Lowering Barriers to Remote Education: Experimental Impacts on Parental Responses and Learning

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Motivation: Understand barriers to parental educational investments

- Educational emergencies (e.g., COVID-19) increase urgency of interventions to improve education access
- Parental investments affect children's human capital development (Becker and Tomes, 1976; Cunha et al., 2006; Todd and Wolpin, 2007)
  - Two broad categories: time and economic investments
  - Especially important in contexts with unreliable schooling quality
- Barriers prevent parental investment optimization

How does lowering barriers to educational services take-up affects parental investment decisions and, subsequently, educational outcomes?

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Our study: RCT in Bangladesh during Covid-19 school closures

Research question: How do parents adjust their investments in response to reduced barriers to remote education?

- How do parental responses differ by socioeconomic status?
- How do these policies affect persistent learning?

Approach: Randomized experiment during 2020-2021 school closures

- 7,576 households of secondary school students across Bangladesh, HH owns smartphone
- 3 interventions relieving different barriers to educational services take-up
- 2 phone surveys to measure the responses while the interventions were ongoing, and to measure persistence after

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Experiment: 3 interventions to improve access to personalized learning

(1) Information and reminders about the internet learning platform

10-minute school

Free app/website with videos and adaptive quizzing

More

Sangsad TV

Full randomization

Experiment: 3 interventions to improve access to personalized learning

(1) Information and reminders about the internet learning platform

(2) Information + Data subsidy

Data subsidy

1-month 10GB data package (untied)

Sangsad TV

Full randomization

Experiment: 3 interventions to improve access to personalized learning

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(2) Information + Data subsidy

(3) Individual teacher support

Teacher outreach

Weekly check-in calls from teacher

▸ Sangsad TV ▸ Full randomization

Experiment: 3 interventions to improve access to personalized learning

(1) Information and reminders about the internet learning platform

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Duration: 4-8 weeks (Feb-April 2021)

Teacher outreach

Weekly check-in calls from teacher

Sangsad TV

Full randomization

Descriptive statistics

- Three sources:
  1. Random Digit Dialing (RDD)
  2. Gov. school stipend recipients
  3. Gov. online education platform users
- Wide distribution of parental education
- High rates of school work, private tutoring

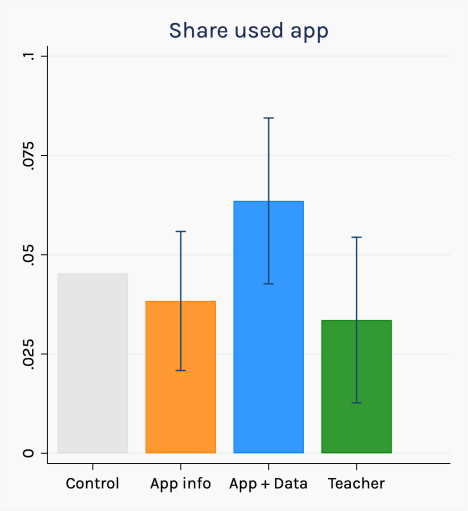
	Mean	Std.Dev.	Obs
Number of children	1.93	0.99	9027
Number of children grades 6-10	1.30	0.54	8908
HH has TV with cable/satellite	0.65	0.48	9038
Respondent is mother	0.50	0.50	9044
Respondent is father	0.50	0.50	9044
Mother completed primary	0.38	0.48	8227
Mother completed secondary	0.20	0.40	8227
Mother completed post-secondary	0.19	0.40	8227
Father completed primary	0.27	0.45	8397
Father completed secondary	0.18	0.38	8397
Father completed post-secondary	0.27	0.45	8397
Days of school work, last week	5.73	2.20	8758
Weekly days of school work, April 2020	5.63	1.85	8397
Received private tutoring since closures	0.59	0.49	8807
Child did work for pay, past 30 days	0.03	0.17	8802

Sample balance

Changes on the use of specific learning resources

1. Only app info alongside subsidy increases its usage

- Info alone not sufficient
- App + subsidy ↑ 1.8pp app use
  - 36% increase (low baseline)
  - ↑ only among high-SES HHs (4.1pp vs 0pp)

