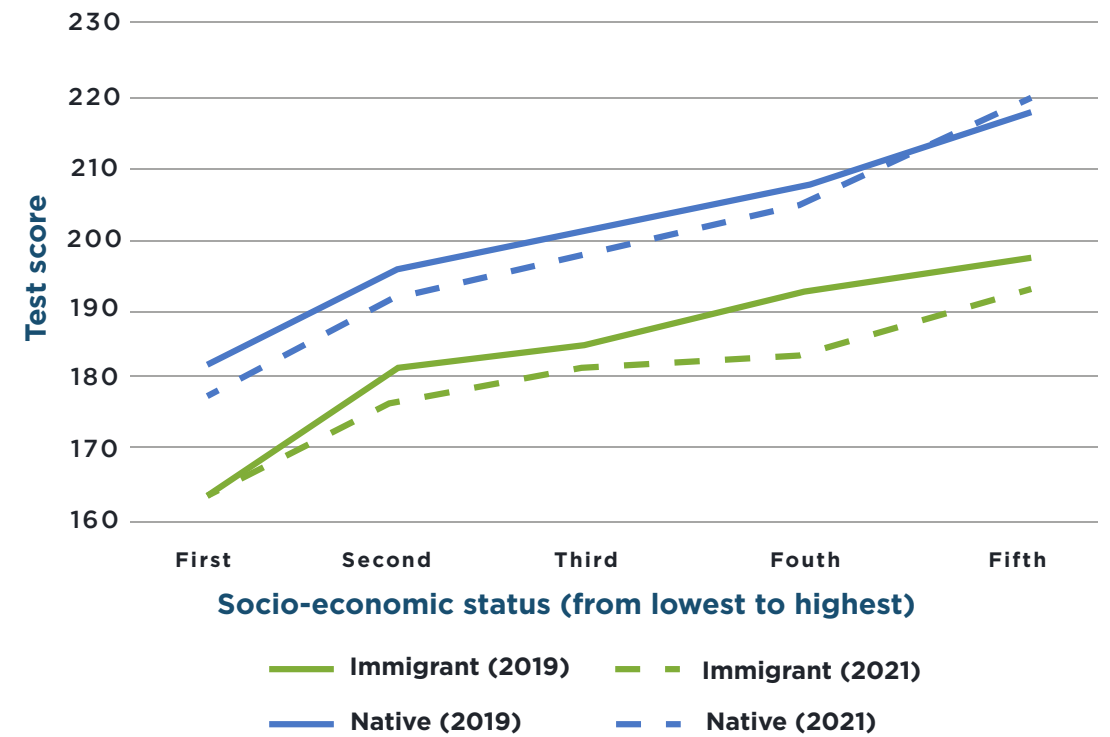
The COVID-19 pandemic has had a profound impact on education across the world. One of the most significant challenges that schools have faced is the need to close physical classrooms to prevent the spread of the virus. While this measure was necessary to protect public health, it also created a significant learning loss for students. A joint UNESCO, UNICEF and World Bank report estimated that these losses amount to \$17 trillion in lifetime earnings in present value (World Bank et al., 2021). School closures also had severe impacts on the psychological and socio-emotional well-being of students (Golberstein et al., 2020). This is a cause of concern, considering that schools are often the main places where students socialize and have the opportunity to develop their socio-emotional skills outside of family interaction. What is more alarming is that the above factors impacted disadvantaged students more severely than their advantaged peers.

Disadvantaged students suffer more from the absence of formal education because they are more detached from the educational system, and their parents might not have the resources to compensate for the lack of formal schooling with other alternatives such as tutoring, either in terms of finances or time investment. The biggest risk is student dropout at a very early stage, which is going to have long-lasting and severe consequences throughout the student's life. During 2020, Italian schools remained closed from the onset of the pandemic in March until summer, encompassing a period exceeding one-third of the total academic year. In the case of Italy, there was a high heterogeneity of school quality and remote instruction by socio-economic status, as well as of other inputs to accelerate learning after schools reopened, such as good quality tutors. Carlana, La Ferrara, and Lopez (2023) provide evidence that inequalities in learning by socio-economic status have been exacerbated by school closure: Graph 1a show the gap in average test scores in math post-covid is larger among the bottom quintiles, both for native and immigrant students, although more pronounced for the latter group. A similar pattern is present also in reading (Graph 1b), where the negligible difference in test scores pre vs post covid for the bottom quintile of immigrant students can be explained by the presence of a "floor effect" (i.e. immigrants' attainments in reading were significantly low also pre-covid). These widening gaps are likely to have a negative impact also in the medium and long run, as they might affect students' high school track selection and future academic achievements (Carlana et al., 2022).

