

Does Higher Parental Involvement Lead to Learning Gains? Experimental Evidence from Indonesia

**Florischa Ayu Tresnatri, Asep Kurniawan,
Daniel Suryadarma, Shintia Revina, and
Niken Rarasati**

Abstract

We study how information delivered by teachers to parents on students' learning progress and guidelines for active involvement in children's education can improve learning outcomes. We conducted a randomized control trial experiment in 130 primary schools in Kebumen District, Central Java, Indonesia. The implementation of the intervention collided with the school closures due to the COVID-19 pandemic, adding to the significance of this intervention to help parents in undertaking learning from home. We find that the intervention increased parental involvement at home and communication with teachers. The information also improved parental demand to teachers which increased teachers' motivation and support in students' learning. However, the positive impacts on parents and teachers did not translate into improved student numeracy test scores. Further investigation revealed that parents' low capability to teach their children and the lack of right support given by teachers to students during learning from home hindered the impact on learning outcomes.

Keywords: education; randomization; information; parental involvement; learning outcomes; Indonesia



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Florischa Ayu Tresnatri
SMERU Research Institute

Asep Kurniawan
SMERU Research Institute

Daniel Suryadarma
Asian Development Bank Institute

Shintia Revina
SMERU Research Institute

Niken Rarasati
SMERU Research Institute

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1. Introduction

Information is necessary to establish coherent accountability relationships among actors in the education system (Pritchett, 2015). On a similar note, global reviews of education interventions claim that providing information to parents is one of the most cost-effective ways to improve learning outcomes (Angrist et al., 2020b; World Bank, 2020). The kinds of information delivered to parents include a student's individual learning outcomes (e.g., Afridi et al., 2020), average school performance (e.g., Andrabi et al., 2017), returns to education (e.g., Jensen, 2010), and ways to support children at home (e.g., Barrera-Osorio et al., 2021). To generate gains in learning outcomes, the information must be specific, relevant, and come from a trusted source (World Bank, 2020).

In the literature, virtually all information interventions in developing countries involve external actors, whether a non-governmental organisation or a research team, exerting a large amount of effort and resources to compile the information.¹ Often, the information is delivered outside regular channels, such as through specifically organised meetings (e.g., Andrabi et al., 2017), text messages (e.g., Berlinski et al., 2021), or facilitation (e.g., Di Maro et al., 2020). Yet despite these efforts expended to create and deliver the information, the majority of information treatments result in zero or only modest impacts on learning outcomes.² This shows that high quality information is insufficient. Kosec and Wantchekon (2020) added two conditions: the recipients must have the agency and the incentive to act on it. In incoherent education systems, in which parents are largely bystanders in the learning process (for example Lieberman et al., 2014; Pradhan et al., 2014), these conditions are rarely met.

In this study, we partner with the Government of Kebumen, a district in Indonesia, to design and pilot an intervention to increase parental involvement. The main questions we address are whether an education system could improve parental involvement using existing resources and capabilities, and whether higher parental involvement could lead to learning gains. The focus on parental involvement was the result of a series of in-depth diagnostics on binding constraints in Kebumen's education system and discussions about potential solutions that are within the capability of the education office and school personnel to implement.

Having identified sustainability and potential for scale up as central concerns, we departed from the high-cost and externally-driven approach that the majority of studies in the literature took. Instead, we purposefully relied on the current education system and personnel capabilities to gather and deliver the information. We co-designed the intervention with staff from the local education office and tailored it to the specific context in the area. After several iterations, we settled on an intervention that consists of three components.

First, the education office asked teachers to write a monthly learning progress letter on each child and deliver it to parents. To support teachers in implementing this letter, we created a form that significantly reduced the time needed by teachers to write the letter but ensured that it still

¹ The information on student performance, for example, often required the implementation of a special learning assessment. Packaging the information in ways that can be understood by parents also required specific efforts.

² Based on a review of nineteen studies that provide information to parents, teachers, and/or other education stakeholders, published between 2008 and 2020.

contained relatively detailed information on each student. To promote our theme of focusing on learning progress rather than scores, teachers were not asked to score the students.

The second and third components were aimed at increasing parent agency and incentive to be more involved in their children's education. We created an opportunity for parents to respond to the letter by providing a "response section" in the learning progress letter, which the parents could return to the teachers. Finally, we designed informational leaflets that the education agency then delivered monthly to every parent in the treatment schools. The content of the leaflet includes, for example, how parents could support children's learning from home, how to communicate with teachers, and how to focus on learning progress rather than on final exam scores. These leaflets were created through a consultative process with parents and teachers. Since we relied on existing school personnel and government processes to implement the intervention, the total direct implementation cost was less than 1 USD per student over the course of 14 months. Overall, these components can be categorized as a set of low touch interventions. But in our context, and, we argue, in the context of developing countries more generally, low touch interventions are the most feasible, affordable, and likely to be scaled up and become sustainable. In contrast, many information production and delivery mechanisms tested in previous studies are high cost and unlikely to be sustainable for education systems in developing countries.

We piloted the intervention in an experimental setting that covers 65 treatment and 65 control schools, involving more than 500 teachers, 5,000 students, and their parents. We find that parents not only spent more time with their children at home, but also engaged more with the teachers and invested more in education. Overall, parents increased engagement with their children at home by 0.18 standard deviations. Our index that measures conducive environment for studying at home is higher by 0.21 standard deviations in the treatment schools. Parents increased the intensity of their communication with teachers by 0.14 standard deviations. Finally, the proportion of students in the treatment group who are enrolled in extra tutoring outside school is higher by 24%. These results imply that the intervention was successful in increasing parent agency and incentive.

We also find that teachers in treatment schools reported higher motivation by 0.2 standard deviations. They also reported 29% higher awareness of their students' learning progress. The index of teacher support to students increased by 0.31 standard deviations. On the part of the student, we find a small but statistically significant impact on their study behaviour at home, mainly through a better adherence to their study schedule. Despite all the positive impacts above, we find no impact on students' mathematics skills. Since our experiment is powered to detect an impact above 0.18 standard deviations, we can rule out the conclusion that the intervention has a meaningful impact.

Our results provide insights into the potential of using existing education system capabilities to improve parental involvement through a contextually specific, low cost, and low touch set of interventions. Existing education personnel and government processes delivered the interventions. Overall, our results are encouraging. Achieving significant gains in parent involvement with their children's education is possible even in a system that is used to largely ignoring parents. However, our study indicates that expecting higher learning outcomes may be a step too far.

The pilot was implemented during the period when schools were closed due to the COVID-19 pandemic, and children underwent distance learning. At this time, parents had to take up more responsibilities for their children's education. Therefore, our study contributes to the literature on supporting children during school closures, such as through text messages or phone-based

instructions (Angrist et al., 2020a; Hassan et al., 2021). Specifically, we estimate whether providing information to parents is sufficient to attenuate the learning impacts of the pandemic. Our results corroborate the findings of Hassan et al. (2021), who conclude that providing interventions to low capability parents may not be sufficient to support their children's learning at home. However, Lim et al. (forthcoming) find that high capability parents are able to provide individually-tailored teaching at the right level at home, thus improving their children's learning levels beyond the counterfactual of going to school in the pre-pandemic period.

We organize the rest of the paper as follows. The next section provides more context of the area that we worked in. We discuss the set of interventions in greater detail in Section 3. Sections 4 and 5 present the data and empirical strategy. Section 6 discusses the findings. We provide some conclusions in Section 7.

2. Context

Kebumen district covers an area of 1,281.115 km² in a mountainous and coastal area in the southern part of central Java. It is consistently ranked among the poorest districts in central Java, with around 18% of its population living in poverty (BPS Provinsi Jawa Tengah, 2021). Despite its high poverty level, Kebumen managed to obtain a relatively middling school attainment level. On average, adult education attainment in Kebumen is 7.54 years (Dinas Pendidikan Kabupaten Kebumen, 2020) slightly lower than national average but a solid achievement compared to its economic conditions. Not only focusing on increasing participation in schooling, the Kebumen government also established several policies that focus on enhancing quality education, such as a comprehensive teaching and learning training program, cultivating students' talent and interests, and school management training. They spent 18.5% of the educational budget on improving teacher quality and education services (Dinas Pendidikan Kabupaten Kebumen, 2020). Kebumen was one of the top 100 most improved districts based on its 9th grade UN (National Examination) score. In 2017, the average National Examination (UN) score for 9th-grade students in the District of Kebumen was slightly higher than the national average: 55.53 and 49.64, respectively. This placed Kebumen in the 12th place among 29 districts in Central Java (Pusat Penilaian Pendidikan Kemdikbud, 2018).

To improve parent participation in increasing quality of learning, Kebumen also diligently implemented ministers' instruction (Kementerian Pendidikan dan Kebudayaan, 2017) that parent associations (*Paguyuban*) should be involved to support communication between homeroom teachers and parents. Many events were held to increase the participation of *Paguyuban*, such as classroom decoration competitions, picnics, mini school gardens, etc. However, our diagnostic study showed almost no activity or interaction among parents in *Paguyuban* that is directly related to student learning issues. They actively help schools by repairing broken furniture, painting classrooms, and planting trees in the school garden. In fact, a meta-analysis conducted by Castro et al. (2015) shows that such involvement has very little to no effect on academic achievement. To be impactful, parents need to communicate about school matters daily with their children, read together with them, and accompany them during their study time at home.

We conducted a qualitative diagnostic study to understand the root cause of parent low involvement in student learning activities, which in turn limits students' academic improvement. The study found that parents understand that they need to support and involve in their children's education. However, they don't have the agency to take initiative to be involved in learning matters. Parents from low socio-economic background are not confident in talking to teachers

about school subjects due to their low educational background. They also think that because of their educational background, they would not give any added value, so they prefer to give this responsibility to teachers who are more educated than them. Moreover, information sent by the schools was usually limited to required additional funding for construction or maintenance of school infrastructure or special events held by the schools. Parents responded to this information really well. Struggling with their economic condition, parents were also hesitant to encourage their children to do well in school as they think they could not afford their children's higher education. Middle-income parents also experienced difficulties in educating their children at home. They were struggling in teaching discipline to their children. Those children are addicted to electronic gadgets, and parents have no idea how to handle them.

To tackle those issues, Kebumen Government decided to implement an intervention that aimed to increase parental involvement in helping their children learn. The intervention was implemented during the school closure period due to the COVID-19 pandemic. Our intervention schools were spread across mountainous and coastal areas with poor internet coverage. With limited access to gadgets and internet access, the interaction between students and teachers during school closure declined substantially. About 30.3% of our respondents had less than one to no direct interaction with their teachers per week. Teachers only sent a set of assignments that should be sent to the schools weekly or biweekly. Only 18.87% of students experienced routine interaction with their teacher for five to six days per week. And 72% of those who interacted directly with teachers daily only spent less than two hours learning with their teachers. Most of the interactions (89%) also only occurred through group chat. Learning from home in Kebumen is far from ideal. Parental involvement became more necessary to ensure that children could still learn at home.

3. Intervention, Research Design, and Conceptual Framework

3.1. The Intervention

The particular intervention that we study, the Parental Involvement Improvement program, is a low-touch information-based intervention that seeks to promote parental involvement in the improvement of children's learning in Kebumen district. From our diagnostic study, we found that low parental involvement resulted in limited room for learning outcome improvement in Kebumen. This low parental involvement occurred because parents did not receive much information related to child's learning from school and did not know ways to be actively involved in child's education due to their low confidence and education attainment. Building up from our diagnostics, the intervention attempts to address the causes for low parental involvement in Kebumen. Hence, the intervention involves a series of informational treatments that provide parents with feedback about their children's performance and guidelines for actions to be involved in a child's education. Our study does this in two linked activities: First, by providing parents with information about their children's learning progress; and second, by providing concrete suggestions about steps that parents might take to be actively involved in a child's education.

On the information delivery method, we considered the government's existing business processes. We purposefully avoided creating a new delivery mechanism, which would require additional resources and reduce scalability. The information on students' learning progress was conveyed to parents through learning progress letters that were specifically tailored by the teacher to each student. The letters contained sections on learning materials that the child had learnt last month but still struggled to comprehend, next month's study plan for the whole class, a special note from teacher to parent (for noting about misbehavior, homework, etc.), and a section asking

the response from each parent about the parent's action plan after reading the given information. On the other hand, the information on concrete suggestions about the steps that should be undertaken to improve parental involvement was given in a colored and illustrated leaflet. The content of the leaflets ranged from information on the benefits acquired by children due to high parental involvement, ways to accompany child studying, creating a conducive study environment, reading together with the child, asking and listening to the child's story about school, motivating the child's learning, communicating with the teacher and other parents, disciplining the child, and becoming a role model for the child. Through our instrument pilot, these themes were considered to be important by Kebumen parents as those activities were important for their children's education and yet were rarely done by parents at that time. The details of the letter and leaflets can be seen in the Appendix A1 and Appendix A2.

