POLICY REPORT

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TUTORING FOR EDUCATIONAL EQUITY

A high-impact, on-line tutoring programme for disadvantaged pupils in response to Covid-19

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Executive Summary

→ The pandemic, school closures and the economic crisis have had a tremendously negative impact on the learning and emotional development of pupils around the world according to the first studies using real-time data gathered in Belgium, the Netherlands, Germany, Switzerland, Australia, and the United States. A study carried out in Belgium by Maldonado and De Witte (2020), for example, found that although classrooms were closed for only three months (one third of the school year), the loss of learning in mathematics was equivalent to more than half a school year.

→ This learning loss hit pupils from vulnerable backgrounds far harder. Whereas middle- and upper-class families were able to offset school closures by giving their children more resources, support and time, many low-income families were less able to give their children quality time and support. A study of 350,000 pupils in the Netherlands by Burgess and Sievertsen (2020) revealed that pupils from families with a low level of education lost 40% more learning than the average pupil.

→ The education crisis caused by Covid-19 is a 'silent' crisis: Its impact is far less visible than that of the health or economic crisis. Nonetheless, its effects on educational development, children's emotional well-being, equality and economic growth are equally serious. Unless effective public policies are implemented to counteract this situation, the pandemic will cause education gaps to widen and very considerable reductions in opportunities, social cohesion, and economic growth in the future.

→ The evidence gathered by over 100 experimental studies shows that small group tutoring programmes are, together with education for children aged 0 to 3 years, one of the most effective investments in education. In the spring of 2021, EsadeEcPol and the Fundación Empieza Por Educar (ExE) launched *Menttores*, an innovative programme providing free, on-line, two-to-one afterschool tutoring for deprived pupils hardest hit by Covid-19.

→ The programme was evaluated using an experimental method with maximum scientific rigor in the form of a randomized controlled trial (RCT). This methodology is rarely used in Spain to assess public policies, but commonly used in other countries to assess education projects and other types of public policies. This experimental design entails the creation of two statistically equivalent groups selected at random – an intervention group that takes part in the programme and a control group that does not – and enables the estimation of the causal impact of any intervention.

→ *Menttores* consisted of an 8-week long, intensive online tutoring program, with three 50-minute sessions a week for pupils aged 12 to 15 (years one and two of compulsory secondary education) in 18 state and grant-assisted schools *(colegios concertados)* in the Region of Madrid and Catalonia (Barcelona and Lleida). Priority was given to schools in low-income districts with a high share of immigrants, such as Usera and Vallecas in Madrid, Cornellà in Barcelona, and the city of Lleida. Taking part in the evaluation were 378 pupils: 206 received tutoring (intervention or treatment group) and 172 did not (control

group). All afterschool tutoring was carried out using digital devices and the Google Workspace platform in groups of two pupils per mentor and focused on maths and social-emotional support (motivation, well-being, work routines).

→ Fifty-two academic mentors took part in the programme. Forty-five of them were paid-for, qualified secondary school teachers. The remainder were volunteers. They underwent a thorough selection process involving more than 500 applicants and received intense training from ExE.

→ To the best of our knowledge, *Menttores* is the world's first tutoring programme provided entirely on-line by qualified teachers and assessed through an experimental methodology. The results of the study have been remarkably positive for pupils in terms of both academic outcomes as well as socio-emotional outcomes. The programme was completed by 96.6% of pupils, attending an average of 17 sessions (70.8% of all sessions) and 920 minutes (76.7% of the target).

In **academic terms,** the results show that pupils taking part in the programme experienced a significant improvement in various dimensions:

— The programme led to a 17% increase in end-of-year maths grades, the equivalent of six months of learning.

— Children who took part in the programme were 30% more likely to pass the subject (maths) than children in the control group.

— The pupils given tutoring also experienced a 17% improvement in the standardized maths test designed by our pedagogical team.

— The *Menttores* programme reduced the share of pupils repeating the academic year by 8.9 percentage points, equivalent to a reduction by 75% compared to the control group.

The programme also had a positive impact on pupils' **socioemotional** wellbeing and **aspirations:**

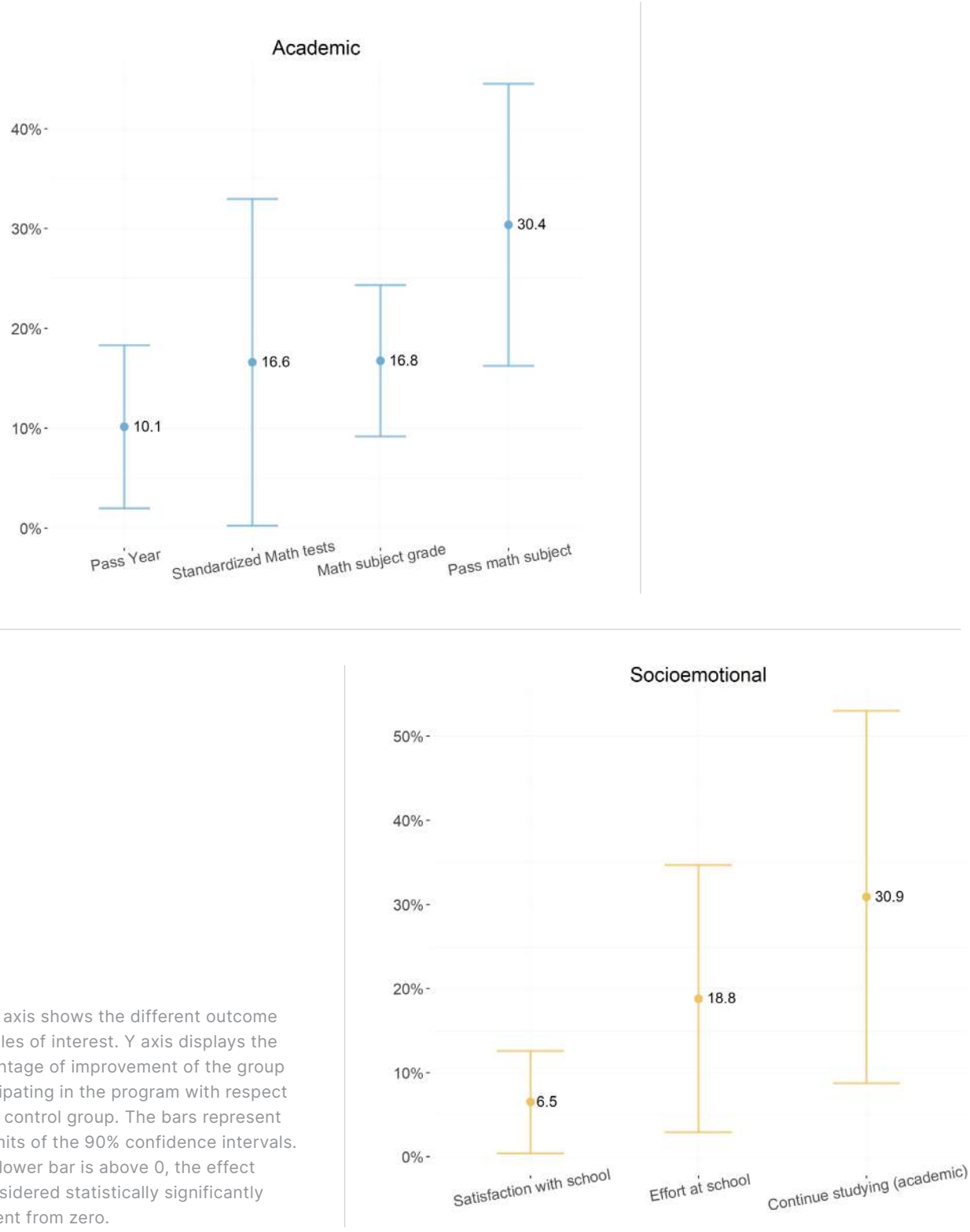
— Pupils participating in *Menttores* were 31% more likely to want to continue studying the academic track in upper secondary school (post-compulsory secondary schooling) than those who did not.

— Satisfaction with school amongst pupils taking part in *Menttores* improved considerably (7% compared to the control group).

— The likelihood of pupils saying they made an effort at school was 19% higher amongst those in the intervention group than those in the control group.

Figure. Programme results

Improvement of intervention group versus control group (in %)



The X axis shows the different outcome variables of interest. Y axis displays the percentage of improvement of the group participating in the program with respect to the control group. The bars represent the limits of the 90% confidence intervals. If the lower bar is above 0, the effect is considered statistically significantly different from zero.

The quality of pupils' **internet connection** also affected the results: the outcome of the programme was more positive amongst pupils who did not experience connection problems. A greater impact was also observed amongst pupils in the second year of secondary school. Finally, a greater impact was observed amongst children with immigrant background and single-parent families (although, due to the size of the sample, these differences were not statistically significant).

Finally, in the **satisfaction surveys** at the end of the programme, the families, maths teachers and school heads said they were very satisfied with the positive impact of the programme on pupils. According to 95% of mentors, a programme like *Menttores* should be available to all the pupils who need it.