Graph1a: Test score in Grade 8 (Math)



Graph 1b: Test score in Grade 8 (Reading)



Source: Own elaboration based on Tutoring Online Program (TOP) data.

Tutoring programs have been promoted across the world to accelerate student learning and compensate for interrupted instruction due to COVID-19. However, these programs are costly and depend on the supply of good quality tutors nearby, which significantly impairs scalability. The features mentioned above make a substantial case for the use of remote tutoring to close the learning gaps between advantaged and disadvantaged students and keep them inside the scholastic system. The pandemic is a particularly important setting to test remote learning, but other features, such as scalability and a limited supply of high-quality tutors in a particular location, make remote learning important and relevant also in the post-pandemic world.

A woman with long dark hair, wearing a light-colored button-down shirt, stands in a classroom. She is pointing her right hand towards a whiteboard. The whiteboard has several mathematical formulas written on it, including $\cos \beta = \frac{a^2 + b^2 - c^2}{2ab}$ and $\sin \frac{\beta - \alpha}{2}$. The background is slightly blurred, showing a desk with a laptop and some papers.

Solution and characteristics

TOP -- Tutoring Online Program -- is an after-school tutoring program originally designed by Michela Carlana and Eliana La Ferrara, in collaboration with a pedagogical team from Bicocca University in Milan, in order to provide academic support to middle school students who faced learning challenges during the pandemic. The program was then scaled up and implemented regularly every year since then¹. By offering online one-on-one support from a trained tutor, the program aims to help students improve their academic performance and achieve their full potential. The program is implemented in partnership with schools that are directly involved in the identification of the children who need the support of the tutor the most.

The program is structured around three core subjects: Italian, Mathematics, and English. These subjects have been selected because they are critical areas of study that students must master to succeed in proceeding with further education. The program is designed to be flexible and can be adapted to meet the unique needs of each student. For example, a student who is proficient in Italian, but struggles with math, may receive support in this subject area.

The evaluation is conducted using a comprehensive approach that is partially integrated into its implementation. For instance, the data collected during the recruitment process serves as a baseline for the evaluation. An endline evaluation is conducted at the end of the tutoring period to measure the program's impact on student performance, aspirations, socio-emotional skills, and well-being. Thanks to the partnership between the research team at LEAP-Bocconi, the Italian Ministry of Education and the National Evaluation Center, Carlana and La Ferrara can evaluate the long-term impact of the program on students' dropout, high-school track choice, and learning performance in the long-term. This data is then used to refine and improve the program for future iterations.

1. The fifth edition of the program will be implemented in 2023-24 in Italian schools.

The first edition of the program was conducted over a period of five weeks in April-June 2020 and it involved 1,059 participants. Half of the participants were assigned a tutor, while the other half served as the control group. The program's evaluation framework allowed for continuous improvement and refinement of the program in subsequent iterations testing different components and aspects that could further help accelerate learning and scalability, such as the impact of individual vs. group tutoring.

Since 2022, the implementation of the program, including the recruitment and management of tutors, is outsourced to Centro Italiano Aiuti all'Infanzia (CIAI), a local NGO with extensive experience in implementing projects aimed at addressing educational poverty. A comprehensive training program for tutors include, among others, modules on the child protection policy, effective teaching methods, student engagement strategies, and best practices for supporting students with learning disabilities. In addition to providing training, CIAI is also responsible for monitoring the performance of the tutors. This involves conducting regular check-ins to ensure that the tutors are meeting the needs of their students and providing high-quality support.

The TOP program has three distinct features:

1) Online tutoring: The tutoring lessons are conducted entirely online and are delivered through a well-known platform called WeSchool, where tutors and tutees meet, conduct their lessons, and share resources. Moreover, all the interactions with the school, the students, and the tutor happen through computer, tablet, or phone: from inviting schools to participate in the project to the training of the tutors. The program's fully online feature rendered it highly suitable to operate during the pandemic period in which it was first introduced, given the prolonged closure of schools and limitation in after-school social interactions. However, the program's features have been proven useful and effective also in the post-pandemic era. While the literature on in-person tutoring by teachers and paraprofessionals (Nickow et al., 2020) has shown promising results, budgetary and organizational constraints may hamper the potential for scaling up this model. There are several advantages associated with providing students with an online form of tutoring:

- A.** Cost-effectiveness: online tutoring minimizes costs of operational frictions and implementation costs (i.e., time involved to reach the tutoring venue, transport costs, payment of tutoring venue etc.).
- B.** Accessibility: online tutoring allows one to overcome geographical barriers and matches tutees with tutors who possess the necessary skills and expertise to provide effective tutoring, regardless of their physical location. When considering regional differences in socio-economic status and the ability to access high-quality tutors, online tutoring is extremely important because families living in disadvantaged areas may not be able to access high-quality tutors, even if they

wish to pay for this service. The online platform is easily accessible via personal computers, tablets, or smartphones, making tutoring accessible also to students who do not have access to traditional in-person tutoring services.