We collaborated with the District's Education Agency in designing and implementing the program. The Education Agency funded and distributed the letters and leaflets to the school principals and teachers. The teachers of each classroom wrote the learning progress letters and further distributed the letters and leaflets to parents. School closures shifted the distribution mechanism of our letters and leaflets from in-class distribution to a rotational pick up to schools by a student class leader or a representative from the parents' group. After receiving the letters and leaflets, parents were required to write their action plan on the specified section of the learning progress letter, then return it back to the teacher through a student class leader or a representative from the parents' group who picked the sheets to the houses and then dropped them at school. The teachers subsequently submitted the parental response sheets to the Education Agency, allowing us to monitor monthly parental responses during the program implementation.

Prior to implementing the intervention, we obtained an ethical clearance to implement the intervention and collect endline data from a reputable university in Jakarta that handles research ethics approval nationwide. The Kebumen district government and education agency, schools, and teachers (in both treatment and control group) were also well informed about the study and fully supported the randomized evaluation approach.³

The intervention was implemented from February 2020 until April 2021 by disseminating students' learning progress letters and leaflets to all Grade 1-6 parents in each month, except for the semester breaks in June, July, and December 2020. In total, parents received both the letters and leaflets 12 times, with a relatively low cost incurred per student: 0.92 USD across all disbursements. The implementation of the intervention happened to collide with the school closures due to the COVID-19 pandemic. We did not anticipate this to happen in the first place, hence our intervention was not designed to address the learning loss stemming from the school closures. However, the district's government heavily relied on this program to aid parents in undertaking learning from home during the pandemic.

3.2. Research Design

Our research exploits a randomized control trial in estimating the impact of the intervention on parental involvement for children's education and on student's learning outcomes. A pair matching clustered randomization was used to assign the treatment status. Each stratum comprises a pair of sub-districts matched based on sub-district characteristics with regards to health and education

³ Upon completion of this study, we are discussing with the Kebumen Education Agency about the possibility of scaling up the intervention to all primary schools in the district, including the control schools.

facilities, topography, access to state electricity, and health and education programs. In each stratum, one sub-district was randomly assigned to be the treatment sub-district while the other as the control sub-district. As a result, half of the 26 sub-districts in Kebumen were randomly assigned into the treatment group, while the remaining 13 sub-districts served as the control group as in Figure 1. The randomization was clustered at the sub-district level to avoid the risk of spillover generated due to the regular meetings conducted by the school principal and teacher working groups within the same sub-district, and school supervisor that can potentially relay information to other school principals in the same sub-district.

To achieve the 80 percent power and a minimum detectable effect of 0.18 standard deviations, the study encompasses 126 primary schools, equally divided between treatment and control groups, resulting in 63 public primary schools per group. We rounded up the number of schools to be 65 in each group, such that five primary schools were randomly sampled in each sub-district. As a result, the intervention was rolled out into 65 public primary schools across 13 treatment sub-districts, while other 65 schools in the remaining 13 sub-districts served as the control group. In addition, the minimum number of students required to achieve an MDE of 0.18 standard deviation with 80 percent power is 6,880 students. The parents of all students in the treatment schools were the beneficiaries of the program who received the letters and leaflets.

3.3. Conceptual Framework and Measures

Parents may not be able to fully engage with their children's education due to information asymmetry between school and parents (Barrera-Osorio et al., 2021; Dizon-Ross, 2019; Rogers and Feller, 2018) and low literacy and numeracy skills, particularly for low-income parents (Mani et al., 2013). The letters and leaflets in our study are aimed at overcoming these psychological and informational barriers that often impede school-and-parent relations. This is also the case with parents in Kebumen in which the teacher and classroom parental associations often tend to marginalize parents that have no communication gadgets, patchy internet access, and low social initiative. This makes it difficult for the less advantaged parents to take an active role in their children's education. The printed form of information in letters and leaflets aims to accommodate the less advantaged parents into the information loop and enhance communication with the teacher.

The theory of change consists of several mechanisms that underlie how the intervention would affect student learning outcomes. The first step is for parents to feel confident in their own ability to support their child's learning after reading and understanding the letter and leaflet. Parents would also increase their awareness regarding their child's learning progress and might adjust their beliefs on their children's academic ability.

The next step is an increase in parental direct support at home. Parents have more information about their child's performance in school and information that guides them in accompanying their child's study, which allows them to adjust how they support their children at home. We examine parental direct support at home as an index normalized to the control group constructed from seven measures using the Principal Component Analysis (PCA): days per week parents accompanied their child in studying, days per week parents helped the child with homework, days per week parents asked and listened to the child about school/learning, days per week parents read books together with the child, whether parents created the study schedule with the child, whether parents frequently acted assertive to make the child obeyed the study schedule, and whether parents ensured the child finished school work.

Increased parental support should lead to a more conducive study environment at home, which is measured as an index constructed by PCA using variables of: whether parents turned the television off during study time, whether parents provided sufficient lighting for studying, whether parents put gadget away from the child unless for searching learning related materials, whether parents were not using gadgets while the child was studying, whether parents and other household members did not speak out loud when the child was studying, whether parents provided the child with a study desk, and asked the child's friend to go home during study time.

The letter and leaflet should trigger communication between parents and school as measured by communication intensity among parents and between parents and the teacher. Improved communication between parents and the teacher was due to parents asking the teacher about the child's learning progress or discussing further about the content of the leaflets. Additionally, the learning progress letter of their child would inform parents about their child's academic progress thus making it possible for parents to make demands of teachers for their child's learning improvement. Discussion with other parents should also be fostered as they might discuss and share about the letters and leaflets.

Increases in parental demand and communication with teacher would mean greater oversight over teachers in how they manage their teaching process. Teachers may be induced to become more motivated and feel accountable given that parents are regularly communicating and making demands of the teacher. We measure teachers' motivation by constructing an index with the Item Response Theory Rating Scale Models (IRT RSM) method using 12 variables that represent teaching efficacy resulted from shared collaboration and communication with parents. Specifically, we asked teachers to rate along four scales for the following questions: a) To what extent parents motivate teacher to work hard, b) To what extent communication with parents helps in educating the child collaboratively, c) How often parents remind teacher if something is wrong or should be improved, d) How parents' care for the child affects the teacher to pay attention to the child's learning, e) How hampered the teacher is if parents cannot guide the child in studying, f) How capable parents in the class are to help the child in studying, g) How active parents in communicating within Parent Association Classroom Group (*Paguyuban*), h) How confident parents are that they can motivate their child, i) To what extent parents believe that their child can get good academics, j) How often parents give up when the child is hard to study, k) How hard it was for the teacher to help parents in guiding the child's studies at home, and l) How hard it was for teacher to collaborate with parents in handling the child's behavior.

We used IRT RSM instead of PCA to construct the teacher's motivation index as IRT RSM calculates items that represent the highest motivation (which are only chosen by people with high motivation) with heavy weight. On the other hand, PCA calculates items that are frequently chosen with heavy weight. Therefore, IRT RSM is considered as a better method to better capture the variation of motivation, thus was used for constructing the motivation index.

Writing the learning progress letter tailored to each student would also allow teachers to better be aware of each student's specific needs. Higher awareness of students' learning progress combined with increased motivation would encourage teachers to exert greater support for students. We measure teachers' support for students as an index from PCA of eight survey items: live-teaching duration (hours per week), checking and correcting students' assignments (hours per week), whether teacher gave textbook to students at home, hold extra tutorials / consultation (hours per week), whether teacher returned assignments/feedback to parents monthly, whether the teacher provided enhancements to support the learning of high performing students, whether the teacher provided remedials to support the learning of low performing students, and whether the teacher accepted parents' advice and improve teaching and support towards students.

Improved parental support and learning environment at home combined with improved teacher support should induce greater student learning behavior. A student learning behavior index is constructed through PCA by using measures of hours per week the child studied and/or did homework, hours per day the child read non-academic books, and whether the child always obeyed study schedule.

The last step in the theory of change is the improvements in educational outcomes. Improved student learning behavior is expected to improve learning outcomes. To measure learning outcome, the standardized score from remote student learning assessment in Mathematics was used.⁴

4. Data

The data for this study comes from four sources: quantitative and qualitative endline surveys for parents and teachers in grade 3-6 as well as the school principals of the 130 primary schools, the remote student learning assessment in mathematics, and the parental responses obtained from the monthly response sheets. A baseline survey was not conducted in this study due to resource constraints. As randomization was used to assign treatment, thus the potential for bias to occur due to the differences in characteristics between the treatment and control groups is unlikely.

The endline surveys were conducted in two phases. The first one was the quantitative endline survey conducted in May 2021 until July 2021 aimed to gather information about outcomes and covariates of interest. The interviews were conducted by phone due to the COVID-19 pandemic that precluded in-person meetings. All school principals of the 130 primary schools were interviewed to obtain data on school characteristics and learning from home school policies. One homeroom teacher in each of the Grade 3 to 6 classes was interviewed to obtain data regarding the remote teaching and learning practices in the first semester of 2021. If a grade level had more than one classroom, one classroom was randomly selected to be interviewed. Ten parents were randomly selected from each sampled classroom to be interviewed and asked regarding household characteristics, learning from home practices, their student's learning behavior at home, communication pattern with the school, perception about the child's academic ability, and parental involvement at home during the first semester of 2021. In total, there were 7,235 parents and 508 teachers of Grade 3-6 that were interviewed from the 130 treatment and control schools.

During the same period, a remote student learning assessment (SLA) was administered for Grade 3-6 students from the treatment and control schools. The remote SLA was designated to adapt to the pandemic situation that made it impossible to conduct on the spot classical tests in class.⁵ The remote SLA was accessed by students through a website link sent to their parent's WhatsApp. The questions in the remote SLA were given randomly between students and were made adaptive such that the following questions differ between students as they depend on each student's answer to the previous question. This is designed to prevent cheating between students who could have shared the screen shots of questions and answers through social media. The

⁴ The remote student learning assessment was adapted from the standardized student learning assessment developed by Rarasati et al. (2020) which is used for in-person tests in classroom. In addition, the remote SLA was only tested for the numeracy as the development for remote literacy learning assessment was still being undergone.

⁵ The inability to conduct face-to-face individual assessment to Grade 1 and 2 students due to the pandemic also limits our data by excluding the lower grade students. The reason is that most of the Grade 1 and 2 students are still not able to read and operate the remote SLA without the help of their parents.

remote SLA was used to measure a student's learning outcome in math. The student's assessment score data was merged with the parental and teacher endline surveys to investigate the relation between parental involvement and teacher support with learning outcomes.

As not all interviewed parents' children did the remote SLA due to unresponsiveness while there were non-interviewed parents' children who did complete the remote SLA, the data for the remote SLA comprises 6,936 Grade 3-6 students. For the students with limited access to internet, the school principals rotationally gathered a group of students at school so that they could access the internet connection available from the school's WiFi to complete the remote SLA.

The second phase of the endline survey was the qualitative in-depth phone-based interviews in October 2021. The qualitative survey was conducted to determine the underlying explanations for the findings of the quantitative survey. In the parents' interview, questions were distributed across several topics. These include the forms of involvement that increase upon receiving posters and learning progress letters (for the treatment group), the extent to which parents are involved in their child education, the sustainability of parents' involvement throughout the school year, and parents' awareness about their child's learning progress. In the teacher interview, the questions included the following topics: benefits for teachers from writing up the monthly learning progress letters (for the treatment group), forms and frequency of communication with parents, and support provided for individual students.

In addition to the endline survey data, the monthly parental responses obtained from the intervention monitoring process was used to delineate the trends of proportion for different types of parental involvement undergone from February 2020 until April 2021. In total, the data for the trend analysis contains responses from 7,542 parents of the Grade 3-6 students from the 65 treatment schools. The trend analysis used the responses of 'panel' parents: parents who always submitted the response sheet every month from the beginning until the end. This comprises 1,793 parents (23.8 percent).