'The help and guidance and having small groups of just two classmates were all very positive.'

School headteacher

'Mentors' follow-up of the task was very positive and the regular weekly meetings, the empathy between certain pupils and their mentors, and how they showed pupils that they were able to do it. Congratulations to the mentors and those who designed the programme.'

Maths teacher at a school

'At our school and because of the type of pupils we teach, one key factor is that the programme is free of charge. I'm sure that many families have been able to take part because of this.'

School headteacher

'It was very useful for pupils to get personalised attention and help with their schoolwork. Sometimes pupils couldn´t cope with math by themselves. The help from the mentors made a huge difference.'

Maths teacher at a school

- → The *Menttores* programme shows that online tutoring with small groups achieve good results in Spain that are similar to those of face-to-face tutoring rigorously assessed in other countries. This provides an opportunity to design more accessible and inclusive programmes in different regions for the neediest pupils, including those in rural areas where programmes of this sort are not yet available.

- → Several neighbouring countries have announced unprecedented, multimillion investments in catch-up programmes during and after school. The most ambitious example is possibly the Netherlands, with a three-year budget of €8.5bn (about €1,000 per pupil per annum). The situation in Spain was already giving cause for concern as regards academic results, drop-out rates, and education gaps. So far, unfortunately, the investment earmarked for post-pandemic education catch-up programmes is still comparatively low.

- → The huge amount of finance available in the form of EU funds should enable the implementation of an education catch-up programme far superior to the three-year programme announced by Spain's government and autonomous regions (PROA+) of about €360 million. Our proposal is to increase this figure tenfold, to €3.6 billion in three years (€1.2 billion per annum). Looking ahead, tutoring programmes rigorously evaluated beforehand should become a staple of the education policies of all governments. Few investments have such great returns as scaling up a programme of this type. If the *Menttores* results are extrapolated only as regards the successful reduction of pupils repeating a school year, the government would save some €1.2 billion per annum, i.e., the same as the cost of the scaling up suggested here.

1 | Why a tutoring programme?

A. THE IMPACT OF COVID-19 ON STUDENTS

The closure of schools because of the pandemic impacted very negatively on pupils' education around the globe. This is shown by the first studies with real-time data gathered in June and September 2020 in Belgium, the Netherlands, Germany, Switzerland, Australia, and the United States (see Table 1). A study carried out by Maldonado and De Witte (2020) in Belgium, for example, found that as regards pupils in year 6 of primary education, school performance fell by 18.6% of a standard deviation in maths and 28.6% of a standard deviation in language. Although classrooms in Belgium were closed for only three months (a third of the school year), the loss in maths was equivalent to more than half of what is learnt in a full school year.

Learning losses hit pupils from vulnerable backgrounds far harder, causing education gaps to widen. Whereas middle- and upper-class families were able to offset confinement by dedicating more resources, support and time to their children, many low-income families (more liable to be affected by redundancies, furloughing or the like, or be key-sector workers) were less able to provide support and quality time for their children. An experimental study of 350,000 pupils in the Netherlands by Burgess and Sievertsen (2020), for example, revealed that as regards pupils from families with a low level of education, outcomes worsened by 11% of a standard deviation after eight weeks of lockdown, 40% more than the learning loss experienced by the average pupil. According to data published by Bonal and Gonzalez (2020) for Catalonia, educational provision was distributed unevenly: during the first weeks of the lockdown, almost 30% of pupils – mainly from low-income families – had virtually no classes or contact with their teachers or tutors. These early data reflect the direct impact that school closures had on classes during the first months of the pandemic, but other factors, also unevenly spread, must also be considered: the economic crisis, further occasional school closures during the 2020-21 year and also the impact on the social and emotional development of pupils after an extremely complex year.

The start of the 2020-21 school year in Spain was a success in terms of controlling infection but time and space restrictions have been obstacles to getting classes back on the pre-pandemic track. The re-opening of schools during the 2020-21 academic year was highly successful in Spain. According to the Spanish Ministry of Education (MEFP), at no time during the first two term of the 2020-21 year were more than 2% of classrooms closed (MEFP, 2021). This was thanks to the recruitment of more teachers and significant efforts by schools, but also to reducing face-to-face classes at school. Blended and on-line models at the end of secondary school and the upsurge in schools teaching in the morning only have meant less time at school and less time for socialisation. Recommendations regarding bubbles, social distancing and face masks have also limited more informal interactions between pupils, and between pupils and teachers, all of which makes pupil-school relationships and the socialisation in the classroom more complicated.

Table 1.
Scientific studies about the impact of school closures on learning

Study	Country	Sample of pupils	School year	Impact
Maldonado & De Witte (2020)	Belgium	Not specified	Year 6	Negative impact on maths and language but not social sciences. Increased inequality between schools.
Engzell, P., Frey, A., & Verhagen, M. D. (2020)	Netherlands	350,000	Years 4-7	Negative impact on maths, spelling and reading. Learning loss far higher amongst children in homes where parents have low levels of education.
Haelermans, C., Aarts, B., Abbink, H., Jacobs, M., van Vugt, L., van Wetten, S., van der Velden, R. (2021)	Netherlands	450,000	Years 1-6	Negative impact on maths and reading. Learning loss far higher amongst children in households where parents have low levels of education, single-parent households, and households with several children.
Schult, Mahler, Fauth & Lindner (2021)	Germany	>80,000	Year 5	Slightly negative effect in general on maths and reading. Widening gaps in maths.
Tomasik, Helbling & Moser (2020)	Switzerland	28,500	Years 6-9	No impact observed in secondary education. Impact in primary education in maths and language. Greater inequality in learning.
Jennifer Gore, et al. (2020)	Australia	>4,800	Year 3	No impact observed in general except on vulnerable groups in maths.
Kuhfeld et al. (2020)	USA	4,400,000	Years 3-8	Negative impact on maths but not on reading. More negative impact amongst vulnerable racial groups.
Tommaso et al. (2021)	Italy	1,044	Year 3	Negative impact on maths equivalent to four months' schooling. Greater learning loss amongst boys with university-educated parents and girls with low educated parents.
Blainey and Hannay (2021)	United Kingdom	250,000	Years 1-6	Greater learning loss in autumn than in winter 2020. Greater learning loss amongst low-income pupils and those with learning difficulties.

In Spain, we do not know the true impact of the pandemic on pupils' education and well-being. Now that the Covid-19 pandemic is much more under control, the 2021-22 school year looks quite normal. Pupils of all ages are going back to face-to-face classes at school. So, apart from possible surprises, the impact of the pandemic on schooling is likely limited to a 15-month period: the pandemic began in March 2020 (with the great lockdown) and ended in June 2021 (at end of the difficult 2020-21 school year). Teachers and school management teams make it quite clear in off-the-cuff conversations that there has been an enormous loss of learning, a widening in learning gaps and a decline in pupils' well-being, their attachment to school and their socio-emotional development. However, unlike in other countries, so far there is no available data gathered from large samples of pupils to estimate the magnitude of the problem, how it manifests itself (e.g., increased truancy), nor the characteristics of pupils (level of education, socio-economic background, or pupil profile) most affected by it.

The situation in Spain was already a cause for concern as regards academic results, drop-out rates, and educational gaps. In Spain, school results and drop-out rates are very closely related to pupils' socio-economic background (according to the Spanish Government's *Oficina Nacional de Prospectiva y Estrategia,* 2021). For example, children from low-income families are four times more likely to repeat a year than children from wealthy families (Save the Children, 2019). Despite improvements in recent years, Spain is still the EU member state with the highest drop-out rate – almost twice the EU average. Gaps in learning and academic progress begin to appear in primary education and then widen during secondary education, first with pupils repeating years, followed by failure, and dropping out.

B. INTERNATIONAL EVIDENCE ABOUT SMALL-GROUP TUTORING

Small group tutoring has been shown to be an effective educational catch-up intervention for vulnerable pupils. At the present time, direct support is obviously needed immediately for pupils from vulnerable backgrounds, including more educational, social and emotional support. The dozens of randomised studies carried out around the globe before and during the Covid-19 pandemic have shown face-to-face, personalised tutoring in small groups to be highly effective in enabling pupils to catch up their lost academic learning and wellbeing (see for instance Nickow, Oreopoulos and Quan (2020) and Carlana and La Ferrara (2021)). In the Covid-19 context, they have enormous potential for facilitating learning recuperation and tackling the educational disengagement of tens of thousands of pupils (Education Endowment Foundation, 2020).

'My daughter has always struggled with maths, partly because she doesn't think she can do it well, and when you think you're not going to do something well, it's hard to make progress.'