- C.** Flexibility: Online tutoring offers greater flexibility in terms of scheduling, as both tutor and tutee can participate from any location with an internet connection.
- D.** Customization of learning experience: online tutoring allows tutors to leverage the use of technologies (such as virtual whiteboards, mind maps, and other learning apps) to tailor teaching to the tutee's unique needs and learning style.
- E.** Safety: online tutoring requires the development of stringent child protection policies to mitigate risks such as possible inappropriate behavior online. However, in periods where social distancing is necessary, such as pandemics, online tutoring offers a safe alternative to risky face-to-face interactions.

These studies represent one of the largest multi-country evaluations in education conducted to date. Fewer than one percent of randomized studies in education have been conducted across multiple countries, notwithstanding notable examples such as Teaching at the Right Level (Banerjee et al. 2017). These multi-country replication efforts demonstrate how an approach can replicate across contexts and demonstrate the potential of rigorous evidence to inform policy and practice.

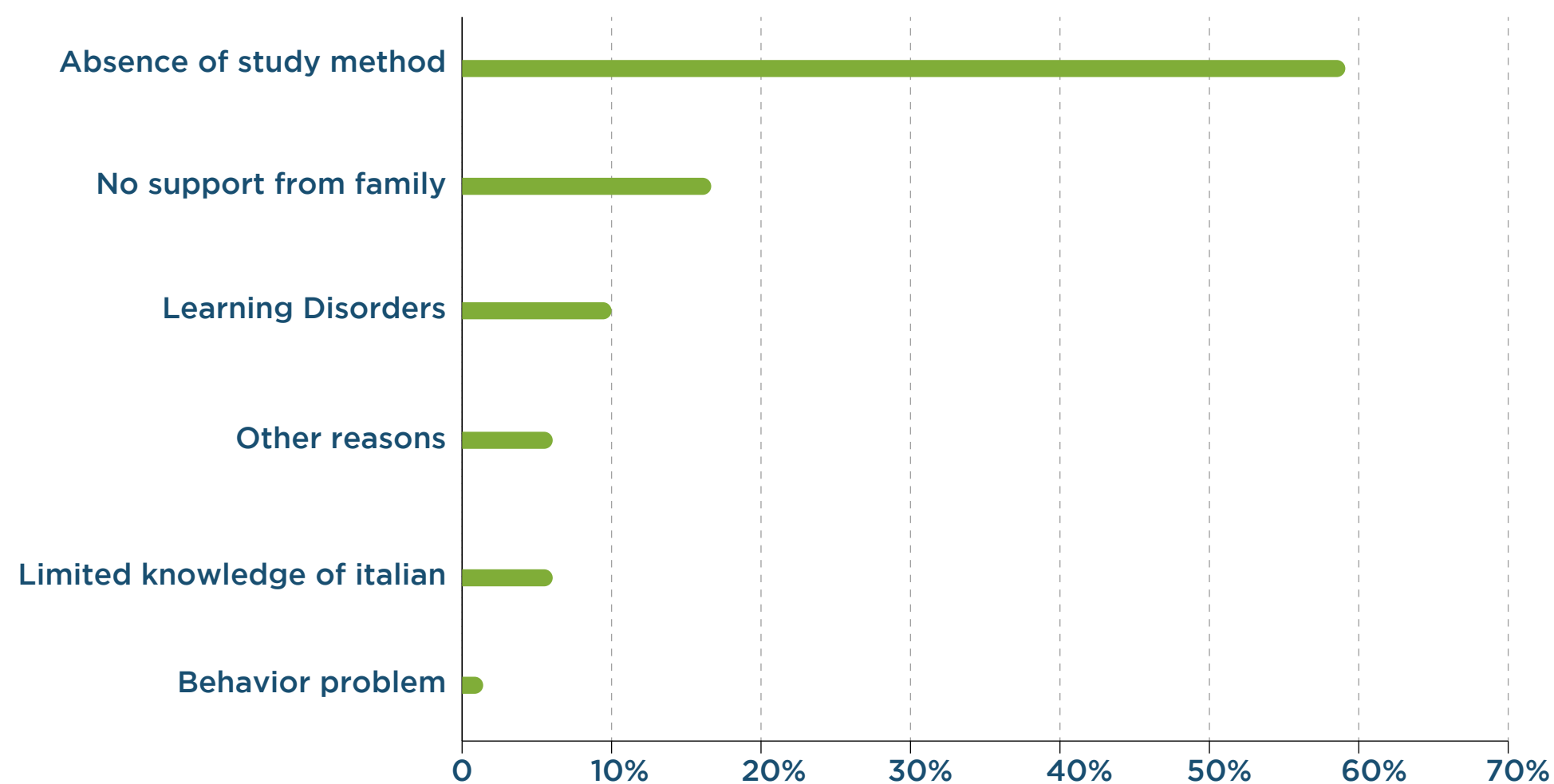
2) Volunteer university students as tutors: The tutors who take part in the Tutoring Online Program are not trained as educators: they are university students from all disciplines who volunteered to participate. As a result of that, they received training and support from the program's pedagogical experts. Teachers and other workers are undoubtedly prepared, however, the skills required in traditional classroom interactions are different from the ones necessary for tutoring (Cook et al., 2015) where the high quality of interactions between tutor and tutee is fundamental for success. The program harnesses the intrinsic and pro-social motivation of tutors to facilitate high-quality interactions with tutees, which is of particular significance for students who are often disengaged from the traditional school system and face a heightened risk of dropping out. As part of the online tutoring program, tutors are supported by pedagogical experts throughout the program, and before starting the tutoring, they undergo a rigorous training program (see more details in the Program Implementation section). This ensures that tutors are equipped with the necessary skills and knowledge to provide high-quality online tutoring services to students aged 11 to 13 and are able to interact with them. Additionally, the program provides ongoing support and professional development opportunities for tutors to continuously improve their teaching and social skills. Designating volunteer university students as tutors offers several benefits:

- A.** It is a **cost-effective solution**, as mobilizing resources to hire certified professionals may not allow for large-scale implementation, especially in disadvantaged areas.
- B.** It leverages tutors' **intrinsic motivation** to generate a more engaging and committed tutoring environment, possibly through higher-quality interpersonal interactions.
- C.** It provides **positive role models** for students who may not have regular access to higher education opportunities. University student tutors, being closer in age and sharing similar experiences with their younger tutees, can foster a stronger connection, leading to a more engaging and effective learning experience. Moreover, volunteer tutors bring diverse perspectives and experiences that can broaden students' understanding of the world around them and future educational and career opportunities.
- D.** It promotes a **sense of community engagement** and social responsibility among university students, who may develop a better understanding of the challenges faced by disadvantaged communities and contribute to their development.

3) Student targeting process: The TOP program operates in close collaboration with schools to identify students who are academically or financially disadvantaged and, therefore, most in need of tutoring services. The target population of this program is middle school students (from grade 6 to grade 8) who face various challenges in school due to socioeconomic status, linguistic barriers (e.g., students who are first-generation immigrants), or learning difficulties. This program is also inclusive of individuals who have been diagnosed with or are suspected to have learning disabilities. As a result, a specific component of the tutor training is devoted to addressing the unique needs of this group.

The selection process actively involves teachers to ensure that the students who receive tutoring services are those who most need it: teachers are asked to rank in order of priority up to 3 students per class who meet the abovementioned criteria and whom they would like to include in the program. Figure 2 shows the histogram of the main reason why specific students are selected to participate in the program. This careful selection process helps to guarantee that the tutoring services are directed to students who need them the most. Furthermore, by partnering with schools, TOP ensures that the tutoring services are fully integrated with the regular school curriculum and complement classroom instruction. This also guarantees that the tutoring services do not create an additional burden for students, but instead provide them with targeted support that can enhance their learning experience.

Graph 2. Reasons for indicating the student (percentage)



Note: Absence of study method refers to students selected to participate in TOP because they need support in planning and organization of their homework and independent study. These students lacked a structured study approach, which was hindering their overall learning progress. “Learning Disabilities” refers to pupils who were selected to participate in the TOP program by their teacher because of dyslexia, dyscalculia, or other learning disabilities.

Source: Own elaboration based on Tutoring Online Program (TOP) data.

Program Implementation

The program is designed to be implemented in several phases. The first phase involves reaching out to potential participant schools via email to gauge their interest in the program. The research team sends an email to the school principal containing promotional materials, project information, and instructions for participation. If the school is interested, they are asked to provide a list of students who may benefit from the program based on the criteria outlined above, along with their contacts. The school is responsible for obtaining parental consent to share the contact information with the research team.

The research team conducts a direct outreach to families to assess their interest in participating in the program and collects the consent form from parents and the child's assent to participation in the research connected with the evaluation of TOP. If the family expresses interest, they are provided with a baseline questionnaire containing questions on the student's level of school enjoyment, measures of well-being, and socio-emotional skills such as grit and self-efficacy. Both parents and students are expected to complete separate questionnaires, and their applications will be considered complete only if both are submitted. This ensures that only willing participants are recruited and limits the risk of having students in the program who have been compelled to participate by their parents.