4.1. Balance Test

To test for the balance between the treatment and control groups, we used the time invariant variables obtained from the quantitative endline surveys. As shown in Table 1, the balance test was done at the school (Panel A), teacher (Panel B), and household (Panel C) levels. At the school level, school facilities index was constructed using the PCA method. The school facilities for the index include the availability of a library, sport field, sport tools, health clinic unit, canteen, hall, science lab, computer lab, language lab, internet connection, prayer room, toilet, cooperation room, practice room, school principal room, teachers' room, computer in the classroom, and projector in the classroom. At the household level, the asset index was constructed as a proxy for the household's wealth using the PCA method. The asset index comprises the household's possession of a house, land, unsubsidized gas tube, refrigerator, motorcycle, car, television, radio, jewelry or gold bar, computer or laptop, air conditioner, water heater, cable telephone, mobile phone, tablet, electronic games gadget, washing machine, cow or buffalo, and chicken, bird, and other poultry.

To determine parental abilities to read, write, and calculate, parents were asked a few questions. First, parents were asked whether they can read a newspaper and write a letter. In addition, parents were asked one math question such as, $3 \times 4 + 5 - 2$, to gather data on their ability to calculate basic math operations.

From the three panels, the differences in the mean values between the treatment and control groups are statistically insignificant across all covariates. This implies that the treatment group is not statistically different from the control group, thus any differences in outcomes are likely due to the intervention itself.

5. Empirical Strategy

5.1. Quantitative Analysis

We estimate a series of empirical models which provide a set of causal estimates of the effect of providing parents with information on their children's learning progress and guidelines to act on a series of outcomes. For our main analysis, we estimate the impact of the information provision to parents on student learning outcomes. The model is specified as follow:

$$Y_{ij} = \alpha + \beta * T_j + \theta_k + \varepsilon_{ij} \quad (1)$$

where Y_{ij} is the numeracy remote learning assessment score for student i in school j , T_j is a binary variable (1 if school j was a treatment school and 0 otherwise), and θ_k is the strata fixed effects. β is the impact of the intervention and we estimate robust standard errors clustered at the sub-district level. The sub-district clustered standard errors are used as it is important to account for uneven effects of the intervention within the treatment clusters.

In addition to estimating the learning outcomes, we also estimated other mediating outcomes for student's learning behavior and parental involvement at the student level. As our theory of change predicts that the impact of information provision to parents on student learning outcomes is also mediated through teachers, we also estimated the outcomes at the teachers' level. The model specifications are identical to Equation (1), only with different outcome variables for Y_{ij} that are the indexes and comprising variables according to our theory of change. Each of the indexes related to parental involvement, student's learning behavior, and teacher's behavior serves as the outcome variable that is regressed on Equation 1. Additionally, each of the variables that constitutes an index serves as the outcome variable which is also regressed on Equation 1.

To test for the robustness of the estimates, we conducted the randomization inference and multiple hypothesis testing procedures.

We employed randomization inference with 1000 replications to the estimation of the primary and intermediate outcomes. We used sub-districts as the clusters and the pairs of matched sub-districts as strata, following our randomization assignment procedures. Randomization inference considers what would have occurred under not only the random assignment that happened to be selected for the experiment, but rather under all possible random assignments (Heß, 2017). The result would show whether the previous inferences still hold, especially for the stratified and clustered randomization where the p-value of the estimates tend to increase and alter the statistical significance of the estimates. We reported the p-values resulted from the randomization inference to examine the robustness of the Ordinary Least Square (OLS) estimates.

In addition, multiple hypothesis testing serves as the second way for testing the robustness of the estimates. The large number of measured outcomes raises concerns about multiple inference, that is, significant coefficients may emerge simply by chance, even if there are no treatment effects (Anderson, 2008). Thus, it is important to test for multiple hypothesis involving the measured outcomes in parental involvement, teacher behavior, and students' learning behavior. We controlled the false discovery rate (FDR) or the proportion of rejections that are 'false discoveries' (type I errors). FDR control is well suited as it allows a small number of type I errors in exchange for greater power. To do the test, we saved the p-values of all outcome estimates in each of parental involvement, teaching behavior, and student learning behavior impact evaluation. As there is only one outcome in evaluating the impact on student learning outcome, hence multiple hypothesis testing was not conducted for this aspect. The FDR procedure resulted in the adjusted p-values in the form of sharpened q-values. We reported the sharpened q-values to examine the robustness of the OLS estimates.

To examine the extent to which there are heterogeneous impacts based on several characteristics, we estimate a model of the following form that includes an interaction between the treatment status and heterogeneity characteristic:

$$Y_{ij} = \alpha + \beta * T_j + \delta * T_j * H_i + \eta * H_i + \theta_k + \varepsilon_{ij} \quad (2)$$

Variable H_i is the heterogeneous characteristic that is analyzed. The heterogeneous characteristics that are analyzed for the impact on students' learning outcomes include: an indicator for whether the student is a male, the family is rich, the parent has a university degree, the teacher is a male, the teacher is a civil servant, and the child's school's regional standardized test score is above the average. Additionally, we also estimated impact heterogeneity for parental involvement based on parental education and family's wealth. The impact heterogeneity for teachers' behavior was also estimated based on the teacher's gender and civil servant status. For our heterogeneity analysis, β represents the treatment impact on the opposite value of the H_i variable, while δ represents the impact difference between the two values of H_i . For example, if H_i represents family is rich, then β indicates the treatment impact on poor families, whereas $\beta + \delta$ indicates the treatment impact on rich families.

5.2. Qualitative Analysis

A qualitative study was conducted following the results of our quantitative survey. The aim was to explain the quantitative findings about the relation between parental involvement and a child's learning outcomes. Specifically, we would like to seek explanations about the channels that explain the relationship between parental involvement, teacher support and children's learning. We conducted multiple interviews with parents and teachers from both treatment and control schools. In each group, we purposefully included parents with high involvement but a child with below-average learning outcomes and parents with low involvement but a child with above-average learning outcomes. Besides, we interviewed teachers with high support but students whose learning was below average, in both groups. This was to allow us to gain more understanding about the lack of treatment effect as indicated by the quantitative results. In total, we conducted 8 interviews with parents in the treatment group, 8 interviews with parents in the

control group, 6 interviews with teachers in the treatment group, and 6 interviews with teachers in the control group.

6. Results and Discussion

6.1. Implementation of the Intervention

Before turning to the impacts of the intervention, we begin by examining the implementation of the interventions. The intervention was rolled out to all Grade 1 to 6 parents and teachers in the 65 treatment schools. From the submission of the parental response sheets, we obtained an illustration of the extent to which our intervention was received by the parents across the twelve months of the intervention implementation (Figure 2). From Figure 2, we can see that during the pandemic time, on average, 73% of the Grade 1-6 parents submitted the response sheet to the teachers in each month. Meanwhile, 68% of the parents wrote meaningful content on the response sheet in each month. The below 80% figures were mostly due to the distance learning that limited the delivery of the instruments to parents and the submission of the parental response sheets to teachers.

In addition, from the sample of the Grade 3-6 parents in 65 treatment schools in our endline survey, 84% of the parents received the learning progress letters and leaflets. Moreover, 92% of the parents claimed that they gained new knowledge about parenting by reading the leaflets. Meanwhile, 95% of the parents acknowledged that they obtained new information on their child's learning progress due to the letters, and 50% of the parents felt motivated to teach their child after knowing the learning materials that their child was still struggling on. Examining the potential for the sustainability of this intervention, 94% of the parents claimed that they wanted this program to be continued in the next coming years.

From the teacher's side (i.e., Grade 3-6 teachers in the 65 treatment schools), only 16% of the teachers considered that writing the learning progress letters increased their burden, while the majority of the teachers did not feel burdened by this task. In addition, 95% of the teachers admitted that they were reminded by the school principal to begin writing the learning progress letters in each month. This implied that the intervention relied on school principal reprimanding the teachers to write the letters. Lastly, the majority of the teachers (86%) would like to see the continuation of this program in the next few years.

From the endline survey, we also found that there was no spillover that occurred as the school principals, teachers, and parents in the control schools had never heard of or received the intervention.

Acknowledging that not all parents received the intervention in the 65 treatment schools, thus the impacts that we will estimate are the intent-to-treat estimates. The ITT estimates measure the effect of being assigned to the treatment condition, in which parents were assigned to receive the information.

6.2. Impact on the Accuracy of Parental Beliefs on Child's Achievement

We first examine whether parents' beliefs about their child's math performance appeared to be affected by the receipt of information one year after receiving the learning progress letter. We asked parents to state the score they expected their children to receive on the remote numeracy student learning assessment. We then compared the stated scores by parents with the actual test score that the child obtained from the numeracy remote learning assessment.

From Figure 3, there appears to be no evidence that the beliefs of parents in the treated schools differed from those of parents in control schools. In other words, there is no improvement in parents' awareness of their child's learning progress. Both parents in the treatment and control groups overestimate a low performing child's numeracy capability, while they underestimate a high performing child's numeracy capability. This null impact on the accuracy of parental beliefs may be largely caused due to the learning from home, which gave both the treatment and control parents the opportunity to directly observe their child's learning progress at home.

6.3. Impact on Parental Involvement

The impacts of the intervention on a range of parental involvement outcomes are shown in Table 2. The treatment has a significant impact on parental direct support for child's education at home by 0.18 standard deviation. The significant impact on direct support at home specifically includes higher days per week on which parents were helping their child with homework and reading books together with their child. Parents in the treatment group were also 11.1 percentage points more likely to create study schedule for their child and 11.76 percentage points more likely to act assertive to make their child obey the study schedule, relative to the control group.

Parents in the treatment group also put more effort into creating a conducive environment for their child's study, greater by 0.21 standard deviation relative to the control group. Those parents were 14.3 percentage points more likely to turn off the television during study time, 1.83 percentage points more likely to not use gadgets when the child was studying, 5.94 percentage points more likely to not speak out loud with other family members when child was studying, 4.3 percentage points more likely to provide a study desk for the child, and 2 percentage points more likely to ask the child's friend to go back home during study time.

The intervention also fostered more communication between parents and school. The difference was 0.14 standard deviation higher for parents in the treatment group. Parents in the treatment group were 6.12 percentage points more likely to frequently contact the teacher to discuss their child's learning progress. It also appears that the intervention successfully encouraged parents to frequently make demands or give advice to the teacher by 2.6 percentage points. However, the proportion of treatment parents who actually made demands of the teacher was low, only about 11 percent. In addition to fostering communication with teachers, the intervention also increased frequent communication between parents in the Parent Association Classroom Group (*Paguyuban*) by 5.1 percentage points.

Lastly, it also seems that receiving the information, parents were 3.2 percentage points more likely to expend financial investment through registering the child in outside of school private tutoring.

To test for the robustness of the estimates, randomization inferences and multiple hypothesis testing of the impact on parental involvement dimensions were conducted in the Appendix, Table

A1. The table shows relatively consistent statistical significance of the estimates across the OLS, randomization inference, and multiple hypothesis testing methods. This indicates that the results are fairly robust.

A question may arise regarding the possibility of over-reporting the outcomes during the parental endline survey, as treatment parents have known about the activities from the leaflets. There are two main points to justify that over self-reporting should not be a concern. First, parents were asked with objective and numerical type of questions, for example, how many days per week, and hours per day. This makes both parents in the treatment and control groups to answer factually from the number that they had actually encountered. In addition, the outcomes with yes or no values were actually coded from open-ended questions. Thus, parents mentioned the specific outcomes without being led by the surveyors.

Additionally, the parental response analysis obtained from the monitoring sheets of the Grade 3-6 'panel' parents (in **Figure 4**) showed that parental involvement has emerged and been sustained in a positive trend since the beginning of the intervention, up until the end of the intervention. Nevertheless, there is a downward slump in the proportion of parents who provided action or support for their child's learning in Month 8 and 9. This was due to the content of the leaflets in the two months that encouraged parents to foster communication with teachers and other parents. As a result, due to such content, parental responses in Month 8 and 9 mostly voiced their discussion and communication with teachers and parents. Despite the significant impact of the intervention on parental demand to teachers, it turned out that there was a relatively small proportion of parents who made demands of teachers, with a declining trend over time. Nevertheless, parents in the treatment group became more confident of their ability to help with their child's studies, as can be seen from the small number of parents who felt incapable of helping their child.

Our heterogeneity analysis further examines how the impact of the intervention on parental involvement is distributed across different levels of parental education and family's wealth (Table 3).

Overall, the intervention generated impacts on both parents with high education level (i.e., minimum senior high school education level) and low education level (i.e., below senior high school education level), although several variables resulted in null impact on one of the parental education categories.⁶ Higher impacts of direct support index and most of its constituent variables are observed amongst parents with high education level. Specifically, parents with high education level exhibited a higher frequency of helping child with homework, asking and listening to the child about school or learning activities, reading books together with the child, and acting assertive to make the child obey the study schedule. The intervention also resulted in parents with high education level frequently turning the television off, not using gadgets while the child was studying, providing the child with study desk, communicating with teachers to talk about learning progress, and registering child in outside of school private tutoring. Nevertheless, higher impacts were observed for parents with a low education level regarding creating a study schedule with child, providing a conducive environment for studying, not talking out loud when the child was studying, asking the child's friend to go home during study time, giving demands to teacher,

⁶ Senior high school is used as a threshold for defining educational attainment as only less than 5 percent of the Kebumen parents in our survey who possess diploma or university degree.

communicating with parents in *paguyuban*, and making monthly educational expenditures for child.