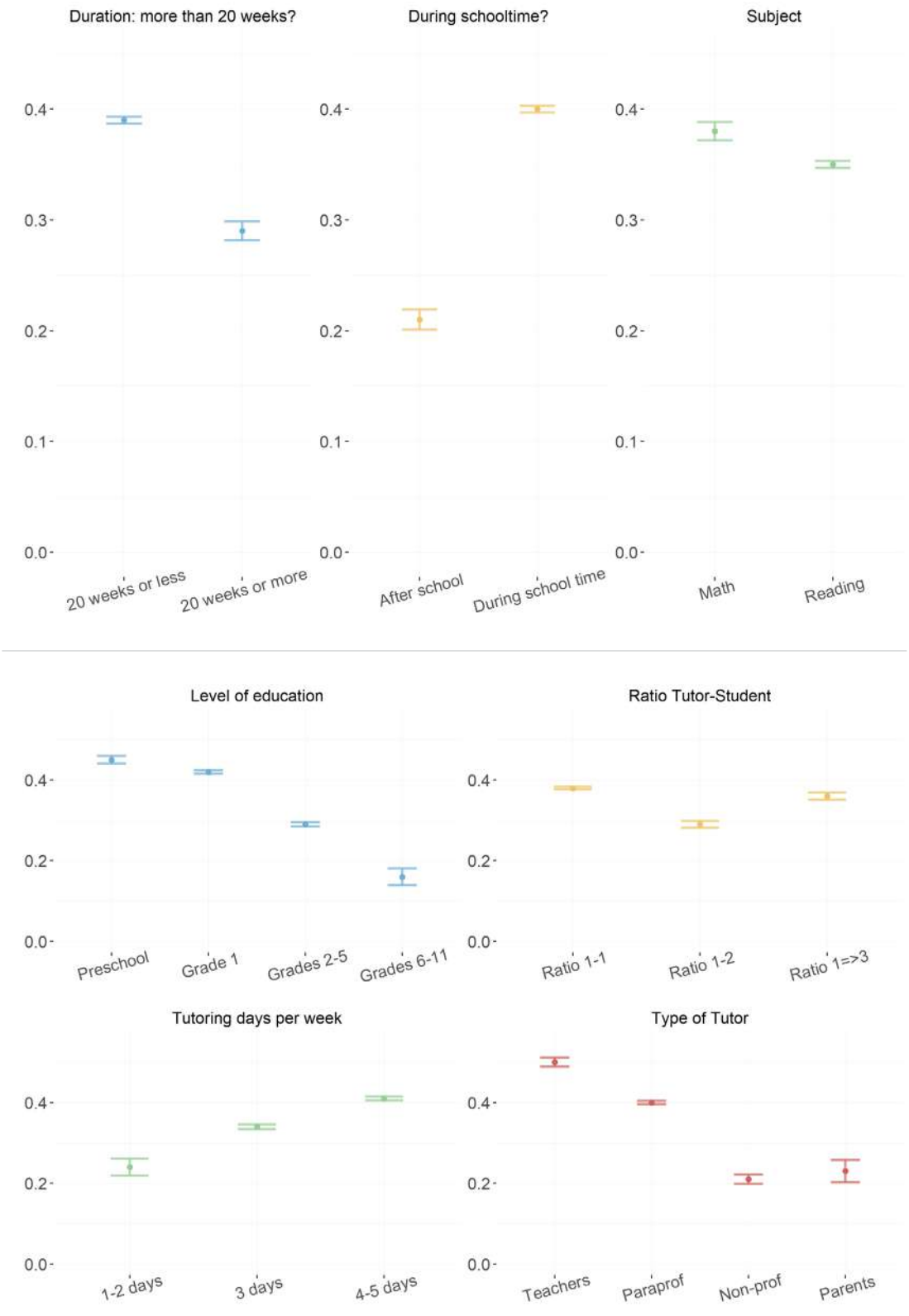
Mother

A review of the most recent literature (Nickow, Oreopoulos and Quan, 2020) shows that tutoring for pupils lagging behind and from low-income groups are most effective in the following circumstances:

1. **Content.** Primary school pupils have better results in reading, whilst secondary pupils have better results in maths.
2. **Age.** The impact is highest in the early years of primary school and gradually falls, although it remains significant in secondary school.
3. **Format.** Tutoring with groups of one to three pupils have similar effects.
4. **Frequency.** Intensive programmes (fewer than 20 weeks) with more days per week of tutoring (3 or 4-5) have greater impact.
5. **Type of mentor.** Evidence is far more robust with qualified teachers and paraprofessionals than for volunteers or parents.
6. **Time of tutoring.** Programmes are more effective during school hours than after school.

Figure 1. Effect Size of tutoring programmes on student achievement (CI 95%)

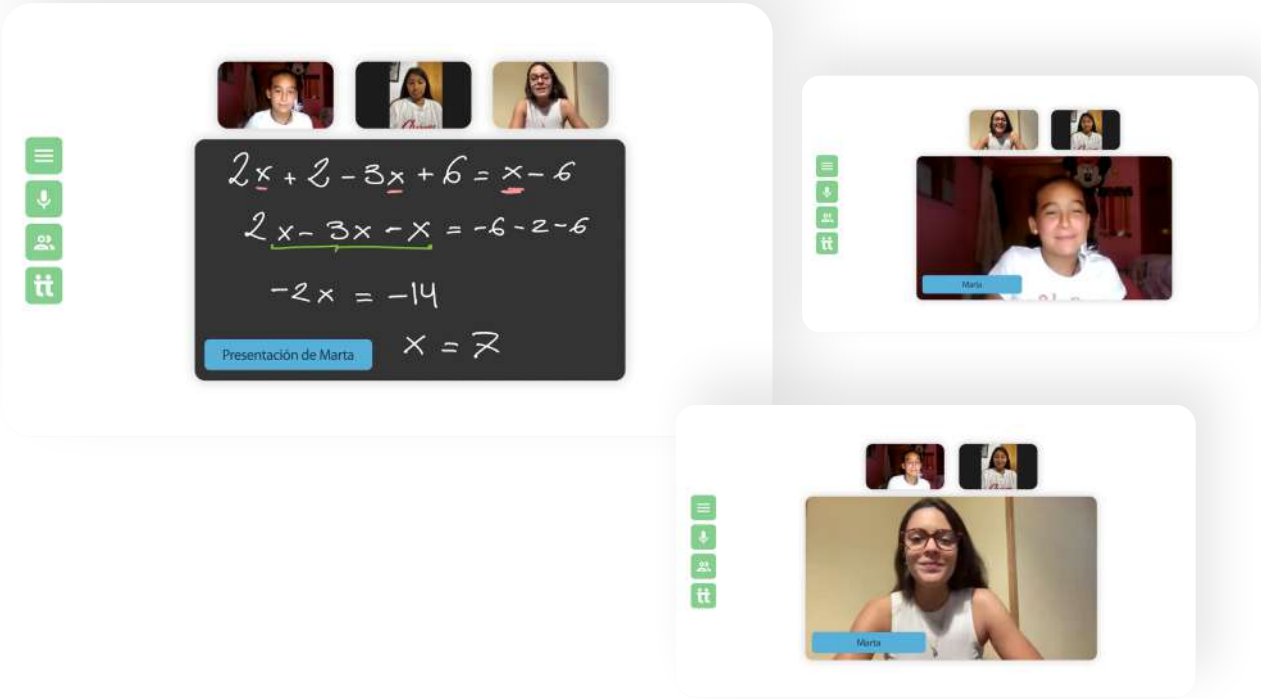
Measured in standard deviations of student learning



Source: Figure based on results in Nickow, Oreopoulos and Quan (2020) | EsadeEcPol

Tutoring sessions are a trusted space that fosters personalised learning and pupil development by forging a close connection between the mentor and the pupil. This connection may be even more important in the Covid-19 scenario, precisely because of pupils' needs in such challenging times. In addition, this programme can be an experience in learning/service for mentors that could help create new links and enhance the mentors' own pro-social attitudes (Carlana and La Ferrara, 2021).

In the Covid-19 context, tutoring may also fulfil pupils' personal and emotional needs, reaching more pupils by being online. Restrictions on face-to-face activities made it necessary to consider virtual types of tutoring which, together with the enormous increase in the use of technology in schools from March 2020, could offset the reduction in face-to-face classes. During the great lockdown of 2020 in Italy, for example, Carlana and La Ferrara (2021) designed an experimental project (a controlled randomised trial) of online tutoring by assigning volunteer university students to schoolchildren nationwide. Although the context is quite specific (the tutoring sessions often were the only formal learning students were receiving during this period), considerable progress was observed in maths and socio-emotional skills, academic aspirations, and psychological wellbeing. Our proposal has considered the findings of recent research and the educational and logistical constraints of the 2020-21 year.



2 | What is *Menttores?*

Menttores is a free of charge tutoring programme in maths and socio-emotional skills for pupils with high deficits in maths and hit hardest by Covid-19-induced learning losses. The programme lasted **eight weeks,** with three 50-min sessions a week during **April and May 2021,** for 378 pupils in **lower secondary school years one and two** from 18 schools in deprived areas of **Madrid and Catalonia.**

Tutoring sessions were given mainly by **professional mentors** (qualified teachers), each with a **group of two pupils from the same class.** The tutoring focussed on afterschool help in **maths and socio-emotional support** (motivation, wellbeing, work routines) and had an innovative **online format** using digital devices. The aim was to help and support the neediest pupils during the 2020-21 year to close the widening education gap and give them a boost before the end of the year.