It is important to note that the family is not required to indicate the subject area in which they require support. This is determined by the teachers and is discussed directly between the tutors and the students. Crucially, families are informed that, while the research team will make every effort to assign a tutor to their child, this is not guaranteed due to administrative constraints or limited tutor availability. The use of baseline questionnaires provides the research team with a comprehensive understanding of the socio-emotional skills and well-being levels of the students before the program's intervention.

Concurrently, the research team initiates the recruitment process for tutors by sending an email to all currently enrolled university students, working with the administrative offices of each university. For the first edition of the program, three universities in the Milan area were involved, namely Università Bocconi, Università Bicocca, and Università Statale di Milano. Over time, the partnership has been enhanced including up to twelve Italian universities. Tutors are required to be available for a minimum of three hours per week for the entire duration of the program (36 hours in total) and are asked to indicate which subjects they would like to support students in - mathematics, Italian, and English. Furthermore, tutors are also asked to provide information about their prior tutoring or volunteering experience, as well as their motivation to participate in the program. The recruitment process is designed to be thorough and to identify prospective tutors who are committed to the program's goals and objectives.

In case the number of applications from the schools exceeds the number of available tutors, the Research Team randomly assigns tutors to students using an algorithm that takes into account various factors such as the subjects in which students require assistance, the subjects for which the tutor expressed availability, and the tutors' time availability.

As soon as tutors apply, they are invited to an introductory meeting and are provided with the information to participate in the compulsory tutor training, including an online meeting with the implementing partner on the child protection policy that tutors need to sign after the training before being matched with a tutee. The WeSchool platform

provides tutors with access to a comprehensive self-paced online training program that is divided into multiple modules. The training program is designed to equip tutors with the knowledge and skills they need to effectively support students' learning goals. In addition to the self-paced training, the implementing partner and the pedagogical team may also schedule additional synchronous training sessions for tutors.

Participation in the training program is mandatory for tutors, and they are strongly encouraged to take advantage of all available resources to optimize their tutoring sessions. The training modules are developed by a team of pedagogical experts and cover a wide range of topics relevant to tutoring, including:

- Rule of conducts,
- Child protection policy,
- Specific tips on how to teach math, Italian and English, learning styles and effective tutoring techniques,
- How to prepare for tutoring sessions,
- How to use online tools to facilitate learning,
- How to support students with special education needs.

Each training module includes a video and a series of summary slides that provide tutors with a clear understanding of the key concepts and strategies covered. The program also includes specific modules for each subject area in which students require support. Moreover, tutors receive ongoing pedagogical support throughout the program from their supervisor (a pedagogical expert in a determined area or subject), who provides guidance and feedback to help them continually improve their tutoring skills and better support students' learning. In addition to the comprehensive training provided to tutors, a range of resources are available to support them and ensure that they acquire the essential skills necessary for effective tutoring, including:

- A tutor handbook, which provides all necessary information on how to set up tutoring, including how to contact the assigned student's teacher(s) and family (with templates provided), platform usage, and contact information for support as needed, along with frequently asked questions (FAQs) about the program.

- Group meetings, moderated by supervisors, that tutors can sign up for. These meetings provide guidance on how to implement tutoring effectively and offer a place for sharing experiences with other tutors.
- Individual (ad-hoc) meetings with experts from the pedagogical team, available to tutors who need advice on handling specific cases. These meetings may include the participation in tutoring sessions of the supervisor to provide personal feedback to tutors.
- A forum accessible through the platform where tutors can discuss issues related to the technology used for tutoring, compare experiences, and receive support from experts. Tutors are reminded in the forum not to share their tutee's private information, such as their full name or contact information.

Tutors are informed that their availability for the entire duration of the study is required upon signing up. In the event that a tutor becomes unavailable, they are instructed to promptly inform the implementing partner. The team will then contact the family to inquire if they wish to continue with the program and arrange for a replacement tutor if necessary. The monitoring of the tutoring sessions is done automatically via the WeSchool platform, which registers the date and time of each session. If a tutor has no registered sessions in the past week, they get contacted by their supervisor to understand the reason.

At the conclusion of the project, a test is administered by the research team to assess the students' performance. The test follows the standardized format utilized by the Italian Institute for Evaluation of Education (INVALSI) and covers the three subjects of the tutoring program: Italian, math, and English. Irrespective of the subjects covered during tutoring, all students must independently complete the three sections of the test during their final class. Additionally, students, parents, and tutors are requested to complete an endline questionnaire, which evaluates their experience with the program. The questionnaire for students and parents contains similar questions as those included in the baseline assessment regarding socio-emotional skills, aspirations, and well-being.

On average, the program's overall **cost per student** amounts to approximately **50 euros**. This cost includes both the expenses of organizing and administering the program and providing educational support to the students. The program was financed with a contribution of JPAL during the second edition and it is fully supported by an Italian bank Foundation, Cariplo, since 2021.