The intervention also seemed to be able to improve the parental engagement of poor families. This is supported by the evidence of higher treatment impacts on poor families regarding direct support provision, helping the child with homework, creating a study schedule with child, acting assertive to make the child obey the study schedule, providing a conducive environment for studying, turning the television off when the child was studying, not speaking out loud during the child's study time, providing the child with study desk, asking the child's friend to go home during study time, communicating with parents in *paguyuban*, and registering the child in outside of school private tutoring⁷. Nevertheless, there are also a range of outcomes with higher treatment impact obtained amongst the wealthy families, namely, reading books together with child, not using gadget and speaking out loud while child was studying, communicating with teacher regarding learning progress, and giving advice to teacher.

6.4. Impact on Teaching Behaviors

The treatment generated impacts on a range of outcomes for teachers in Table 4. First, writing the learning progress letters allowed teachers in the treatment group to become more aware of their students' learning progress by 16.8 percentage points. Their awareness was represented by providing parents with information regarding their children's strengths, weaknesses, and ways to improve children's academic performance.

The communication and collaboration between parents and teachers in educating the children resulted in improved teacher's motivation and sense of collective efficacy in teaching. The impact was 0.2 standard deviation relative to the control group. The increase in motivation and greater parental demand in turn improved teachers' support for students by 0.31 standard deviation. Specifically, teachers in the treatment group were 5.95 percentage points more likely to give a textbook to students at home, gave consultations or extra tutorial sessions in a longer duration per week, 9 percentage points more likely to return assignments or feedback to parents a few times in each month, 10 percentage points more likely to provide remedial help for low performing students, and 12.6 percentage points more likely to accept parents' advice and improve teaching and support towards students.

Nevertheless, we see significantly shorter hours per week of live teaching for teachers in the treatment group. Further exploration reveals that the shorter hours were due to the high infection rate of COVID-19 in the treatment sub-districts. Internet availability was not significantly different between the treatment and control groups, yet both groups were equipped with patchy internet connection. Therefore, higher infection rates meant that teachers in the treatment group were blocked from visiting the students' house to conduct live teaching during the school closures. Meanwhile, control group teachers were more frequent in conducting live teaching at students' houses.

⁷ Private tutoring outside of school in Kebumen is relatively cheap, with prices ranging from USD 0 (provided by volunteers from local universities) to USD 5 per month, thus making it affordable for the poor families.

Similar to the parental survey, the objective and numerical type of questions, as well as the open-ended questions were used to address the concern of social desirability bias due to over self-reporting from the treatment teachers.

To test for the robustness of the estimates, randomization inferences and multiple hypothesis testing of the impact on teacher dimensions were conducted in the Appendix, Table A2. The table shows relatively consistent statistical significance of the estimates across the OLS, randomization inference, and multiple hypothesis testing methods. This indicates that the results are fairly robust.

Our heterogeneity analysis further examines how the impact of the intervention on teaching behavior is distributed across different teacher's gender and civil servant status (Table 5).

Higher impacts of teachers' motivation and support for individual student index are observed amongst female teachers. Specifically, female teachers exhibited higher motivation due to collaboration with parents, provision of textbooks to students at home, extra tutorials or consultation sessions for students, returned feedback for student's assignments to parents, provision of remedials to support low performing students, and acceptance of parents' advice related to teaching improvement. Nevertheless, higher impact was observed for male teachers regarding awareness of student's learning progress.

The intervention also seemed to generate higher impact towards civil servant teachers. Specifically, civil servant teachers exerted higher motivation in teaching and collaborating with parents and higher support for individual students (e.g., giving textbooks to students at home, holding extra tutorials / consultation, returning assignments / feedback to parents, providing enhancement to support high performing students, providing remedials to support low performing students, and accepting parents' advice for learning). Nevertheless, higher treatment impact amongst non-civil servant teachers was observed pertaining to awareness towards student's learning progress.

6.5. Impact on Student's Learning Behavior and Learning Outcomes

We first examine the impact of the intervention on student's learning behavior at home, as can be seen in Table 6. The intervention caused a modest increase of student learning behavior index by 0.094 standard deviation. This increase in learning behavior was mostly due to the increase in the child's obedience towards the study schedule at home by 3.8 percentage points. However, despite such an increase, the amount of students in the treatment group who always obeyed the learning schedule was low, only 18.6 percent.

To test for the robustness of the estimates, randomization inferences and multiple hypothesis testing of the impact on student learning behavior dimensions were conducted in the Appendix, Table A3. The table shows relatively consistent statistical significance of the estimates across the OLS, randomization inference, and multiple hypothesis testing methods. This indicates that the results are fairly robust.

Nevertheless, despite the positive impact of the intervention on parental involvement, teachers' behavior, and students' learning behavior, there is no evidence of improved student learning outcomes in numeracy. There was a small 0.03 standard deviation increase in numeracy test score (Table 7), yet it is far below the minimum detectable effect of 0.18 standard deviation. Thus, it is not enough to be translated into a significant improvement in numeracy learning outcome.

Randomization inference in the Appendix, Table A4 also shows null impact, indicating that the result is robust.

A heterogeneity analysis on the learning outcome (Table 8) further indicated that the intervention generated higher impact on numeracy test scores for students whose parents have high education level (i.e., at least senior secondary school level) and whose teacher is non-civil servant. Nevertheless, the intervention did not generate impact across other heterogeneous variables in Table 8.

6.6. Understanding the Lack of Treatment Effect

The fact that our quantitative results show an insignificant effect of the intervention towards student's learning outcome despite the increase in parental involvement and teacher's support may be explained by the combination of our qualitative findings described below.

Despite the increase in parental involvement, parents were not well capacitated to fully become “a teacher” for their child during the learning from home

Due to parents' low educational attainment, parents have limited capability to comprehend their child's learning materials and to apply the right or the same teaching method as what the teacher does. This made parents less capable in teaching their child effectively during learning from home. Perpetuated by the fact that teachers only gave instructions on which pages on the textbook to read and do, without an explanation of the subject on those pages, this made it harder for children to understand the learning materials, although a conducive learning environment was established by parents. However, despite the difficulty that parents encountered in guiding their children and in the absence of proper teaching from teachers, parents tended to be reluctant to ask the teacher about how to teach the subject to their children. One parent from the treatment group with high involvement but their child's learning outcome below average said, *"I'm afraid to be judged fussy if I ask too many questions [to teacher]. So, it is up to the teacher how to teach my child."* (Parents, Treatment Group, 5 October 2021).

In addition, parents' focus was mainly on the on-time submission of a given assignment to teachers, not their child's mastery of the concepts covered in the task. Parents admitted that they did not truly check their child's understanding on the subjects. As long as the tasks given by the teacher had been completed, parents thought their duty to assist child learning had been accomplished. One parent from the treatment group with high involvement but below-average child learning outcomes said:

"My child did the assignment from the teacher in the afternoon after he had been out playing since morning. Because the assignment had to be submitted promptly that afternoon, I helped him answered the questions with the best knowledge that I had. Whether he understood the subject or not, I do not know. The important thing is that the assignment was done and submitted on time." (Parents, Treatment Group, 3 October 2021)

Parents' assertiveness has not resulted in consistent adherence to the study schedule, while tended to make children lose their enthusiasm in learning due to the feeling of being forced to study

Regarding the sustainability of learning adherence to the study schedule, parents are not always able to consistently enforce the study hours to their child. During school from home, children

normally felt the need to study mainly when there were tasks sent by teachers. But teachers did not send tasks every day – most of the time only two times a week. Thus, only during this time would children voluntarily sit still and study. Most of the time of the day, children spent their time playing outside. One parent from the control group with high involvement but their child's learning outcome below average described, *"During study from home, my child tends to be lazy, unlike when studying at school. He thinks school closures are the same as holidays. He often sleeps late at night, so he wakes up late."* (Parents, Control Group, 4 October 2021).

As a consequence, parents admitted that many times when parents reminded the child to study according to the schedule, the child felt as if they were being forced to study. One parent from the treatment group with high involvement but their child's learning outcome below average shared an experience when her child held a textbook during the study time but only skimmed through it unenthusiastically. She doubted that her child would learn much from such activity, but she did not do anything about it. She said, *"I always supervise my child to make sure he was really doing his homework, especially math. But maybe because he felt forced, he tended to lose his enthusiasm for learning and did not do it earnestly. I often scold him for it."* (Parents, Control Group, 6 October 2021)

The increased supports given by teachers may not be the right type of supports that were actually needed by the students and parents in undergoing the learning from home

The teachers were struggling to conduct remote learning, particularly due to unbalanced access to internet and electronic gadget ownership amongst the students. As a result, it was hard for teachers to teach learning materials through online face-to-face teaching, which is in fact the thing that was actually needed by students. Most of the time, teachers only gave assignments to students, while relying on parents' ability to teach the learning materials to children. We found that both in the treatment and control groups, the live instructional time was low (i.e., 8 hours per week), with lower live instruction time in the treatment group by 2 hours during this remote learning. Thus, despite the increase in teachers' support across several dimensions, this may not be enough to support children's learning during school from home learning, thus not enough to improve students' learning outcome.

In addition, due to the remote learning and lack of offline and online face-to-face interaction and teaching, it was hard for teachers to observe students' learning progress. Teachers mostly only relied on the score of assignments to assess students' learning progress. However, there were indications that parents helped their children with homework. Specifically, students obtained high scores on tasks, while when checked directly through occasional visits to students' houses by asking the children to redo some questions, teachers often found students who got a high score in the tasks actually understand the concept poorly.

"I know parents help their children with homework. In fact, I know there are many [parents] that solve hard questions the child did not know how to answer. But that is okay because it is an emergency. The important thing is that the child continues to study at home, even though it is not optimal. I will only give notes or text to the parents if the condition is severe. For example, if students do not do anything at all, or the results of their homework are all wrong, or the results are too good even though I know their children are not capable. This means that all the questions are answered by parents." (Teacher, Treatment Group, 10 October 2021)

As a result, the assignment scores obtained by teachers did not reflect children's true learning progress. This inhibited teachers from giving parents accurate information regarding students' learning progress to parents, especially regarding the learning materials that the child still struggled with. The inaccuracy of the information contained in the learning progress letters may

be causing our learning progress letters to fail to improve the accuracy of parental awareness towards child's learning. Consequently, in the absence of proper information and guidance from the teachers, parents became more clueless in guiding and teaching their child in learning from home. This may in turn negated the positive impact that parental involvement had on students' learning outcomes.

7. Conclusion

Our intervention of providing parents with information about a child's learning progress and guidelines to act has proven to be effective in improving parental involvement for children's study at home as well as teachers' support. During the COVID-19 pandemic that has forced schools to shut and shifted learning from school to home, the role of parents in children's study has been even more substantial than ever and our low-cost intervention has aided parents in assisting their child's learning. However, the improved support from parents and teachers did not translate into an improved learning outcome.

This result echoes findings from previous studies that reported the improved parental involvement is not always translated into impact on learning outcome. Barrera-Osorio et al. (2021) and Avvisati et al. (2014) argued that this may be due to the fact that student's cognitive achievement is less easily altered than attitudes or behavior by an intervention.

Our follow-up in depth interviews revealed that parents have limited literacy and numeracy skills due to low educational attainment.⁸ This is also supported by the quantitative results that revealed significant impact on learning outcomes for students whose parents have high education level. The parents' low literacy and numeracy skills impeded the impact of improved parental involvement - which is rather superficial - on learning outcomes. In other words, the types of support provided by Kebumen parents to their children were not adequate to ensure these children experienced better learning activities. Besides, it is evident that parental literacy and numeracy skill hold an important role in children's learning outcome improvement, especially during the school closure where parents were required to act as teachers at home.

Furthermore, despite the evidence of improved support from teachers, these supports may not be the right type of aid that was needed by children and parents for learning from home to be effective. Particularly, the low level of live teaching instructions might have limited the learning improvements resulting from the increased parental investments. Limitation to disadvantaged parents and children in accessing communication devices and internet connection that supports learning also inhibited teachers from monitoring student's learning progress at home. Thus, it also limited teachers' ability to provide parents with accurate information and recommendations regarding student's learning progress. As a result, parents were not well informed on the aspects that their children needed to further develop, resulting in difficulties in improving learning for their child.