From the outset, **an experimental approach was used for assessing the programme's impact,** realising the importance of having a robust scientific assessment of the results. We therefore designed the programme as a randomised controlled trial (RCT), the methodology most widely accepted in the academic literature for assessments of this type. The methodology consisted of randomly selecting an intervention group (in our case, 206 pupils receiving tutoring) and a statistically equivalent control group (in our case another 172 pupils not receiving tutoring).

In the following section we will explain the programme implementation in detail: (a) selection and training of mentors; (b) selection of pupils; (c) form and content of tutoring; (d) online structure of tutoring; and (e) real-time follow-up of tutoring. A crucial factor throughout this process was ExE team's hands-on knowledge after more than 10 years of experience working in vulnerable settings.

A. SELECTION AND TRAINING OF MENTORS: THE EXPERIENCE OF THE EXE MODEL

ExE managed the recruitment of professional mentors although a small number of volunteers were added. The minimum requirement for the professional mentors, who were paid for the tutoring, was a master in teacher training with a scientific specialization. Recruitment was conducted via several channels: employment websites; ExE teacher databases; teachers in organisations and schools near ExE. Volunteers were recruited by sending invitations for applications through various large Spanish universities. Due to the timing of the programme, which coincided with the end of the semester for many university students, much fewer volunteers applied to become mentors than initially estimated.

The selection process involved filling out an enrolment form, analysis of CVs, and individual interviews by the ExE team. The aim was to identify the applicants with the professional skills necessary to ensure the success of the programme: motivation, ability to communicate and provide feedback, able to teach maths, experience, commitment to the project, and digital skills. More than 500 applications were received from which a total of 52 mentors were selected: 45 paid professionals and 7 volunteers.

All mentors were given intensive and flexible training by ExE using their digital learning platform. The training consisted of two parts. Firstly, online training modules, which mentors did at their own pace and in their own time; and secondly, two webinars by expert teachers. Training during webinars focussed on the following key areas: (i) how pupils learn; (ii) lesson planning; (iii) learning assessment; (iv) pupil motivation; (v) maths teaching; (vi) tutoring methodology; (vii) information about child protection and online teaching; and (viii) use of Google Workspace. Teacher training design is ExE's core activity, based on the best teaching practices to improve the learning of vulnerable pupils (Lemov, 2010; Farr, 2010; Angrist et al, 2013).

B. SELECTION OF PUPILS AND 2-TO-1 FORMAT

ExE identified schools attended by pupils from deprived backgrounds in Madrid and Catalonia and then invited these schools to take part in the project. Priority was given to schools in low-income districts with a high percentage of immigrant pupils such as Usera and Vallecas in Madrid, Cornellà in Barcelona, and Lleida. Of all the schools interested, 18 finally took part: 12 in Madrid and 6 in Catalonia.

Collaboration with school heads was based on cooperation and transparency. To be part of the programme, school directors committed to collaborate with the following tasks:

(a) Identify the most suitable pupils for the programme, i.e., those with the most difficulties in maths. School headteachers knew that only some of the pupils chosen could take part because, as per the design of the assessment, the others would be in the control group.

(b) Conduct a survey and maths test at the beginning and end of the programme amongst all pupils in secondary school years one and two.

(c) Establish a framework for coordinating pupils' maths teachers with tutors throughout the programme to better understand the circumstances facing the pupils and ensure the greatest possible impact.

Online enrolment for first- and second-year pupils at those schools opened in February, gathering details about the socio-economic background of the family and pupils and their academic record. Pupils' parents or main carers were asked to give their Informed consent to (1) take part in the impact assessment study and (2) use the data gathered during registration, surveys, and tests for research purposes.

'The help and support and small groups of two (from the same class) have been very positive.'

School headteacher

'Sometimes pupils didn't do their schoolwork because they couldn't cope with math it by themselves. The help from the mentor made a huge difference.'

Maths teacher at the school

'The families are very enthusiastic about the programme, it's great seeing how involved they are. They're really helping their children. It's so reassuring knowing there's a family in the background, supporting the pupils and letting them carry on with the classes.'

Mentor

The pupils in the programme who finally took the tutoring were chosen at random from all those who signed up. Of the 378 pupils who signed up, 206 were assigned to the intervention group and 172 to the control group. Although control group pupils did not receive the tutoring, their collaboration in data gathering was essential to be able to study the impact achieved and improve the possibilities of organising future programmes.

The tutoring sessions were given on a 2-to-1 basis (two pupils per mentor). It was decided to hold tutoring with two pupils for three reasons. Firstly, according to available scientific evidence, 2-to-1 tutoring is only slightly less effective than individual tutoring (Nickow et al., 2020). Secondly, the presence of another pupil from the same class and same school might help create positive, cooperative dynamics and reduce possible non-attendance. Thirdly, for economic reasons: 2-to-1 tutoring enable twice as many pupils to take part with the same budget as 1-to-1 tutoring.

There are just two pupils, this makes leaning much easier. The mentor knows how to motivate them and explains things really well. If he has to stay a bit longer, he does.'

Mother

'She didn't "just" make my daughter like maths. Now she wants to do her homework. She wants to study. She gets up at 5am to revise for exams. She's more confident and has a better attitude. She trusts her.'

Mother

C. TUTORING MODEL AND METHODOLOGY: MATHS AND SOCIOEMOTIONAL SUPPORT

The tutoring sessions were designed by ExE to help pupils catch up in maths and, in parallel, improve pupils' social and emotional skills, including aims, motivation, self-reliance, and introspection. Each session was meticulously planned on the basis of shared learning goals, and organised in time slots for explaining, practising and going over what was learnt. ExE drew on their teaching experience to suggest the main contents from the secondary-school maths curriculum. From then onwards, the mentor was free to delve deeper or add to the content to be covered by tutoring depending on pupils' specific needs.

D. DIGITAL ORGANISATION OF TUTORING

Before starting the programme, we made sure that every pupil had an electronic device and internet connection. When schools were first closed in 2020, a considerable percentage of pupils had no access to devices at home (COTEC, 2020), mainly those in the deprived households that we target. Spain's Ministry of Education and regional governments went to great lengths to buy and lend devices to schools during the 2020-21 year, enabling most pupils on the programme to have access to devices beforehand. We bought ten devices to lend to pupils who had no access to one either at school or at home. These devices were subsequently donated to the schools.

We opted for an online format due to the Covid-19 scenario and the lower travel and transaction costs. Restrictions on face-to-face interaction throughout the 2020-21 school year, both inside and outside schools, called for a flexible and remote model. The online format also allowed us to work with mentors spread across the country. The virtual environment used was Google Workspace, a free service developed by Google. The project used mainly Calendar functions to schedule sessions, Meet for video calls, Jamboard to do exercises in a notebook shared by the mentor and pupils, and Classroom and/or Drive to share resources. Jamboard made it possible to overcome the main challenge identified at the outset: the lack of a real-time workbook shared by the mentor and pupils. Jamboard made it possible to share a screen in real time where problems, and most importantly, queries can be solved – a crucial aspect of pupil development.

E. REAL-TIME DATA COLLECTION AND FOLLOW-UP

Technology enabled us to record mentor-pupil interaction in real time. This data gathering was essential to correctly analyse the factors that might influence the programme outcomes. Accounts were created in Google Workspace for both mentors and pupils and they were all asked to do the tutoring using Meet and the assigned accounts in order for all interactions to be recorded in the *Menttores* domain and ensure a safe and secure environment for everyone – and pupils in particular. This allowed us to identify issues with the connection and quality of video calls. The data extracted from Google Workspace enabled us to create a management and monitoring dashboard. The collaboration with Edvolution, our technology partner, was c**rucial throughout this process.**

The advantages of having real-time data are numerous. For example, in the first weeks it enabled us to identify pupils who attended few or no tutoring, and draw up plans of action with mentors, families, and schools to help get them back into the programme.

3 | How have we assessed the impact of the project?

In Spain, public policies and interventions in education are rarely assessed using rigorous scientific methods. The impact evaluation of the *Menttores* programme uses an experimental methodology, the randomised controlled trial, or RCT, which is the 'gold standard' in scientific research. This methodology enables us to isolate the causal effect of an intervention and identify its impact by randomly assigning pupils to an intervention group and a control group. In March 2021, we registered the research project with the American Economic Association, with complete transparency on the aims and methods of the project (AEA RCT Registry, 2021). The project also has received ethics clearance from the research ethics committee of the Ramon Llull University.

We collected data throughout the project, always with the consent of all parties, in compliance with current regulations, and for research purposes only. Figure 2 shows the project timeline and the key moments for impact assessment and data collection. Data collected from relevant stakeholders is summarised below:[1]

- **Data on pupils and families.** During enrolment, we collected general information on all the pupils and families participating in the study. This made it possible to identify baseline differences between pupils that could lead to differences in the outcomes of the intervention, and so isolate the results from these differences.