Results

To assess the impact of the program, we used a Randomized Controlled Trial. The program had incredible success among schools and families in all editions, but due to organizational capacity constraints or – most importantly – the availability of tutors, TOP could accommodate only around 3,000 tutees from 2020 to 2023. We, therefore, proceeded with assigning tutors randomly to the pool of available middle school student applicants. The random assignment to the tutors allows for comparing the outcomes of those who received a tutor with the outcomes of those who did not receive one and interpreting them as the causal effect of the program. The research team collected data from students, parents, tutors, and teachers to conduct the evaluation, as well as administrative data from the Ministry of Education and test score data from the National Evaluation Center (INVALSI).

We evaluated how participating in the TOP program impacted students' learning process inputs, specifically the amount of time spent on homework and the quality of their participation in classes. Students in the TOP program spent more time on homework and were more committed to completing it regularly than those in the control group. We also found that the TOP program positively affected the quantity and quality of learning from classwork, as well as students' liking of the subjects. Overall, the results suggest that the work done by tutors outside of school hours complimented the work done by teachers during school hours and had a positive impact on students' participation in educational activities.

The program had overall very positive impacts on four key dimensions we analyzed since the first edition was implemented during the school closure in 2020:

- 1. Academic performance and beliefs:** the program had positive effects also on academic performance, measured through a standardized test in math, Italian and English administered at the end of the tutoring period, and on beliefs on students' academic performance. The test was developed in cooperation with two experienced middle school instructors, and it contained 7 multiple-choice questions in math and Italian, and 5 multiple-choice questions in English. The test resembles closely the

format of the National Evaluation students must complete at the end of middle school. Students in the control group on average got half of the questions (53%) right. Students who were assigned to a TOP tutor had a statistically significant 9% increase in the number of correct answers. This corresponds to a quite sizeable increase in the index of students' performance of 0.26 SD. Results from our administered tests were confirmed also by administrative data on teachers' assigned grades. This result is quite remarkable since the magnitude of this impact is similar to the average impact observed in large-scale in-person tutoring interventions, as indicated in the meta-analysis conducted by Nickow et al. (2020). Moreover, the program also had a positive impact on the beliefs held by students, parents, and teachers about the number of correct responses given by students in the test. Finally, we asked both teachers and students how they would rate the student's academic performance as opposed to the one of their other classmates. We observe that the treatment had a positive effect on both students' and instructors' evaluations of the student (respectively an increase of 0.25 and 0.33). This indicates that the program helped instructors and pupils reconcile their personal beliefs with their actual performance. The program had beneficial effects in all academic areas, but math performance saw the biggest improvements. We also observed that, in comparison to students who had access to better devices (tablet and laptop), who saw a 0.27 SD increase in the standardized test results, those who conducted the tutoring mostly via smartphones still saw a substantial 0.22 SD increase in their academic performance. This result is statistically significant at a 5% level. This sizeable effect is noteworthy, particularly in light of the likelihood that the students who only have smartphones belong to the socioeconomically most vulnerable group, which is also the group that experiences the greatest difficulties and disadvantages. This finding offers hope that online tutoring can be a useful tool even in low-income contexts where students may only have access to smartphones. Additionally, the significant effect size suggests that online tutoring can have a positive impact on student learning outcomes, even for disadvantaged groups.

2. Aspirations and perceived ability to achieve educational goals: overall, results suggest a positive effect of an aspiration index of 1.15 standard deviations, statistically significant at 10 percent level. Treated students and their parents appear less likely to plan to attend the least prestigious high-school track, vocational, and more likely to report that they plan to enroll in a university in the future.

3. Socio-emotional skills: The study finds a positive effect of around 0.14 standard deviations in the improvement in socio-emotional skills of students, statistically significant at 10. We examined whether the program had an impact on students' perseverance in the face of obstacles and their sense of control over their lives. To measure perseverance, we used a logic task and the self-reported scale of grit by

Duckworth and Quinn and found that while the direction of the effects suggested an increase in perseverance among treated students, the effect was not statistically significant. However, students in the TOP program demonstrated a greater sense of control over their lives (i.e. a stronger “locus of control”) than those in the control group. We hypothesize that this may be because the students could experience positive academic results from the program and this allowed them to realize that success in school was not just a matter of luck.