Relating further our findings with the system conditions required for an information intervention to succeed as stipulated by Kosec and Wantchekon (2020), it is implied that due to the poor quality

⁸ Although the Balance Test from Table 1 Panel C shows that about 90% of the parents can read, write, and calculate, these are relatively basic math. When parents were asked with more advanced math questions, they were very nervous and couldn't give any answers for a long time. The questions made them feel uncomfortable, so much that we eliminated such questions from the phone interview to avoid attrition.

of learning from home during the pandemic our intervention may have missed two out of the three requirements for successful information intervention on learning outcome. Information is only effective in the presence of three necessary conditions: the information must be **relevant** to the individual, the individual must have the **power** to act on it, and the individual must have the **incentive** to act on it.

'Relevance' examines whether parents get accurate information about the quality of education at their child's school. Our intervention may not provide relevance to parents as the remote learning made it hard for teachers to observe students' learning. Consequently, the learning progress letters which were provided to parents did not give accurate information on learning. This opens a possibility that our intervention might work in non-pandemic times. 'Power' examines whether parents have the authority to tell the school and teachers what they expect from their child's education. Our intervention has provided parents with the power to voice their thoughts to teachers through the learning progress letters. However, it comes back to the matter of 'Incentives': whether parents' action will affect the school and individual teachers' payoffs. This third condition may have failed to be met by our intervention, as the distance learning made it harder for parents to check on teachers. Different from the Pakistani context (Andrabi et al., 2017), the vast majority of primary schools in Indonesia are public, and their average quality is higher than private schools (Newhouse and Beegle, 2006). Therefore, parents in Kebumen did not have much choice of alternative schools to enroll their children in. This eliminates the penalty received by schools which might have motivated teachers and school principals to improve the learning quality if there was indeed a penalty.

Overall, the findings of this study provide policy implications such that a written informational programme may not be sufficient to nudge parents to provide impactful actions that lead to improvement of their child's learning outcomes, especially in a region with predominantly poor and low educated parents. Accordingly, our results pointed out the necessity of improving the parents' knowledge and skills before they could provide effective assistance to their children. List et al. (2021) and Bergman et al. (2018) found that the contexts where parental education is low often requires high touch interventions such as home visits and face to face regular meetings. However, the high touch interventions usually come with a really high cost and are often infeasible to be done sustainably by the government.

Angrist et al. (2020a) and Hassan et al. (2021) reported that interventions that improved learning outcomes amidst the school closure during the pandemic may be delivered through academic tutoring by volunteers to parents and children incorporating the use of phone calls in rural settings. More importantly, Hassan et al. (2021) find that the increased parental involvement only contributes to 14% of the learning gain, despite the intervention's large reliance on parents (through providing weekly time involvement, curriculum target, learning plans, solution keys, and answering any questions). Most gain is resulted from the tutoring volunteers channel. This calls for the involvement of outside parties to help parents in guiding their children learning from home, especially for the poor and low education attainment parents. Therefore, information provision treatments that rely on teachers as the source for providing information may not be effective during this pandemic time. This calls for action to improve teachers' capabilities in adapting and teaching remotely, as well as enhancing their capability to provide parents with guidance for undergoing the learning from home.

Our results raise questions as to whether policymakers should indeed invest in or rely on improving parental participation as a strategy to improve learning outcomes, especially if parents' low literacy and numeracy skills are a binding constraint. If the latter is the case, then it takes an agency or outside parties other than the formal education personnel to guide and deliver the

information to parents in order to generate substantial impact on learning outcomes. Alternatively, it requires strong support for teachers to be able to provide accurate and relevant information to parents. Otherwise, low literacy and numeracy skills will impede the impact that improved parental involvement has on student's learning outcomes.

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Figures and Tables

Figure 1 Treatment Assignment at the Sub-District Level

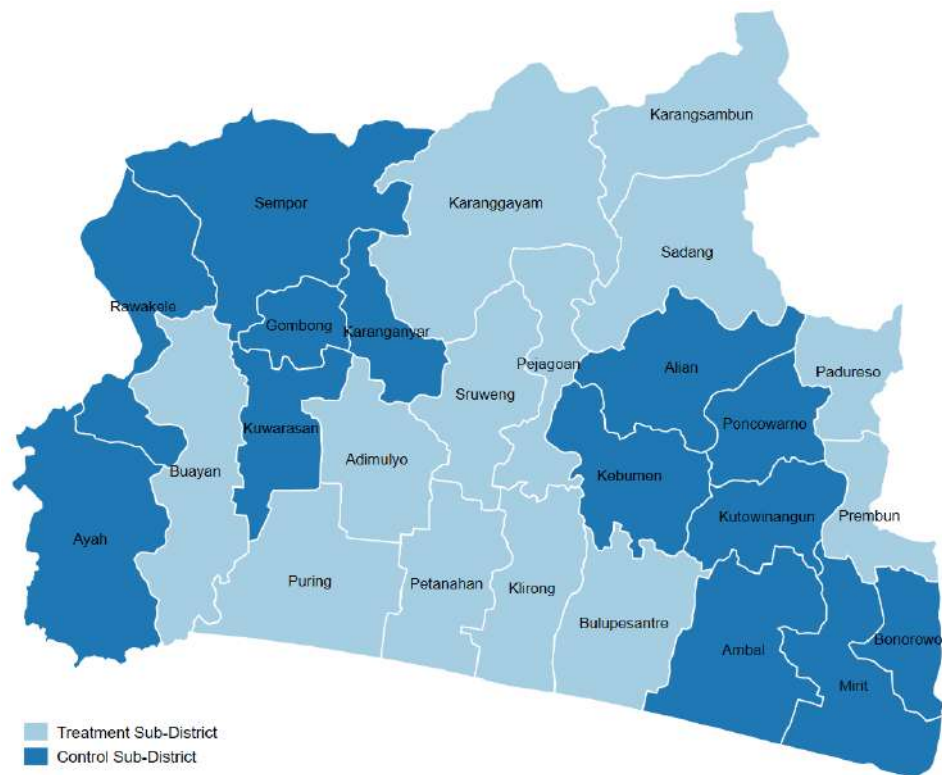


Figure 2 Response Rate of the Parental Response Sheet

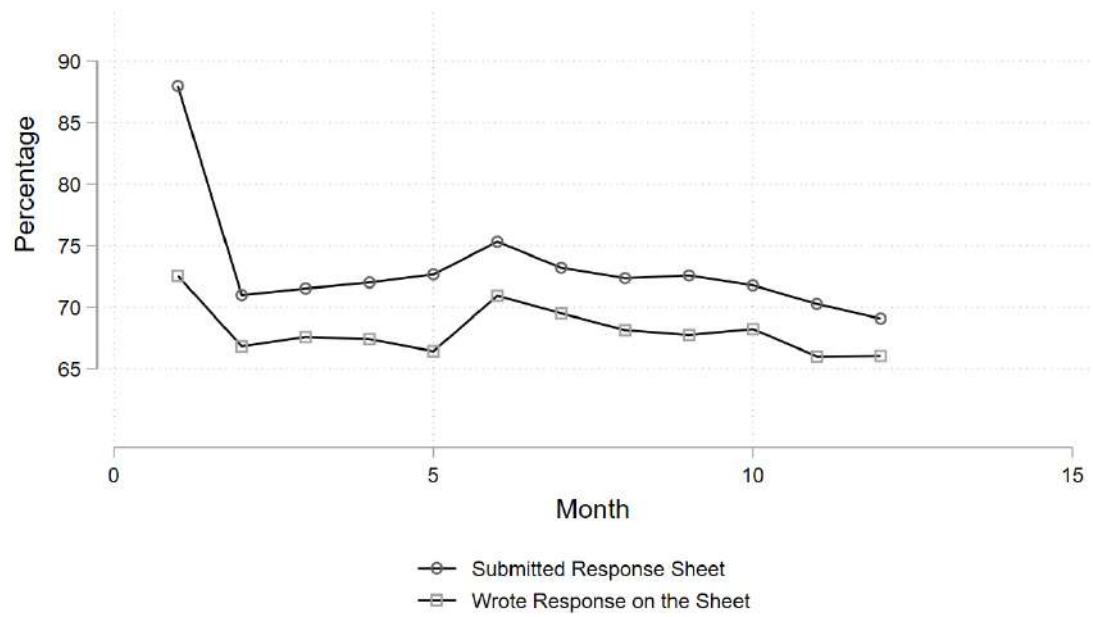


Figure 3 Parental Perception on Child’s Math Performance vs Child’s Actual Performance