- **Baseline and endline standardised test in mathematics.** To identify differences more accurately between the control and intervention groups, a standardised multiple-choice mathematics test was administered at the start of the programme (without linking it to the *Menttores* programme). At the end of the programme, the same test was administered to measure academic progress during the programme. The test was designed by ExE's pedagogical team as appropriate for each educational level. The test was taken by both study participants and non-participants during regular class hours at their schools.

- **Base- and endline survey of the socio-emotional status of pupils.** Questions on emotional well-being, confidence, and academic aspirations after graduating from secondary school, among others, were asked both before the start of the programme as well as after it ended. The surveys were taken during class hours

1 There is no single method for choosing which instruments and metrics to use to assess and access the most useful research: what is important is that the chosen method (given a chosen metric) enables isolating the effect of the intervention on the control group. For example, an overemphasis on academic outcomes hides other elements related to processes or other types of outcomes (e.g., socio-emotional development) that are equally important for the overall school success of a pupil (Jackson, 2018). Our approach is therefore hybrid and based on multiple metrics: collected at different points in time and supported by the power of technology to access more and better information in real time.

by all students (participants and non-participants in the study) before the standardized maths tests.

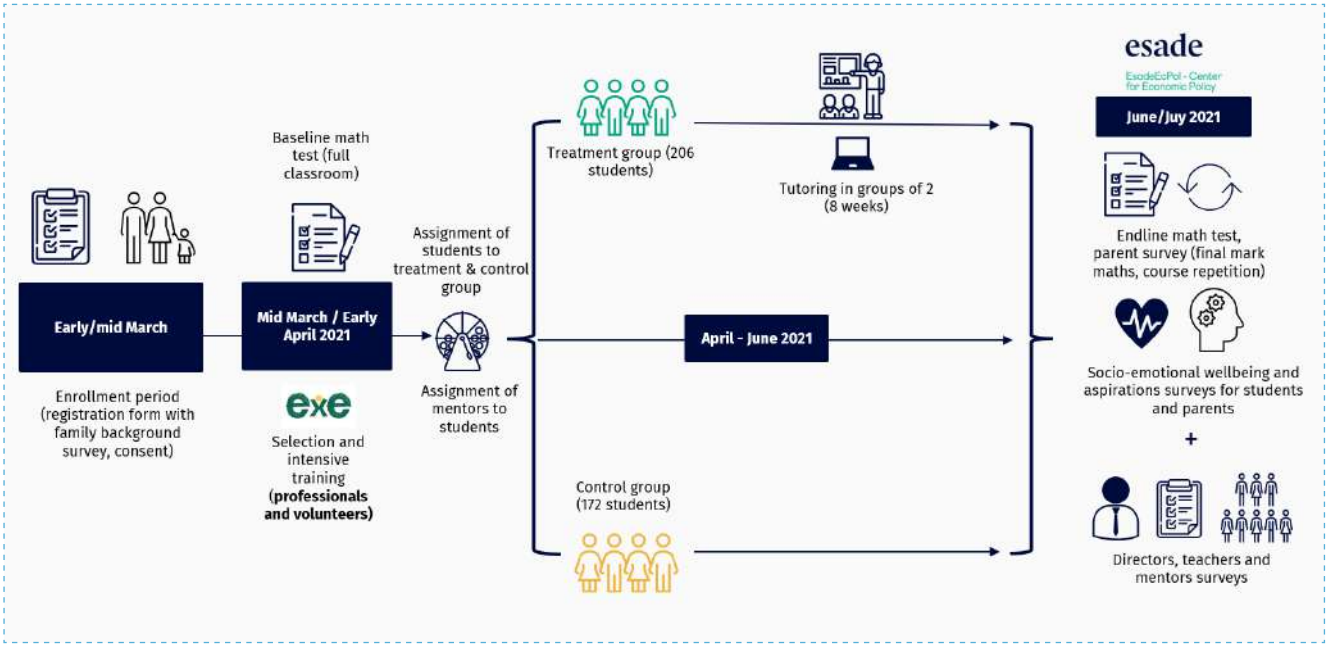
- **Real-time information during tutoring.** From the dashboard created for the implementation of the project, we had information about the course of each tutoring session (participation, connection time, quality of the connection, brief mentor evaluation).

- **Survey of school headteachers**. To understand the functioning of the school, we collected information on the course of the 2020/21 school year (closure of classrooms and partial confinements), pupil characteristics, and opinions about the programme.

- **Endline survey of families.** We collected information on the school results of the year (final grade in mathematics, and promotion or repetition of school year), as well as satisfaction with the programme, vision of their child's progress, and whether they participated in other reinforcement programmes.

- **Endline mentor survey.** We collected information to understand their level of satisfaction with the programme, and their assessment of the academic and socio-emotional progress of the pupils they mentored.

Figure 2.
Time-line of programme implementation and data collection



4 | Results of the impact evaluation

A. PUPIL CHARACTERISTICS

The programme targeted pupils from socio-economically disadvantaged backgrounds who needed mathematics reinforcement. An analysis of the characteristics of the pupils who took part in the impact evaluation shows that we achieved the objective of reaching the pupils who needed it most. Table 2 shows a summary of these characteristics. Among those initially enrolled (all participants in the study), there is a high percentage of pupils with foreign-born parents (46%), 42% of the pupils live in households with an income of less than €1,000 per month, 52% of parents have at most lower secondary education, and 28% are single-parent families.

As for the pupils, 78% had failed at least one subject in the first assessment (first semester of the 2020/21 school year), almost one-in-three pupils had repeated a year at least once, and 16% did not attend online classes during the school closures between March and June 2020.

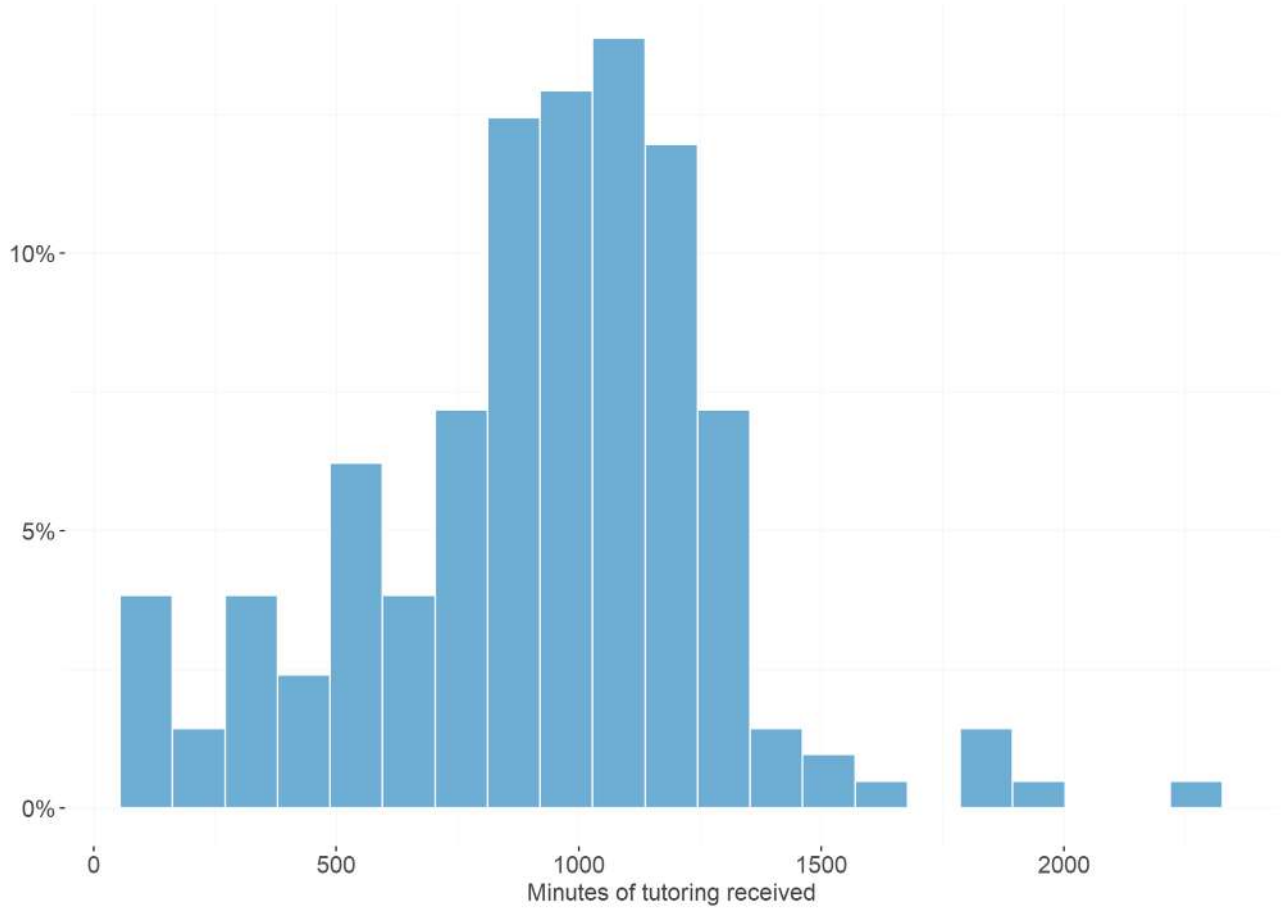
Tabla 2. Characteristics of pupils and their families