4. Well-being: while it was not the primary goal of the program, it is possible that it may have assisted students in managing the psychological challenges arising from the pandemic and isolation. Our results revealed that students who received treatment exhibited a decrease in symptoms of depression and increased levels of happiness. This suggests that the program may have had a positive impact in addressing mental health issues related to the pandemic and the difficult situation of a protracted lockdown that significantly limited the students’ social interaction outside the household. This positive effect is consistent across genders and among students with and without learning disorders. However, a comparison of native and immigrant students revealed that the observed increase in happiness and decrease in depression was mainly induced by the immigrant student group. This effect was found to be substantial, with a 0.77 SD increase in well-being. A plausible explanation for this phenomenon is that immigrant students may have had fewer social connections during the lockdown period, thus experiencing greater isolation. Their inability to meet with classmates in school or participate in online conversations through platforms such as WhatsApp may have greatly contributed to this social disconnect. Importantly, control group data revealed that, on average, immigrant students exhibited a 0.52 SD lower level of well-being than their native counterparts. Regular interaction with tutors was found to be particularly advantageous for their psychological well-being.

Furthermore, a noticeable trend that emerged from the data, albeit on a qualitative level, is that TOP had a greater effect on students whose parents both had jobs outside the home. These students may have received less assistance from their parents with schoolwork and may have been less supervised during remote learning. In these cases, consistent meetings with a tutor were particularly beneficial.

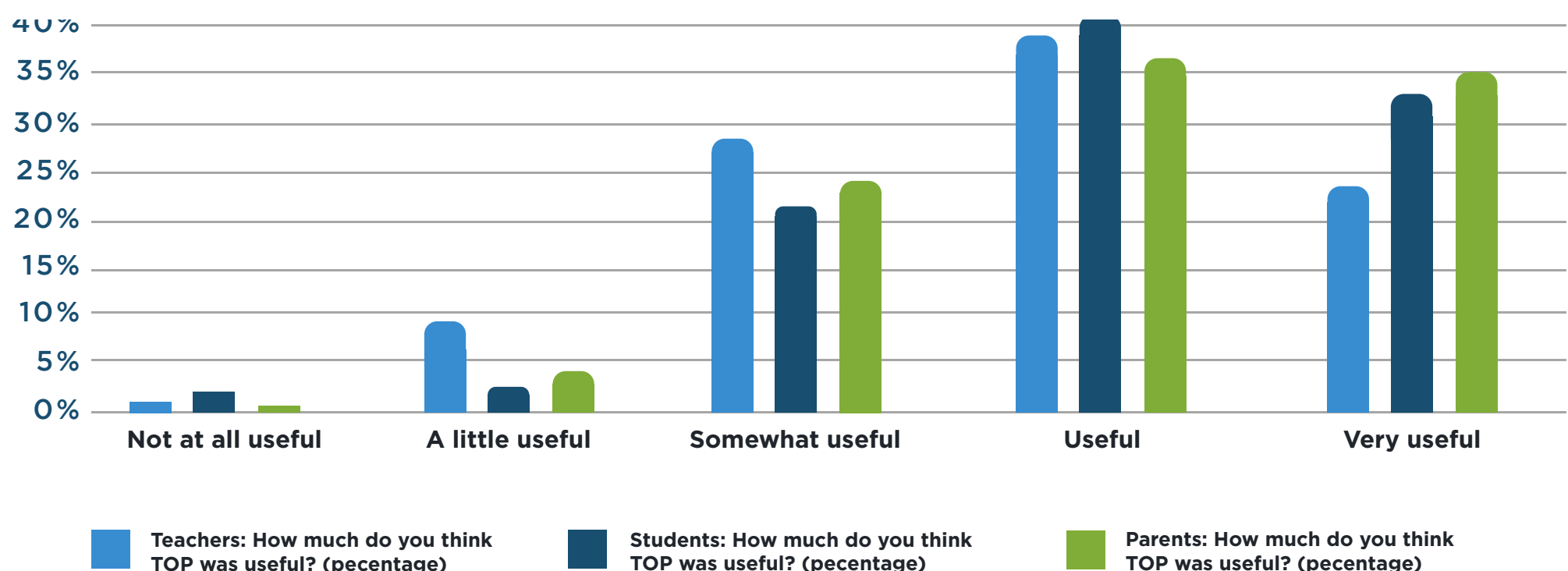
The positive results on academic outcomes of TOP described above for the implementation in 2020 during school closure were confirmed also in 2022 when students could regularly interact with their peers and teachers in schools. The improvement in test scores for students assigned to individual tutoring was around 0.21 standard deviations (statistically significant at 1 percent). However, the impacts on the indexes of aspirations, socio-emotional skills and well-being were not statistically significant at conventional level. This result suggests that

online tutoring during regular times may be effective in improving cognitive achievements, but do not lead the systematic positive results that were achieved when implemented during the lockdown in extreme isolation conditions.

Group tutoring. The research team also investigated the impact of group tutoring in 2022 to explore cost-effective improvements in the design of the intervention. Unfortunately, group tutoring online involves several challenges: students could not easily reschedule the meeting and could not benefit from the one-to-one interaction with the tutor to customize learning at the right level. The results show that online group tutoring had no statistically significant effect neither on academic performance nor on the other three dimensions collected (aspirations, socio-emotional skills, well-being).