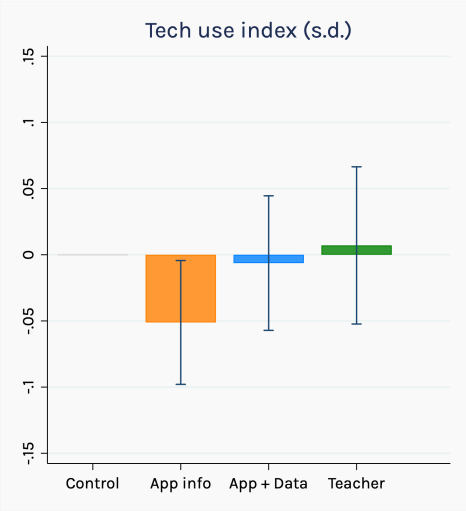


Changes on the use of specific learning resources

1. Only app info alongside subsidy increases its usage

2. App info alone reduces use of tech

- App info ↓ 0.051-SD in tech-learning resources use
- Other interventions do not affect net tech usage
- Intensive margin results similar



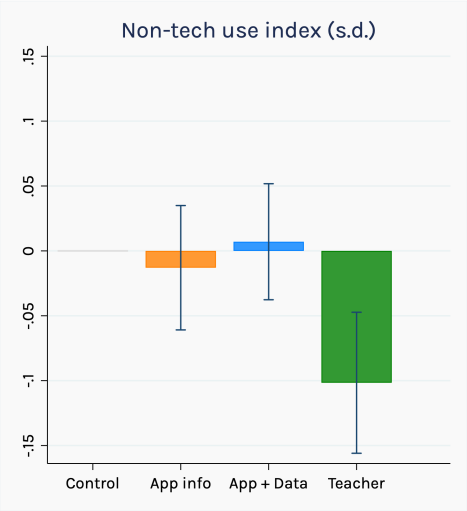
Changes on the use of specific learning resources

1. Only app info alongside subsidy increases its usage

2. App info alone reduces use of tech

3. Teacher support decreases the use of non-tech resources

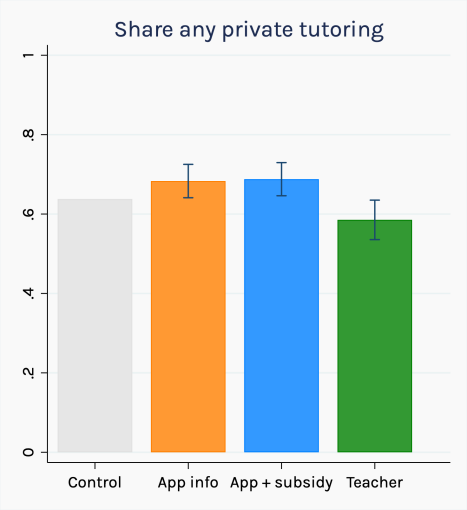
- ↓ 0.1-SD non-tech resource use



Significant impacts on parental investments

1. Interventions affect parental educational investments

- App only ↑ 4.5pp private tutor (7%)
- App + subsidy ↑ 5.0pp private tutor (7%)
- Teacher support ↓ likelihood of receiving private tutoring

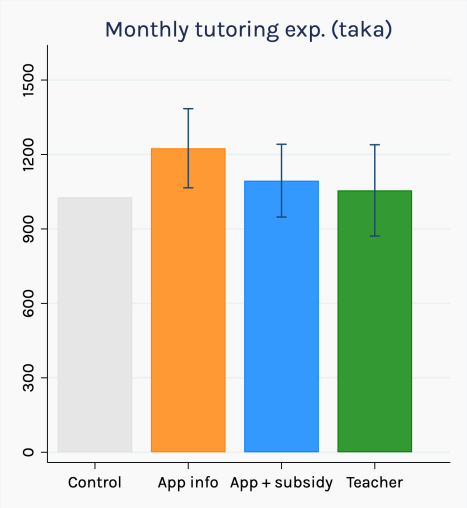


Significant impacts on parental investments

1. Interventions affect parental educational investments

2. Data subsidy and info. attenuate parental responses

- App only ↑ 19% weekly tutoring expenses
- Subsidy mutes response
- No impact of teaching