	Característica	Valor
Family characteristics	Foreign-born parent	46%
	Household income less than €1,000/month	42%
	Compulsory lower secondary education or less (ESO in Spain)	52%
	Single-parent families	28%
Pupil characteristics	Gender	48% girls, 52% boys
	Born abroad	16%
	Speak Spanish at home	83%
	Location	68% in Madrid, 32% in Catalonia
	Free school meals	9%
	Type of school	27% state, 73% grant-assisted
	Failed one or more subjects in the first evaluation of 2020/21	78%
	Repeated a school year at least once	27%
	Did not attend online classes betwen March and June 2020	16%

B. ATTENDANCE OF TUTORING SESSIONS AND ABSENTEEISM

Figure 3. Attendance to tutoring sessions (minutes)

In percentage (%)



Despite the challenge of connectivity and the non-face-to-face nature of the programme, attendance was very high for most pupils. The aim of the intervention was for each pupil to attend 24 tutoring sessions of 50 minutes each (1200 minutes in total). We know that one of the major challenges in this type of programme is continuity and ensuring regular attendance. As a programme that ran online after school hours, this challenge was even greater. Figure 3 shows the total attendance distribution in minutes of the 206 participants. On average, the pupils received 17 tutoring sessions (70.8% of the total) and 920 minutes (76.7% of the total). Only seven pupils (3.4%) dropped out before starting and never logged on, the remaining 96.6% completed the programme until the end. These attendance rates and drop-out rates for the programme are slightly better those achieved for a similar programme introduced in Italy in April 2020 (Carlana and La Ferrara, 2021).

C. ACADEMIC RESULTS

End-of-year grades in mathematics and subject passes. We find a positive and significant effect of the *Menttores* programme on end-of-year grades in mathematics. The group of pupils who received tutoring improved their grades by 17% compared to the control group. On average, pupils in the intervention group scored about one point higher in the final maths grade than pupils in the control group, increasing from a 5.1 to almost a 6 (out of 10). This is a major effect compared to the evidence and corresponds to an increase by 49% of a standard deviation, which is equivalent to six months of learning in school. We also found a positive and significant increase in **the probability of passing mathematics:** Students in the treatment group were 30% more likely than those in the control group to pass the subject (a difference of 20.6 percentage points between control and intervention groups).

Results in standardised mathematics tests. Using the standardised test administered to pupils before and after the programme and designed based on the official mathematics curriculum for each of the two years (first and second year of secondary school), we find a 17% increase in the test score for the group of pupils who participated in the programme compared to the control group. This is equivalent to an effect of 26% of a standard deviation, or three months of learning.

Grade repetition. In addition, we find a large, negative, and significant impact on grade repetition: the programme reduced the probability of grade repetition by 9 percentage points. This equates to a **75% reduction in the probability of repeating the school year,** when compared to the control group's average repetition rate of 11.8%.

D. ASPIRATIONAL AND SOCIO-EMOTIONAL RESULTS

Satisfaction with school and aspirations to continue studying. In terms of results related to the socio-emotional development of pupils, we find an increase of 6.6% (corresponding to 22% of a standard deviation) in self-reported satisfaction with their school, measured on a scale from 1 to 7. Pupils who participated in the programme are also 13 percentage points more likely to say that they would like to study for the baccalaureate after compulsory education, an increase of 31% compared to the average of the control group. In contrast, we do not find an effect on the propensity of pupils wanting to go to university, probably because this decision lies too far in the future.

We found improvements in terms of self-reported effort at school. Pupils in the intervention group are 19% more likely than the control group to report that they try hard at school 'most of the time' or 'always'.

Contrary to expectations, we observed an increase in 'external locus of control'. Locus of control is a term that refers to the pupils' perception of who is responsible for the events in their lives. Tutoring usually tends to increase pupil's awareness and the perception that they can control what happens in their lives. However, we find that pupils who participated in the programme report more strongly

(17% of one standard deviation on the external locus of control index) that what happens to them is due to external factors. The results are mainly driven by the question 'When bad things happen to me, it is usually the fault of others', in which an affirmative response was 15 percentage points more likely than in the control group. One possible explanation, which needs further analysis, is that pupils may have interpreted the question in terms of self-blame for bad things that happen to them in life, and that the programme may have encouraged a reduction in self-blame.

Other social-emotional dimensions. We found no impact of the programme on pupils' likelihood to say that they think they are good at mathematics, or the propensity to say that they like mathematics. Nor did we find an effect on metrics of tenacity and perseverance (grit).

Table 3 and Figure 4 below summarise the results in the academic and socio-emotional and aspirational dimensions.

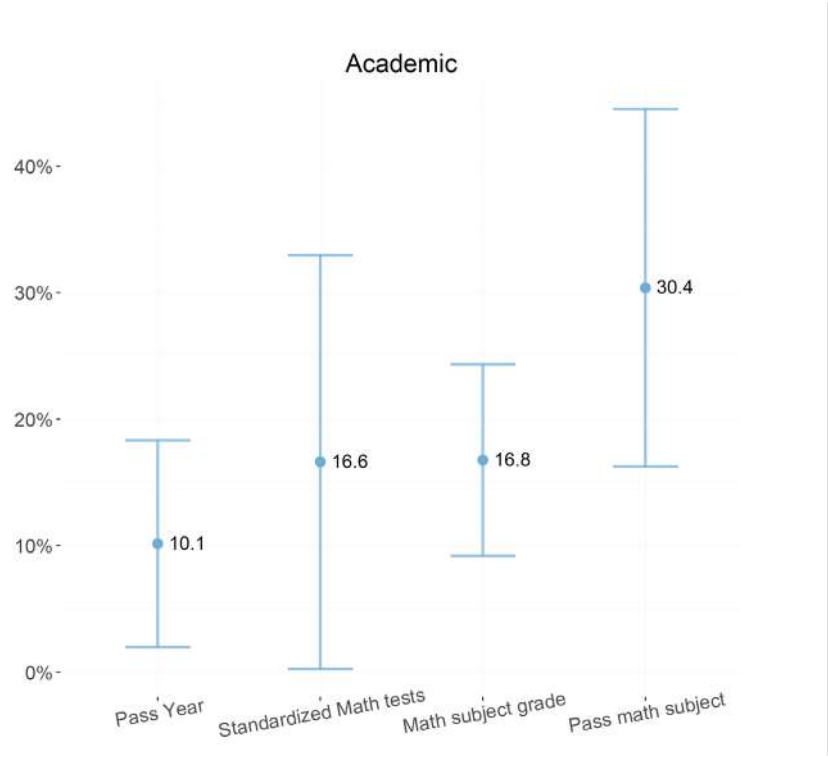
Table 3. Summary of academic and socio-emotional results

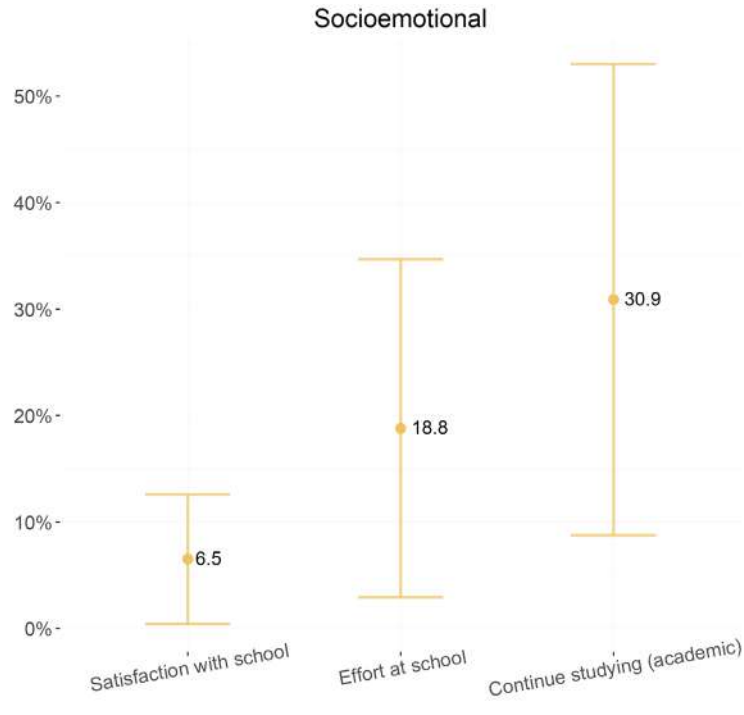
Dimension	Metric	Result
Academic	Final grade in mathematics (from 0 to 10)	**17%*** increase** (0.49 standard deviations), equivalent to six months of learning.
	Passing mathematics	**30%*** more likely.**
	Maths standardised test score (from 0 to 100)	**17%* increase** (0.26 standard deviations), equivalent to three months of learning.
	Grade repetition	Reduction of grade repetition by **8.9** percentage points or 75%** compared to the control group.
Socio-emotional / aspirational	Aspirations to continue studying at baccalaureate level	Increase of 13 percentage points, equivalent to a **31%** increase** over the control group.
	Satisfaction with school (scale 1-7)	Increase of **6.6%*** over the control group (0.22 standard deviations).
	Effort at school	Increased likelihood **(+19%*)** of reporting that they regularly, or always, try hard at school.
	External locus of control	Increase **0.17* standard deviations** in the external locus of control index.