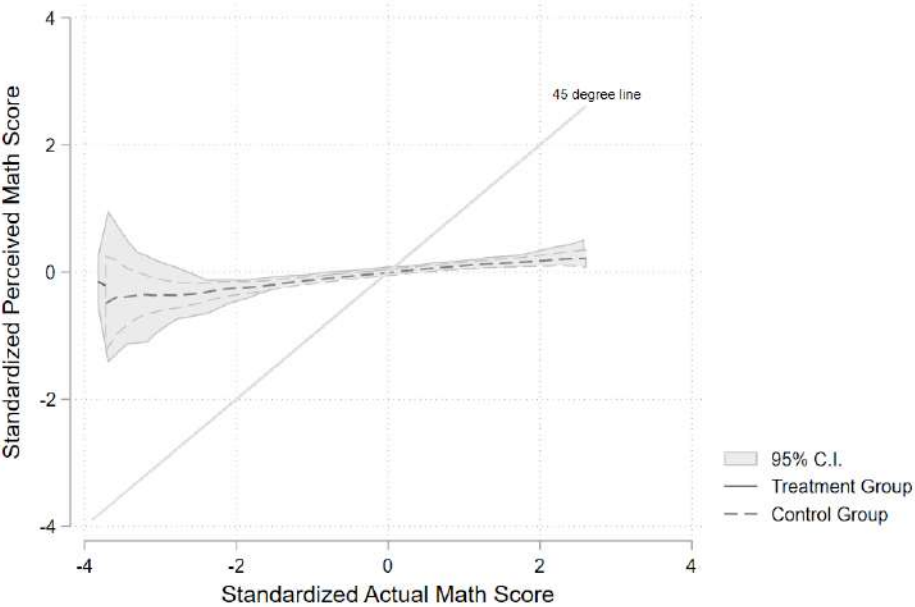


Figure 4 Parents' Action after Reading Letters and Posters

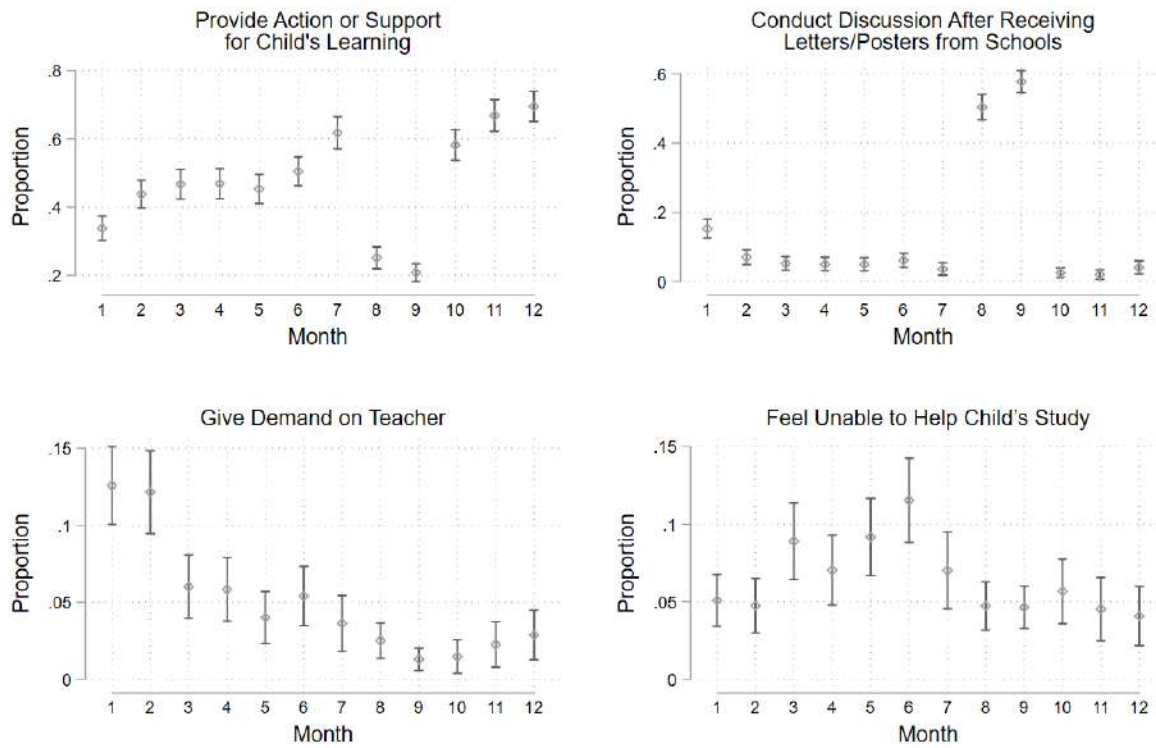


Table 1 Balance Test of Endline Time Invariant Variables

	Difference in Means	Control Mean and Standard Deviation
<i>Panel A: School characteristics (N = 130 schools)</i>		
Number of homeroom teachers	0.0154 (0.187)	6.446 (0.147)
Number of classrooms	-0.185 (0.248)	6.738 (0.254)
Total number of students	-1.877 (9.283)	139.231 (6.362)
Average number of students in one class	-0.569 (0.955)	21.000 (0.696)
School is accredited 'A' (Yes/No)	-0.0462 (0.0743)	0.354 (0.060)
Regional standardized test scores in 2018/2019	2.433 (1.704)	63.534 (1.181)
School facilities index	-0.216 (0.360)	0.108 (1.562)
<i>Panel B: Teacher characteristics (N = 508 teachers)</i>		
Teacher is a male (Yes/No)	0.0519 (0.0343)	0.313 (0.029)
Teacher's age (Years)	-1.066 (0.925)	42.472 (0.732)
Bachelor's degree and above (Yes/No)	-0.00404 (0.00833)	0.960 (0.012)
Teacher is a civil servant (Yes/No)	-0.00683 (0.0182)	0.687 (0.029)
Teacher has teacher certification (Yes/No)	-0.0127 (0.0359)	0.615 (0.031)
Number of students taught in Semester 2 2020/2021	-0.671 (0.876)	22.163 (0.453)
<i>Panel C: Household characteristics (N = 7,235 parents)</i>		
Primary caregiver is a male (Yes/No)	0.00660	0.138

	Difference in Means	Control Mean and Standard Deviation
	(0.011)	(0.006)
Primary caregiver's age (Years)	0.0794	38.968
	(0.368)	(0.141)
Primary caregiver has university degree (Yes/No)	0.0011	0.038
	(0.005)	(0.003)
Household size (Number of people)	0.0190	4.441
	(0.042)	(0.022)
Family speaks Indonesian as main language (Yes/No)	-0.0158	0.112
	(0.0103)	(0.005)
Primary caregiver can read and write (Yes/No)	0.0052	0.977
	(0.0038)	(0.002)
Primary caregiver can calculate basic math operation (Yes/No)	-0.0061	0.907
	(0.007)	(0.005)
Child is a male (Yes/No)	-0.00663	0.507
	(0.0101)	(0.008)
Wealth (Asset index)	0.0128	-0.012
	(0.043)	(0.026)

Standard errors in parentheses (standard errors are clustered at the sub-district level)

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

Table 2 Treatment Impact on Parental Involvement

	Difference in Means	Control Mean and Standard Deviation
Parental Direct Support Index	0.182***	
<i>Index is standardized to control group</i>	(0.0562)	
Accompany child when studying (Days/Week) [conveyed in Leaflet]	0.0129 (0.0753)	4.941 (0.024)
Help child with homework (Days/Week) [conveyed in Leaflet]	0.195* (0.115)	3.695 (0.032)
Ask and listen to child about school / learning activities (Days/Week) [conveyed in Leaflet]	0.142 (0.102)	4.148 (0.033)
Read books together with child (Days/Week) [conveyed in Leaflet]	0.258*** (0.0589)	3.076 (0.036)
Create study schedule with child (Yes/No) [conveyed in Leaflet]	0.111*** (0.0256)	0.354 (0.008)
Frequently act assertive to make child obeys study schedule (Yes/No) [conveyed in Leaflet]	0.118*** (0.0248)	0.310 (0.008)
Ensure child finishes schoolwork (Yes/No)	-0.0129 (0.0241)	0.829 (0.006)
Conducive Environment for Study Index	0.214***	
<i>Index is standardized to control group</i>	(0.0338)	
Discuss about school progress with other adults at home (Days/Week) [conveyed in Leaflet]	-0.0529 (0.104)	3.273 (0.037)

	Difference in Means	Control Mean and Standard Deviation
Provide sufficient lighting for studying (Yes/No) <i>[conveyed in Leaflet]</i>	-0.0214 (0.0174)	0.074 (0.004)
Turn television off while child is studying (Yes/No) <i>[conveyed in Leaflet]</i>	0.143*** (0.0253)	0.425 (0.008)
Putting gadget away from child, unless for studying (Yes/No) <i>[conveyed in Leaflet]</i>	0.0276 (0.0178)	0.165 (0.006)
Parents and adults not using gadget while child studying (Yes/No) <i>[conveyed in Leaflet]</i>	0.0183*** (0.00667)	0.027 (0.003)
Parents and other household members do not speak out loud when child is studying (Yes/No) <i>[conveyed in Leaflet]</i>	0.0594*** (0.0152)	0.113 (0.005)
Urge household members to not bother child when studying (Yes/No) <i>[conveyed in Leaflet]</i>	0.00821 (0.0166)	0.268 (0.007)
Provide child with study desk (Yes/No)	0.0439** (0.0201)	0.082 (0.005)
Ask child's friend to go home during study time (Yes/No)	0.0207** (0.00897)	0.078 (0.004)
<i>Parent's Communication with School Index</i> <i>Index is standardized to control group</i>	0.141*** (0.0521)	
Communicate with teacher 1-6 times per week in every month (Yes/No) <i>[conveyed in Leaflet]</i>	0.0358* (0.0217)	0.462 (0.008)

	Difference in Means	Control Mean and Standard Deviation
Frequently contact teacher to ask about child's learning progress (Yes/No) <i>[conveyed in Leaflet]</i>	0.0612*** (0.0115)	0.250 (0.007)
Frequently give advice / demand to teacher (Yes/No) <i>[conveyed in Leaflet]</i>	0.0263*** (0.00932)	0.097 (0.005)
Communicate with parents in <i>Paguyuban</i> 1-6 times per week in every month (Yes/No) <i>[conveyed in Leaflet]</i>	0.0514** (0.0256)	0.441 (0.008)
Communicate with other parents discussing about child's learning progress 1-6 times per week in every month (Yes/No) <i>[conveyed in Leaflet]</i>	0.0237 (0.0237)	0.529 (0.008)
<i>Parental Investment in Education</i>		
Register child in outside of school private tutoring (Yes/No)	0.0329* (0.0196)	0.138 (0.006)
Monthly educational expenditures (Ln of Rupiah)	0.120 (0.0789)	11.064 (0.019)

Standard errors in parentheses (standard errors are clustered at the sub-district level)

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

Table 3 Heterogeneity Analysis of the Impact on Parental Involvement

	Minimum Senior High School Education Level		Rich Family	
	Yes	No	Yes	No
<i>Parental Direct Support Index</i>	0.243*** (0.0679)	0.156*** (0.0562)	0.153** (0.0644)	0.209*** (0.0617)
Accompany child when studying (Days/Week)	0.0347 (0.105)	0.0102 (0.0716)	-0.0331 (0.0855)	0.0551 (0.0844)
Help child with homework (Days/Week)	0.230* (0.119)	0.189* (0.110)	0.119 (0.125)	0.265** (0.123)
Ask and listen to child about school / learning activities (Days/Week)	0.294** (0.132)	0.0661 (0.102)	0.131 (0.127)	0.152 (0.105)
Read books together with child (Days/Week)	0.450*** (0.0858)	0.164* (0.0849)	0.302*** (0.0908)	0.215** (0.0837)
Create study schedule with child (Yes/No)	0.105*** (0.0244)	0.114*** (0.0314)	0.0977*** (0.0279)	0.122*** (0.0300)
Frequently act assertive to make child obeys study schedule (Yes/No)	0.131*** (0.0276)	0.111*** (0.0286)	0.100*** (0.0260)	0.133*** (0.0296)
Ensure child finishes schoolwork (Yes/No)	0.00126 (0.0261)	-0.0184 (0.0241)	-0.0105 (0.0264)	-0.0148 (0.0242)
<i>Conducive Environment for Study Index</i>	0.213*** (0.0567)	0.214*** (0.0393)	0.200*** (0.0390)	0.227*** (0.0502)
Discuss about school progress with other adults at home (Days/Week)	-0.00208 (0.136)	-0.0800 (0.110)	0.0609 (0.123)	-0.156 (0.130)

	Minimum Senior High School Education Level		Rich Family	
	Yes	No	Yes	No
Provide sufficient lighting for studying (Yes/No)	-0.00279 (0.0206)	-0.0300* (0.0173)	-0.0123 (0.0210)	-0.0295 (0.0194)
Turn television off while child is studying (Yes/No)	0.153*** (0.0265)	0.138*** (0.0231)	0.126*** (0.0167)	0.159*** (0.0266)
Putting gadget away from child, unless for studying (Yes/No)	0.0292 (0.0214)	0.0270 (0.0167)	0.0239 (0.0174)	0.0311 (0.0205)
Parents and adults not using gadget while child studying (Yes/No)	0.0210** (0.00998)	0.0172** (0.00722)	0.0257*** (0.00932)	0.0117* (0.00694)
Parents and other household members do not speak out loud (Yes/No)	0.0459** (0.0182)	0.0657*** (0.0139)	0.0557*** (0.0168)	0.0628*** (0.0157)
Urge household members to not bother child when studying (Yes/No)	0.0295 (0.0250)	-0.00112 (0.0136)	0.0113 (0.0179)	0.00544 (0.0172)
Provide child with study desk (Yes/No)	0.0680*** (0.0249)	0.0338** (0.0162)	0.0420** (0.0214)	0.0460** (0.0195)
Ask child's friend to go home during study time (Yes/No)	0.0103 (0.0120)	0.0253*** (0.00699)	0.00373 (0.00875)	0.0360*** (0.0101)
<i>Communication with School Index</i>	0.178*** (0.0555)	0.130** (0.0624)	0.153*** (0.0485)	0.130** (0.0624)
Communicate with teacher 1-6 times per week in every month (Yes/No)	0.0719*** (0.0227)	0.0225 (0.0265)	0.0489** (0.0199)	0.0248 (0.0264)

	Minimum Senior High School Education Level		Rich Family	
	Yes	No	Yes	No
Frequently contact teacher to ask about child's learning progress (Yes/No)	0.0685*** (0.0170)	0.0605*** (0.0160)	0.0669*** (0.0110)	0.0566*** (0.0169)
Frequently give advice / demand to teacher (Yes/No)	0.0263*** (0.00992)	0.0269** (0.0116)	0.0311*** (0.00943)	0.0221* (0.0125)
Communicate with parents in <i>Paquyuban</i> 1-6 times per week in every	0.0488* (0.0294)	0.0554* (0.0308)	0.0388 (0.0253)	0.0632** (0.0313)
Communicate with other parents discussing about child's learning progress	0.0364 (0.0315)	0.0175 (0.0274)	0.0300 (0.0281)	0.0180 (0.0245)
Register child in outside of school private tutoring (Yes/No)	0.0564** (0.0273)	0.0228 (0.0185)	0.0262 (0.0229)	0.0398* (0.0205)
Monthly educational expenditures (Ln of Rupiah)	0.0560 (0.0973)	0.157** (0.0754)	0.128 (0.0914)	0.115 (0.0800)

Standard errors in parentheses (standard errors are clustered at the sub-district level)

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

Table 4 Treatment Impact on Teachers

	Difference in Means	Control Mean and Standard Deviation
Teacher's motivation due to collaboration with parents (Index score)	0.2047** (0.0745)	
Aware of student's learning progress (Yes/No)	0.168*** (0.0295)	0.579 (0.031)
Support for Individual Student Index <i>Index is standardized to control group</i>	0.312*** (0.0779)	
Live-teaching duration (Hours/Week)	-2.175** (1.085)	8.640 (0.505)
Checking and correcting students' assignments (Hours/Week)	0.0222 (0.665)	8.004 (0.377)
Give textbook to students at home (Yes/No)	0.0595* (0.0308)	0.901 (0.019)
Hold extra tutorials / consultation (Hours/Week)	0.774*** (0.261)	2.066 (0.220)
Return assignment/feedback to parents a few times in every month (Yes/No)	0.0902** (0.0420)	0.484 (0.032)
Provide enhancements to support the learning of high performing students (Yes/No)	0.0304 (0.0299)	0.635 (0.030)
Provide remedials to support the learning of low performing students (Yes/No)	0.100*** (0.0261)	0.544 (0.031)