Program satisfaction: Overall, the feedback was very positive, particularly regarding the tutors, with 92% of them stating that they would like to participate again. As reported in Figure 3, over 80% of students found the tutoring experience very useful, and less than 5% did not find it useful. Moreover, almost all the students expressed interest in participating in the project again with the same tutor. Likewise, parents were extremely satisfied with the program, with 72% rating the project as “useful” or “very useful”. Furthermore, almost all parents rated their child’s tutor as “excellent” or “good.” Teachers were also positive about the TOP project, with 62% of the teachers rating the program as “useful” and “very useful.” Almost 90% of teachers rated the tutors as “good” or “very good.” The school principals’ feedback also confirmed the positive reviews received from students, parents, and teachers. Almost all the school principals were satisfied with the project and expressed interest in participating in the program in the future.

Graph 3. Teachers’, Students’ and Parents’ Satisfaction of TOP program



Source: Own elaboration based on Tutoring Online Program (TOP) data.



Looking ahead: implications

The Tutoring Online Program (TOP) has emerged as a promising solution for addressing the learning loss and socio-emotional needs of disadvantaged students through remote tutoring. In light of the challenges posed by the pandemic, the TOP program has demonstrated its potential to provide an innovative and scalable response. However, beyond the current situation, the TOP program presents an opportunity to transform education and make it more accessible and inclusive for all.

A significant strength of the TOP program is its scalability and cost-effectiveness. By enabling remote tutoring, the program offers flexibility in scheduling and matching of students with tutors, making it easier to reach a large number of students in need. Additionally, the TOP program's utilization of volunteer tutors significantly decreases the cost of tutoring and helps mitigate the shortage of high-quality tutors in disadvantaged contexts and countries. Nevertheless, there are challenges that must be addressed to fully leverage the potential of remote tutoring under this model.

- **Tutor motivation and retention:** the use of volunteer tutors in the program has its advantages, but it also poses challenges in terms of tutor retention and motivation. Some tutors may find themselves in difficult situations, working with unmotivated tutees or struggling to connect with them on a personal level. This can lead to high tutor turnover rates, which is detrimental to the program's effectiveness as it disrupts the continuity of the learning process for the tutees. To address this issue, the program has implemented several measures to incentivize tutor participation and encourage them to stay engaged with the program until its completion. One such measure is the issuance of a certificate of participation from Bocconi University and Harvard University, which is only awarded to tutors who successfully complete the program. We are also exploring other incentives to keep tutors motivated to complete the program, such as offering university credits to tutors who are studying to become

teachers or randomly selecting some tutors to attend lessons at Harvard University after successfully completing at least one module of tutoring. However, it is important to strike a balance when offering incentives, as they can potentially crowd out the intrinsic motivation of tutors to participate in the program. Anecdotal evidence suggests that tutor dropout rates and program effectiveness may be influenced by the degree of matching between tutors and tutees. Given the current high availability of data, the research team is working on predicting the best matches between tutors and tutees that may help decreasing dropout and enhancing program effectiveness.

- **Access to devices and digital literacy:** The accessibility of a device and proficiency in digital literacy are crucial components for the success of the TOP program. To partake in the program, students must have access to a device that can be connected to the internet, and possess the necessary skills to utilize it proficiently. However, disadvantaged families may encounter difficulties in acquiring a device due to financial limitations or may lack the necessary digital literacy to enroll and maintain engagement in the program. In order to overcome these hurdles, strategic partnerships with NGOs or government programs can prove to be vital in providing access to devices and digital literacy training. It is important to note that in our project, access to devices and the internet was facilitated by the support of Fondazione Cariplo, who generously provided a tablet and internet connection to all students who were interested in participating but did not have access to these resources.
- **Tutor supply in specific subjects:** during the previous implementations of the program, the team experienced difficulties in recruiting an adequate number of tutors proficient in mathematics, which posed a significant challenge since most students required assistance in this subject. However, the team was able to overcome this issue by reopening the call for tutors. It's worth noting that this solution may not be feasible in countries where there is a shortage of available and qualified tutors.
- **Partnership with local organizations:** another significant challenge faced by the TOP program is the guarantee of its long-term sustainability and scalability. Even though the program has already been successfully implemented on a voluntary basis in several middle schools throughout Italy, expanding it to other regions and countries could require additional resources and coordination. To address this challenge, partnerships with NGOs or international organizations that have experience implementing educational programs in disadvantaged contexts are fundamental. By leveraging their expertise and resources, the program can reach out to more students in need and ensure that they receive the support they require to succeed.

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