Note: The table shows the main results. Statistical significance levels of effects: *** 1%, ** 5%, * 10%.

Figure 4. Results of *Menttores*

Improvement of intervention group versus control group (in %)





The X axis shows the different outcome variables of interest. Y axis displays the percentage of improvement of the group participating in the program with respect to the control group. The bars represent the limits of the 90% confidence intervals. If the lower bar is above 0, the effect is considered statistically significantly different from zero.

E. HETEROGENEITY OF RESULTS

To better understand how the programme affected participants, we explored various dimensions of heterogeneity.

1. Connection quality and device type

A good internet connection is key to the success of an online tutoring programme. Using data collected with the Google Workspace platform, we created an indicator of the average connection quality.[2] The impact of the programme on the maths test score is unaffected by connection quality. In contrast, if we consider the final maths grade and the probability of passing the subject, the positive effect is concentrated in pupils who experienced good connection quality (85% of participants). We also observe that pupils who experienced poor connectivity attended fewer sessions and received on average 250 minutes less tutoring than pupils who had good connections (who received 951 minutes on average). These results suggest that good internet connectivity is crucial for this type of programme.

We find no differences in the impact of the programme according to the type of device used to connect to the sessions (computer or tablet). The perceived advantage of tablets is that they have a touch screen, which may help the learning experience. However, this aspect did not seem relevant for the impact of the programme.

2. Pupil characteristics

The effect of the programme seems to have been slightly bigger for boys than for girls, although the increase in standardised test scores was similar between both groups. However, the effects are greater for boys on increased satisfaction with school, increased likelihood of passing mathematics, and likelihood of wanting to study for the baccalaureate in the future, although none of these differences are statistically significant.

We observe that the effects of the programme on the improvement of the standardised test score are concentrated around second-year pupils. On measures of satisfaction with life and school, the effects are also greater – by three to four times – for second-year pupils (and statistically significantly different from the results for first-year pupils). We are analysing the factors that might explain this heterogeneity with the aim of addressing them in more detail in a future academic paper. We did not find such differences for academic results measured only at the end of the programme (final grade or passing the subject).

2 We use ping time to measure connection quality. This a diagnostic indicator that reflects the time it takes for the local computer to communicate with the server. We classify a connection as 'bad' if on average the learner experiences a ping time equal to or greater than 100 (in milliseconds), and as 'good' if on average the learner experiences a ping of less than 100.



Pupils with foreign parents experienced similar effects to pupils with Spanish parents. This was especially true for the metrics measured at the beginning and end of the programme (standardised test score, satisfaction with school and life well-being index). **However, we observed greater effects for pupils with foreign-born parents on the final mathematics grade and the probability of passing the subject.** In contrast, pupils with Spanish parents were more likely to want to study for the **baccalaureate.**

The effects were also similar between children from households with at most a primary level of education, except for the increase in well-being and the likelihood of wanting to go on to study for the baccalaureate, where the effects were larger for pupils with more educated parents. We found no significant differences in the size of the effect between pupils from households earning more than €1000 per month compared to those earning less this sum. We did observe that both the effect on the standardised test score and the probability of passing the subject and wanting to study for the baccalaureate in the future were higher among pupils from single-parent families. Although these differences are not statistically significant, the differences in the coefficients suggest that in a larger study they would have been significant.

3. Characteristics of mentors

As pupils were randomly assigned to mentors, we can assess whether the impact of the programme varies depending on whether the mentor was a volunteer or qualified to teach mathematics (via a master's degree). The number of volunteer mentors is small (only 19 pupils were mentored by volunteers), and we do not have the statistical power to detect small differences in effects. However, effect sizes were significantly larger for 'professional' mentors on almost all outcomes (academic and socio-emotional).

We found a greater programme effect on standardised test scores for male mentors than for female mentors (almost three times higher). However, we did not find this gender difference in the final maths grade or the probability of passing the subject. In fact, the reduction in the probability of repeating a year was slightly greater for children assigned to female mentors, and the increase in the probability of wanting to study for the baccalaureate was concentrated only in children with female mentors.

F. OTHER RESULTS

In addition to the above results, qualitative surveys were conducted with families, mentors, headteachers, and maths teachers. The main results, presented in Figure A. 1 in the Annex, are described below.

1. Family evaluations

In the final surveys of the families of the pupils participating in the programme, we found a general satisfaction with *Menttores*. More than 80% of the families agree or strongly agree with the statement 'My mentored child is more confident in the subject of mathematics'. Some 80% of the families agree or strongly agree with the statement: 'Tutoring has improved my child's results in mathematics at school'. Finally, 85% of the families agree or strongly agree with the statement: 'The mathematics reinforcement programme has been useful for my child'.

2. Evaluation by *Menttores*

From the final mentor survey data, mentors were satisfied with the training received. When asked about the training and support received before and during the programme, 89% of the mentors agreed or strongly agreed that the training plan was useful. Some 89% also agreed or strongly agreed that the training on the platform was adequate and sufficient. Some 68% agreed or strongly agreed that the webinars were useful and sufficient. Moreover, 86% of mentors consider the combination of online training and webinars to be adequate.



The mentors were also satisfied with the course of the programme. The mentors answered several questions about their satisfaction with the project. Some 82% agree or strongly agree that participating in the project has helped them better understand the social reality facing mentees. Some 95.4% of the mentors agree or strongly agree that the programme has enriched them personally and professionally, while 98% enjoyed supporting and accompanying the mentees. In terms of the future, they are also optimistic about themselves and the programme itself: 88.6% agree or strongly agree that they now have more tools for their professional future in education, and 89% agree or strongly agree that *Menttores* is an initiative with greater potential for supporting vulnerable pupils than other programmes. Finally, 95% agree or strongly agree that a programme like *Menttores* should be accessible and universal for all pupils in need, and 91% say that if there were more programmes, they would repeat the experience of tutoring pupils from difficult backgrounds.

3. Evaluation of mathematics teachers and headteachers

Mathematics teachers and headteachers of the participating schools rated the impact of the programme positively. Annex Figure shows the results of the final survey of the mathematics teachers teaching in schools whose pupils participated in the programme. More than 70% of the teachers and 57% of the headteachers surveyed agree or strongly agree that the programme has been useful for their pupils. Some 69% of the teachers believe that the programme is a good support for their teaching. Finally, 71% think that the programme should continue, which is also shared by 100% of the headteachers surveyed. Finally, 40% of mathematics teachers believe that the fact that pupils participated in the programme helped them to work better, and another 42% believe that the coordination meetings with the mentors were useful: some teachers said that they were overwhelmed by the workload during the programme, which might explain the lower proportion of positive responses. Finally, in the open-ended responses, several teachers and headteachers mentioned the need to start these programmes before April and make them longer.

'For our school and the type of pupils we have, one of the most important aspects is that the programme is free of charge. I am sure this is why many families have been able to access this help.'

Headteacher

'The follow-up work by the mentors has been very positive: the weekly continuity of the meetings and the empathy of some of the mentees with their mentors, made them see what the mentees are capable of achieving. Congratulations to the mentors and to the creators of the programme.'

School mathematics teacher

5 | Making small group tutoring programs a public policy in Spain

The cost of inaction in the long term is far greater than the cost of the short-term investment needed to mitigate learning loss. As the Covid-19 pandemic in developed countries draws to a close, it is time to consider what has happened for a whole generation of learners, and time to consider the long-term effects so that action can be taken. Eric Hanushek and Ludger Woessman (2020) have estimated that the cost of long-term learning loss in developed countries could be a drop in future GDP of about 1.5% per year in the long run. With such figures, any investment to recoup the 2020 and 2021 learning loss will be tiny, and therefore highly cost-effective.