	Difference in Means	Control Mean and Standard Deviation
Accept parents' advice and improve	0.126***	0.246
teaching & support towards students (Yes/No)	(0.0380)	(0.027)

Standard errors in parentheses (standard errors are clustered at the sub-district level)

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

Table 5 Heterogeneity Analysis of the Impact on Teachers

	Male Teacher		Civil Servant Teacher	
	Yes	No	Yes	No
Teacher's motivation due to collaboration with parents (Index score)	0.1635 (0.1628)	0.2325** (0.0976)	0.2277*** (0.0781)	0.1533 (0.174)
Aware of student's learning progress (Yes/No)	0.333*** (0.0680)	0.0880** (0.0393)	0.164*** (0.0357)	0.175*** (0.0579)
Support for Individual Student Index	0.255 (0.180)	0.344*** (0.0988)	0.455*** (0.0868)	0.0273 (0.184)
Live-teaching duration (Hours/Week)	-2.573* (1.389)	-2.006* (1.186)	-1.669 (1.090)	-3.237** (1.588)
Checking and correcting students' (Hours/Week)	0.0349 (0.828)	0.216 (0.918)	0.626 (0.770)	-1.227 (1.062)
Give textbook to students at home (Yes/No)	0.0242 (0.0355)	0.0757** (0.0321)	0.0521* (0.0274)	0.0762 (0.0645)
Hold extra tutorials / consultation (Hours/Week)	0.524 (0.553)	0.896** (0.395)	0.768** (0.357)	0.796 (0.557)
Return assignment/feedback to parents a few times in every month (Yes/No)	0.0277 (0.0674)	0.121** (0.0556)	0.0769* (0.0444)	0.118 (0.0821)
Provide enhancements to support the learning high performing students (Yes/No)	0.0869 (0.0712)	0.00443 (0.0442)	0.0817** (0.0372)	-0.0782 (0.0741)
Provide remedials to support the learning of low performing students (Yes/No)	0.0747 (0.0669)	0.114** (0.0492)	0.155*** (0.0385)	-0.0161 (0.0547)

	Male Teacher		Civil Servant Teacher	
	Yes	No	Yes	No
Accept parents' advice and improve teaching & support towards students (Yes/No)	0.120** (0.0588)	0.127** (0.0505)	0.130*** (0.0482)	0.119 (0.0766)

Standard errors in parentheses (standard errors are clustered at the sub-district level)

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

Table 6 Treatment Impact on Student Learning Behavior

	Difference in Means	Control Mean and Standard Deviation
<i>Student Learning Behavior Index</i>	0.0937*	
<i>Index is standardized to control group</i>	(0.0499)	
Study and/or do homework from teacher (Hours / Week)	0.118 (0.380)	10.183 (0.111)
Read non-academic books (Hours / Day)	0.0270 (0.0327)	0.226 (0.008)
Always obey study schedule at home (Yes/No)	0.0382*** (0.0115)	0.148 (0.006)

Standard errors in parentheses (standard errors are clustered at the sub-district level)

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

Table 7 Treatment Impact on Student Learning Outcome

	Difference in Means
Standardized mathematics test score	0.0337
	(0.0367)

Standard errors in parentheses (standard errors are clustered at the sub-district level)
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8 Heterogeneity Analysis of the Treatment Impact on Student Learning Outcome

Variable	Category	Heterogeneity Impact on Student's Learning Outcome
Student's Gender	Female	0.0363
		(0.0446)
	Male	0.0309
		(0.0381)
Family's Wealth	Poor	0.0628
		(0.0502)
	Rich	0.0179
		(0.0363)
Parental Education	Lower than Senior Secondary School	0.00881
		(0.0462)
	Minimum Senior Secondary School	0.0760**
		(0.0385)
Teacher's Gender	Female	0.0354
		(0.0480)
	Male	0.0265
		(0.0503)
Gender similarity between student and teacher	No	0.0187
		(0.0431)
	Yes	0.0507
		(0.0432)
Teacher's Employment Status	Non – Civil Servant	0.0854*
		(0.0510)
	Civil Servant	0.0102
		(0.0418)
School's Regional Standardized Test Score	Below Average	0.0375
		(0.0518)
	Above Average	0.0380
		(0.0599)

Standard errors in parentheses (standard errors are clustered at the sub-district level)

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

Appendix

Appendix A1 Leaflets from February 2020 until April 2021

Leaflet for February 2020



Translation of Leaflet for February 2020

Page 1:

Involved Parents Great Child!

If parents are involved in child's education, then...

- Child will be more motivated to study.
- Child will easily socialize with friends.
- Child's academic achievement will improve.

If you want your child to be great, please be actively involved in child's education!

Page 2:

How can parents be actively involved in child's learning process?

1. Accompany child in studying every day.
2. Ensure that the place where child studies is quite and free from any disturbance, such as, the sound of television.
3. Read together with child.
4. Ask child to tell his/her activities in school.
5. Motivate child if he/she gets low test score.
6. Ask teacher about the progress of child's learning.
7. Be active in *Paguyuban* (group of parents).

Leaflet for March 2020



Translation of Leaflet for March 2020

Involved Parents, Great Child!

Let's Accompany Child in Learning!

We do not have to be smart or highly educated, all parents can accompany their child in learning.

Do these ways every day:

1. Create child's study schedule at home.
2. Sit and accompany child in learning.
3. Create quite situation so that child can focus on learning.
4. When parents struggle to help child in learning, do not be ashamed to ask for help from another person who is more capable.
5. Spare time to check on child's study.

Keep on doing those 5 ways above. Never give up!

Leaflet for April 2020



Translation of Leaflet for April 2020

Involved Parents, Great Child!

Let's Provide a Conducive Environment for Child to Study at Home!

Silent and conducive environment would make child focus and concentrate during studying.

Support child's study by:

1. Provide sufficient lighting.
2. Turn off the television.
3. Keep child away from gadget (except for browsing study materials from the internet).
4. Parents do not talk loudly.
5. Parents do not play gadget or watch television when the child is studying.

Leaflet for May 2020



Translation of Leaflet for May 2020

Involved Parents, Great Child!

Let's Read Together with Child!

Reading together with child would improve the child's knowledge and reading skill.

To make reading activities interesting, ask the child to read other kinds of book (fairy-tale book, magazine, biography, and encyclopedia).

Do these type of actions when reading together with the child:

1. Ask the child to read together for at least 15 minutes everyday. Read together out loud to improve child's confidence.
2. Guide the child in understanding hard words/sentences.
3. When finished reading, ask for child's opinion regarding the book.
4. Praise child after finishing reading so that the child keeps on motivated.
5. Other than reading books at home, ask the child to borrow books from the school library or village library.

Leaflet for August 2020



Translation of Leaflet for August 2020

Involved Parents, Great Child!

Ways to be Successful in Accompanying Child during the Learning from Home

During the COVID-19 pandemic, the child has to learn from home as it is still uncertain on when this pandemic would end.

Do these type of actions when reading together with the child:

Create Daily Study Schedule

- Ask the child to create a study schedule together.
- The schedule can be divided into several sessions, interspersed with a rest. Each study session is 1-2 hours so that the child does not get bored.
- Praise the child when he/she obeys the schedule.

Learn from Daily Activities

- Ask the child to study while doing daily activities.
- Utilise the internet, television, or radio to look for other source of learning materials.

For Parents to Avoid Stress

- If parents are tired, take a rest for a while before accompanying the child studying.
- Do not hesitate to ask to the teacher about the learning materials.
- Ask the neighbours whose children are at the same age if parents face difficulties in accompanying the child to study.

Keep on doing the activities mentioned on the previous leaflets so that the child can be successful in learning from home!

Leaflet for September 2020



Translation of Leaflet for September 2020

Involved Parents, Great Child!

Let's Ask Children about Their Activities at School!

By asking the child to tell their stories, the child would feel being cared for and more open to parents. The relationship between child and parents also becomes tighter.

How to make child feels comfortable to tell stories to parents?

- Give a question that stimulates child to tell more stories.
- To make the child feels being appreciated, give full attention when the child is speaking.
- Wait until the child finishes his/her story, then give our responses.
- Give response with a curious face and intonation. Use words that are understandable by the child.
- Put ourselves in our child position so that we can understand his/her thought and feeling.
- Show a feeling of empathy of child's sadness. But keep on asking the child to think positively.
- Avoid giving a Yes/No question.
- Avoid doing other activities while the child is talking, for instance, watching television, calling on the phone, or using the gadget.
- Avoid talking fast when giving our response or dominating the conversation.
- Avoid blaming or underestimating the child when he/she is telling about his/her sadness.
- Avoid comparing the child with his/her better friend.

Leaflet for October 2020



Encourage child to study so that

1. Child feels challenged to learn new things even though they are hard.
2. Child does not give up easily when facing difficulties.
3. Child will improve his/herself and try harder when fails.
4. Child will not blame other people or situation when fails.

Translation of Leaflet for October 2020

Involved Parents, Great Child!

Let's Motivate Child to Study!

Become a parent who appreciates the child's effort. Motive the child to study diligently. Avoid only prioritising the test scores.

How to motivate the child to study?

- Praise child when he/she studies diligently.
- Accompany and help child studies.
- Encourage the child to learn new or difficult things.
- When the child faces failure, say, "It is okay, try it again. You can do it if you keep on trying".
- Avoid praising child only when he/she gets good grades.
- Avoid demanding child to always obtain good grades.
- Avoid showing anger/disappointment when child gets bad grades.
- When the child faces failure, avoid saying, "You are not smart, no wonder you cannot do it".

"Test scores are the outcomes of effort. Only perseverance in trying would result in good test scores"

Leaflet for November 2020



Translation of Leaflet for November 2020

Involved Parents, Great Child!

Let's Communicate with Teachers!

Communicate routinely with the teacher to know your child's learning progress, not only when your child faces trouble!

Please contact the teacher through telephone, WhatsApp, or meeting the teacher face to face at school.

What can parents communicate about with teacher?

1. Ask the child's learning progress at school.
2. Ask the assignments that should be done at home.
3. Ask ways to motivate child to study at home.
4. Tell the progress or difficulties that the child face when learning at home.
5. Ask ways to help the child's learning struggle at home.

"Do not hesitate to communicate with teacher! Make the teacher as your friend!"

Leaflet for January 2021



Translation of Leaflet for January 2021

Involved Parents, Great Child!

Let's Communicate with Other Parents!

Educating child will be easier if each of the parents helps each other.

Develop tight relationship with other parents through regular communication.

Utilize face-to-face interaction or conversations through WhatsApp to communicate with other parents and Paguyuban group.

Communicate with other parents so that:

- Parents do not miss out on information about child's school assignment and learning progress.
- Parents get the ways to help with child's academic struggle.

Do this in communicating with other parents:

- Ask about assignment and learning progress.
- Ask about other sources for learning (books, library, internet, etc.)
- Do not be shy to tell about child's hardship.
- Ask other parents about their experience or advice in overcoming child's learning struggles.
- Apply other parents' success stories in helping with child's study.
- Help other parents in overcoming their child's learning struggle.

Leaflet for February 2021



Translation of Leaflet for February 2021

Involved Parents, Great Child!

Let's Build Child's Discipline in Learning!

Discipline in learning is one of the keys for child's success.

Parents have to make studying as a regular activity to be conducted every day, so that child becomes discipline.

Do these steps so that child becomes discipline in learning:

1. Tell child about the importance of learning.
2. Make study schedule which is commonly agreed and written with child.
3. Commonly agree on the consequence that child will get if child does not obey the study schedule.
4. If child breaks the study schedule, remind again on the established agreement.
5. If child still resist to study, act assertive in applying the consequence.
6. Do not give up if child keeps on objecting to study. Keep on applying the consequence until the child wants to study.

Do not surrender if it is hard to make child obeys the study schedule in the beginning. Keep act assertively until child realizes that studying is an activity that must be regularly done.

Leaflet for March 2021



Translation of Leaflet for March 2021

Involved Parents, Great Child!

Be a Role Model in Supporting Child's Learning!

A child will pay attention and follow the parents' actions. Therefore, parents need to be a good role model for child's learning.

By that, a child will be motivated and consider learning as a family culture.

Do these steps to become a good role model for child's learning:

1. Accompany child in studying if the child still needs to be accompanied in learning.
2. If child has already been able to study by her/himself, do other activities that do not disturb the child's study.
3. Give up parents' time to watch TV or play gadget if it is the time for child's study.
4. Avoid talking out loud when child is studying.
5. Ask other family members to implement these actions.
6. Spare time to accompany child in learning. Although if it is a short time, parent's attention matters a lot for the child.

Leaflet for April 2021



Has child been used to reading every day at home?

1. Provide interesting readings for child.
2. Accompany child when reading.
3. Help child to understand difficult words.

Have you regularly discussed about child's learning progress with teacher?

1. Ask about assignments that child needs to do at home.
2. Do not be shy in conveying advice or complaints to the teacher.
3. Be active in group of parents or Paguyuban.

Translation of Leaflet for April 2021

Involved Parents, Great Child!

Let's Be Actively Involved in Child's Education!

Do you want your child to be successful?
Keep on being actively involved in child's study at home.

Has child been disciplined in obeying study schedule?

1. Help child when he/she is struggling when studying.
2. Praise child's diligence in studying.
3. Ask child to talk about the things that child has studied.

Has child obtained conducive environment when learning?

1. Turn television off when child is studying.
2. Avoid using gadget when child is studying.
3. Ask other household members to do their own obligations during child's study time.

Educating a child is a long process that needs to be done sustainably with big patience. Keep on being involved for your child's success!

Appendix A2 Letter of Student's Learning Process (Translated into English)

Grade 1 - Primary School

Page 1 of 2

Report of Child's Learning in February 2020

School Name :
Student Name :
Class :

Sir and Madam, this letter is designated to give information on what your child still struggles to comprehend in the last month, and what your child would learn in this month.

In the last January 2020, child _____ still STRUGGLES in learning about (*only the ticked option* [✓]):

MATH – Theme: _____

Explaining the meaning of the whole numbers until 99 as part of a collection of objects.

Sub-theme: _____. Especially, _____

Explaining numbers in tens and their placement value using a group of concrete objects and how to read the numbers.

Sub-theme: _____. Especially, _____

Comparing two numbers in tens by using a group of concrete objects.

Sub-theme: _____. Especially, _____

Conducting addition and subtraction of numbers which involves whole numbers of up to 99 in daily life as well as relate the addition and subtraction.

Sub-theme: _____. Especially, _____

Identifying the plane figure that can be arranged into pattern of tessellation.

Sub-theme: _____. Especially, _____

Knowing and determining the length and weight with non-standard units using concrete objects or situation.

Sub-theme: _____. Especially, _____

Comparing length, weight, time, and temperature using concrete objects or situation.

Sub-theme: _____. Especially, _____

INDONESIAN LANGUAGE – Theme: _____

Decomposing vocabularies of various objects in the surrounding environment through short text (picture, simple slogan, writings, and/or song lyric) and/or environment exploration.

Sub-theme: _____. Especially, _____

Determining vocabularies that are related to occurrences in the afternoon and at night through short text (picture, simple slogan, writings, and/or song lyric) and/or environment exploration.

Sub-theme: _____. Especially, _____

Detailing expressions of thank you, apology, help, praise, invitation, announcement, instruction, and order to other people by using a polite language verbally and non-verbally.

Sub-theme: _____. Especially, _____

Examining children poetry / song lyric (consisting of admiration, pride, respect to elderly, affection, or friendship) that are listened for fun.

Sub-theme: _____. Especially, _____

Letter of Student's Learning Process – Translated into English (cont'd)

Grade 1 - Primary School

Page 2 of 2

In this February 2020, child _____ WILL STUDY about (*only the ticked option* [✓]):

MATH – Theme: _____

Explaining the meaning of the whole numbers until 99 as part of a collection of objects.

Explaining numbers in tens and their placement value using a group of concrete objects and how to read the numbers.

Comparing two numbers in tens by using a group of concrete objects.

Conducting addition and subtraction of numbers which involves whole numbers of up to 99 in daily life as well as relate the addition and subtraction.

Identifying the plane figure that can be arranged into pattern of tessellation.

Knowing and determining the length and weight with non-standard units using concrete objects or situation.

Comparing length, weight, time, and temperature using concrete objects or situation.

INDONESIAN LANGUAGE – Theme: _____

Decomposing vocabularies of various objects in the surrounding environment through short text (picture, simple slogan, writings, and/or song lyric) and/or environment exploration.

Determining vocabularies that are related to occurrences in the afternoon and at night through short text (picture, simple slogan, writings, and/or song lyric) and/or environment exploration.

Detailing expressions of thank you, apology, help, praise, invitation, announcement, instruction, and order to other people by using a polite language verbally and non-verbally.

☐ Examining children poetry / song lyric (consisting of admiration, pride, respect to elderly, affection, or friendship) that are listened for fun.

Special Note:

Therefore, I ask for your cooperation to accompany your child in learning the materials that your child still struggles in and accompany your child in preparing for the learning process in this November. If there is anything that you would like to ask, please contact me on _____. I would be delighted to help you, Sir and Madam.

_____, _____
(_____)

“Have you accompanied your child studying today?”

(Keep this part of the letter along with the poster at home in order to be read again by parents)

(Fill in, sign, then cut this section to be returned to the teacher)

What would you, Sir / Madam, do after reading the report of child's learning and leaflet that are given in this February 2020?

(_____)

Parent Name : _____
School Name : _____

Student Name : _____
Class : _____

Table A1 Robustness Test for the Impact on Parental Involvement

	OLS	Randomization Inference	Multiple Hypothesis Testing
<i>Parental Direct Support Index</i>	0.1819***	0.1819**	0.1819***
<i>Index is standardized to control group</i>	[0.001]	[0.028]	[0.003]
Accompany child when studying (Days/Week) <i>[conveyed in Leaflet]</i>	0.0129 [0.859]	0.0129 [0.893]	0.0129 [0.301]
Help child with homework (Days/Week) <i>[conveyed in Leaflet]</i>	0.195* [0.101]	0.195* [0.055]	0.195** [0.042]
Ask and listen to child about school / learning activities (Days/Week) <i>[conveyed in Leaflet]</i>	0.142 [0.192]	0.142 [0.345]	0.142 [0.119]
Read books together with child (Days/Week) <i>[conveyed in Leaflet]</i>	0.258*** [0.000]	0.258** [0.015]	0.258** [0.021]
Create study schedule with child (Yes/No) <i>[conveyed in Leaflet]</i>	0.111*** [0.000]	0.111*** [0.009]	0.111*** [0.001]
Frequently act assertive to make child obeys study schedule (Yes/No) <i>[conveyed in Leaflet]</i>	0.1176*** [0.000]	0.1176*** [0.005]	0.1176*** [0.001]
Ensure child finishes schoolwork (Yes/No)	-0.0129 [0.551]	-0.0129 [0.714]	-0.0129 [0.203]
<i>Conducive Environment for Study Index</i>	0.2142***	0.2142**	0.2142***
<i>Index is standardized to control group</i>	[0.000]	[0.003]	[0.001]
Discuss about school progress with other adults at home (Days/Week) <i>[conveyed in Leaflet]</i>	-0.0529 [0.559]	-0.0529 [0.719]	-0.0529 [0.203]

	OLS	Randomization Inference	Multiple Hypothesis Testing
Provide sufficient lighting for studying (Yes/No) <i>[conveyed in Leaflet]</i>	-0.0214 [0.221]	-0.0214 [0.426]	-0.0214 [0.131]
Turn television off while child is studying (Yes/No) <i>[conveyed in Leaflet]</i>	0.143*** [0.000]	0.143*** [0.001]	0.143*** [0.001]
Putting gadget away from child, unless for studying (Yes/No) <i>[conveyed in Leaflet]</i>	0.0276 [0.123]	0.0276 [0.245]	0.0276 [0.085]
Parents and adults not using gadget while child studying (Yes/No) <i>[conveyed in Leaflet]</i>	0.0183*** [0.007]	0.0183* [0.056]	0.0183** [0.015]
Parents and other household members do not speak out loud when child is studying (Yes/No) <i>[conveyed in Leaflet]</i>	0.0594*** [0.000]	0.0594*** [0.004]	0.0594*** [0.001]
Urge household members to not bother child when studying (Yes/No) <i>[conveyed in Leaflet]</i>	0.00821 [0.621]	0.00821 [0.703]	0.00821 [0.211]
Provide child with study desk (Yes/No)	0.0439** [0.031]	0.0439** [0.032]	0.0439** [0.038]
Ask child's friend to go home during study time (Yes/No)	0.0207** [0.022]	0.0207** [0.037]	0.0207** [0.032]
<i>Parent's Communication with School Index</i> <i>Index is standardized to control group</i>	0.1405*** [0.003]	0.1405* [0.083]	0.1405*** [0.008]
Communicate with teacher 1-6 times per week in every month (Yes/No) <i>[conveyed in Leaflet]</i>	0.0358* [0.072]	0.0358* [0.076]	0.0358* [0.067]

	OLS	Randomization Inference	Multiple Hypothesis Testing
Frequently contact teacher to ask about child's learning progress (Yes/No) <i>[conveyed in Leaflet]</i>	0.0612*** [0.000]	0.0612*** [0.004]	0.0612*** [0.001]
Frequently give advice / demand to teacher (Yes/No) <i>[conveyed in Leaflet]</i>	0.0263*** [0.009]	0.02623* [0.076]	0.02623** [0.021]
Communicate with parents in <i>Paquyuban</i> 1-6 times per week in every month (Yes/No) <i>[conveyed in Leaflet]</i>	0.0514** [0.056]	0.0514* [0.069]	0.0514* [0.056]
Communicate with other parents discussing about child's learning progress 1-6 times per week in every month (Yes/No) <i>[conveyed in Leaflet]</i>	0.0237 [0.306]	0.0236 [0.487]	0.0236 [0.162]
<i>Parental Investment in Education</i>			
Register child in outside of school private tutoring (Yes/No)	0.0329* [0.096]	0.0329 [0.111]	0.0329* [0.074]
Monthly educational expenditures (Ln of Rupiah)	0.120 [0.108]	0.120 [0.355]	0.120* [0.078]

P-values are in squared brackets

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

Table A2 Robustness Test for the Impact on Teachers

	OLS	Randomization Inference	Multiple Hypothesis Testing
Teacher's motivation due to collaboration with parents (Index score)	0.2047** [0.026]	0.2047* [0.073]	0.2047** [0.027]
Aware of student's learning progress (Yes/No)	0.168*** [0.000]	0.168*** [0.007]	0.168*** [0.001]
Support for Individual Student Index <i>Index is standardized to control group</i>	0.3119*** [0.002]	0.3119** [0.021]	0.3119*** [0.007]
Live-teaching duration (Hours/Week)	-2.175** [0.056]	-2.175*** [0.009]	-2.175** [0.017]
Checking and correcting students' assignments (Hours/Week)	0.0222 [0.974]	0.0222 [0.982]	0.0222 [0.216]
Give textbook to students at home (Yes/No)	0.0595* [0.065]	0.0595** [0.036]	0.0595** [0.027]
Hold extra tutorials / consultation (Hours/Week)	0.774*** [0.007]	0.774* [0.052]	0.774** [0.024]
Return assignment/feedback to parents a few times in every month (Yes/No)	0.0902** [0.038]	0.0902* [0.065]	0.0902** [0.031]
Provide enhancements to support the learning high performing students (Yes/No)	0.0304 [0.475]	0.0304 [0.477]	0.0304 [0.105]
Provide remedials to support the learning of low performing students (Yes/No)	0.100*** [0.001]	0.100** [0.029]	0.100** [0.023]

	OLS	Randomization Inference	Multiple Hypothesis Testing
Accept parents' advice and improve teaching & support towards students (Yes/No)	0.126*** [0.001]	0.126** [0.034]	0.126*** [0.006]

P-values are in squared brackets

· $p < 0.10$, ·· $p < 0.05$, ··· $p < 0.01$

Table A3 Robustness Test for the Impact on Student's Learning Behavior

	OLS	Randomization Inference	Multiple Hypothesis Testing
<i>Student Learning Behavior Index</i>	0.0937*	0.0937*	0.0937
<i>Index is standardized to control group</i>	[0.063]	[0.071]	[0.105]
Study and/or do homework from teacher (Hours / Week)	0.118 [0.776]	0.118 [0.815]	0.118 [0.586]
Read non-academic books (Hours / Day)	0.0270 [0.277]	0.0270 [0.601]	0.0270 [0.227]
Always obey study schedule at home (Yes/No)	0.0382*** [0.002]	0.0382** [0.044]	0.0382*** [0.009]

P-values are in squared brackets

· $p < 0.10$, ·· $p < 0.05$, ··· $p < 0.01$

Table A4 Robustness Test for the Impact on Student's Test Score

	OLS	Randomization Inference
Standardized mathematics test score	0.0337 [0.338]	0.0337 [0.529]
P-values are in squared brackets * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$		