To catch up with learning loss, several neighbouring countries have announced unprecedented investments in catch up interventions. For several months, there has been an intense debate in the field of education policy on how to tackle learning loss. International organisations, research centres, and policymakers emphasise, in a majority and comprehensive manner, the need for multimillion euro investment programmes to face the greatest educational emergency seen this century (Crenna-Jennings et al., 2021). Perhaps the most ambitious example is that of the Netherlands, which in February 2021 announced a package of €8.5 billion over three years (around €1,000 per pupil per year) in a national education programme aimed at all types of educational interventions and projects in a progressive approach (the greater the disadvantage, the greater the funding), with a strong emphasis on reinforcement measures (such as individualised tutoring, extra-curricular activities, more teachers and specialised staff, and summer reinforcement). The United States has announced €123 billion for 2021 (about €2,000 per pupil) to reopen schools and mitigate the effects of the pandemic on learning, through personalised tutoring, summer schools, and psycho-social support for pupils. The United Kingdom has invested €3 billion, via the National Tutoring Programme, mainly in personalised tutoring for those pupils most affected by the pandemic.

In Spain, the government responded effectively to keep schools open during 2020/21, but funds that have been set aside to recover the learning losses after the pandemic are comparatively low. During the 2020/21 academic year, the government increased investment by €2 billion to ensure face-to-face attendance with smaller class sizes: the first of the needs. As the 2020/21 academic year has ended with relative success, it is urgently necessary to launch an investment programme that matches the scale of the problem. In the Spanish Government's 'Recovery, Transformation, and Resilience Plan', component 21 includes the activation of a Programme of Reinforcement, Orientation, and Support (PROA+), an updated version of the extra-curricular reinforcement programme that existed between 2006 and 2012 and had positive impacts (García-Perez et al., 2017). PROA+ will be developed between 2021 and 2023 for schools serving the most vulnerable pupils, but unfortunately, investment is only €120 million per year (about €15 per pupil in total per year, €60 per pupil if dedicated to the 25% most disadvantaged), an insufficient amount and far from that of countries that are making this a priority public policy.

To recover the loss of learning and loss of socio-emotional well-being among pupils, we consider it necessary to launch a PROA+ of at least €3.6 billion over the next three academic years (€1.2 billion per year). The central government should, together with the regional governments, **multiply by ten** the investments made in the PROA+ programme to reach the three million pupils who have been most affected by the consequences of the pandemic. This would mean an annual investment of €450 per pupil in educational reinforcement, which would make it possible to combine out-of-school reinforcement, personalised tutoring in small groups, and an ambitious summer reinforcement programme (an initiative that has a huge potential impact for the most vulnerable pupils).

The growing educational inequality generated outside school via private tutoring is set to grow in the coming years. This inequality is primarily a state failure, as the absence of public after-school or remedial services means that a large private sector is more likely to develop. The growth of online tutoring has skyrocketed during the pandemic and will continue to expand after the pandemic following an exponential rise in the technological private sector: some estimates suggest a growth of 8.4% per year (GIA, 2021) over the next five years globally. But this growth will be driven primarily by the increasing demand for these services from middle- and high-income families, who are showing that they are willing to increase educational investment to support their children. Governments around the world can respond to this dynamic by providing structural tutoring and remedial programmes that reach all pupils and thereby limit these dynamics.

***Menttores* shows the enormous potential of individualised tutoring in Spain.** *Menttores* is a project that shows how the best scientific knowledge, experimentation, and innovation are put at the service of educational equity. Our project responds to the challenges of the past (year repetition and structural early dropout), the present (learning loss caused by the pandemic), and the future (ever greater inequality of access to opportunities) of the socially disadvantaged and left-behind pupils in Spain.

Few investments are as socially and economically profitable as *Menttores*. For example, year repetition in Spain accounts for between €1.4 and €1.7 billion of public spending every year.[3] If we extrapolate the results of *Menttores*, only in terms of success in reducing grade repetition (by 75%), the government could save around €1.2 billion per year; the same as the cost of the educational support plan, we propose here. In addition to these savings, there would be considerable improvements in individual well-being, higher educational attainment of pupils who avoid repeating their school years (since repetition and early school leaving are related), better social cohesion, and greater economic growth.

3 In Spain, about 70,000 pupils repeat the year at primary level (2.4% of a total of 2.85 million pupils) and about 177,000 pupils repeat at secondary level (8.7% of a total of 2.04 million pupils). Repetition represents an average cost of between €6,000 and €7,000 per pupil (repeaters are concentrated in secondary school and in state schools, where expenditure per pupil is higher) and reaches a total of between €1.5 and €1.7 billion. Source: MEFP (2021).

The online format of *Menttores* provides solutions to these challenges in an innovative, inclusive, and rigorous approach. We offer a specific pathway that can be scaled up to hundreds of thousands of learners. The main contribution of our programme is that it demonstrates that online tutoring in small groups works and achieves good results that are like those obtained in face-to-face tutoring. This enables designing programmes to reduce the educational gaps that have been worsened by Covid-19 and are more affordable than face-to-face programmes. Technology also opens the possibility of designing fairer programmes: a pupil anywhere in Spain can access the best mentor.

Given the overwhelming evidence available, such policies should go beyond being a pandemic response. We strongly believe that individualised tutoring programmes should become part of the core menu of structural education policies in every nation that is concerned with education and equal opportunities. We also believe that at a time when large amounts of public resources are being committed, priority should be given to investments that are accompanied by rigorous prior evaluation, and to scaling up projects that really work. Given the results obtained by the *Menttores* programme, any educational response plan to Covid-19 should include individualised, small group tutoring plans.



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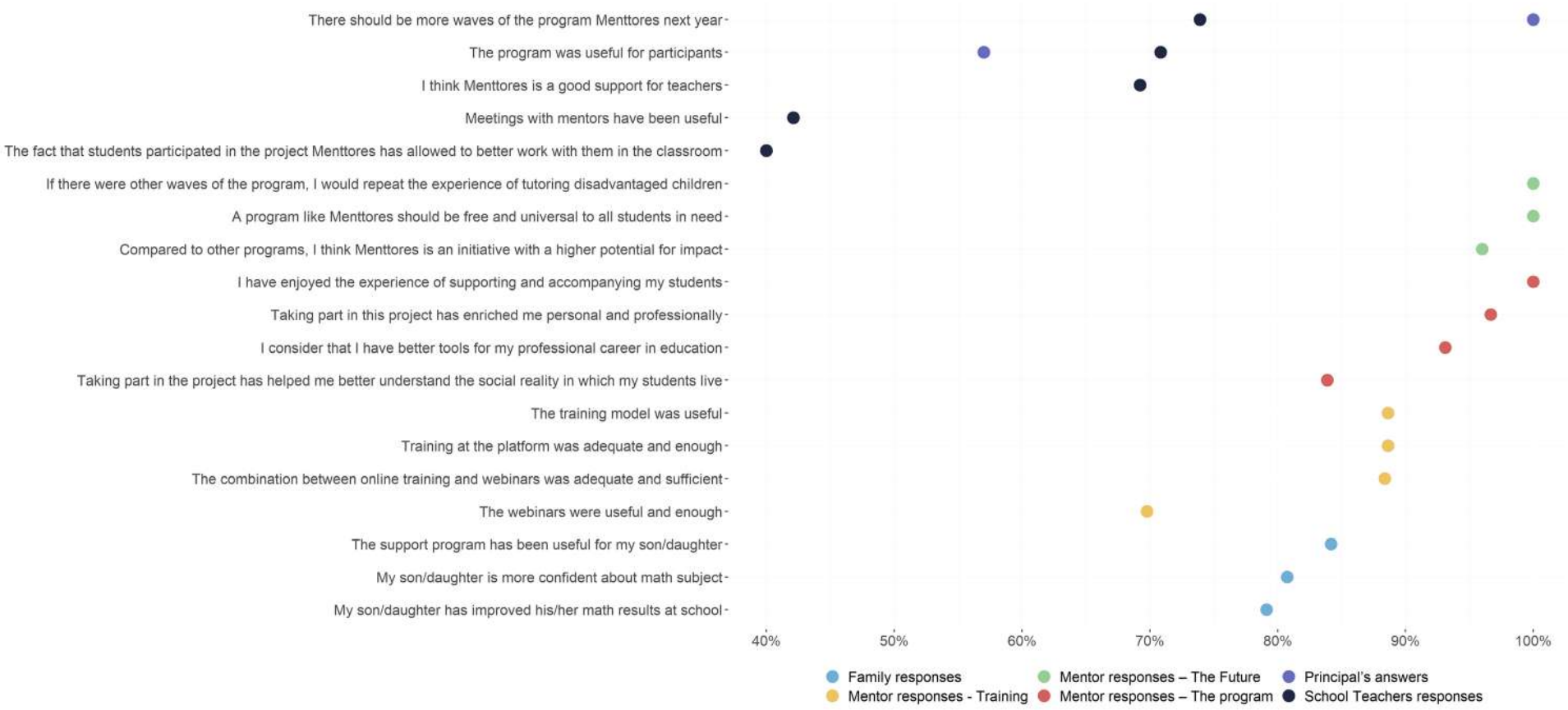
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6 | Annex

Figure. Valuations about *Menttores* of families, mentors and school principals/teachers

Percentage (%) which agree or fully agree with the following statements



mentores