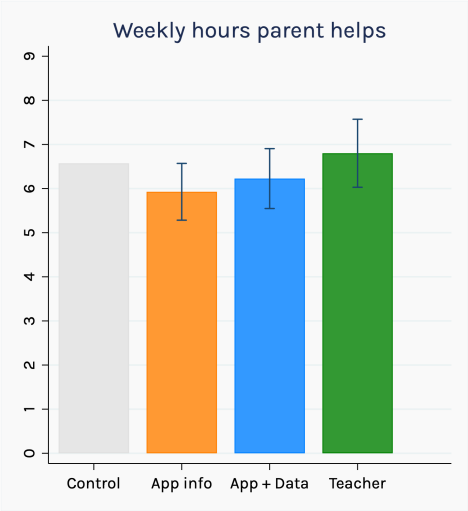


Significant impacts on parental investments

1. Interventions affect parental educational investments

2. Data subsidy and info. attenuate parental responses

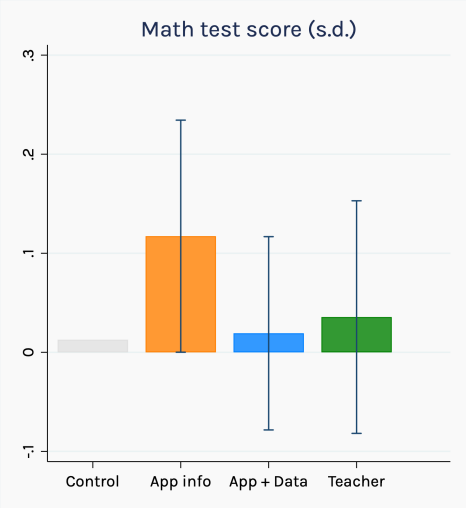
3. When tutoring increases, parental hours fall



Suggestive impacts of interventions on student math knowledge

- App information ↑ 0.11 SD
  - ↑ only among high-SES HHs (.205 vs. 0.001 s.d)
  - → SES differences in ↑ tutoring: Intensity or quality, additional barriers, different starting points?
- Data subsidy and info. no effect
- Teacher support no effect

→ Tutoring seem to cause ↑, not app



Conclusions and policy implications

1. Offering an educational service may lead to parents reoptimizing their educational investments even without adoption

- May act as a signal or nudge, and still have lasting effects on achievement
- Taking parental responses into account is key for results interpretation

2. Multiple barriers to tech usage, subsidies can (modestly) help

- Information alone insufficient to increase tech usage
- Subsidy increases use of app, but only among wealthier HH

3. Policies aimed at $\downarrow$ barriers may exacerbate educational inequalities

- Light-touch interventions $\uparrow$ learning of households with resources to respond to them

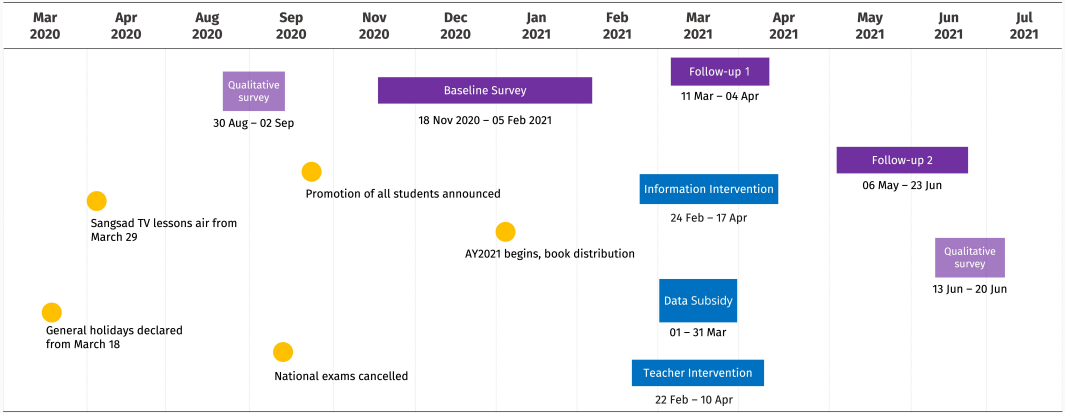
References

Becker, G. S. and N. Tomes (1976). Child Endowments and the Quantity and Quality of Children. *Journal of Political Economy 84*(4), S143–S162.

Cunha, F., J. J. Heckman, L. Lochner, and D. V. Masterov (2006). Chapter 12 Interpreting the Evidence on Life Cycle Skill Formation. In E. Hanushek and F. Welch (Eds.), *Handbook of the Economics of Education*, Volume 1, pp. 697–812. Elsevier.

Todd, P. E. and K. I. Wolpin (2007). The Production of Cognitive Achievement in Children: Home, School, and Racial Test Score Gaps. *Journal of Human Capital 1*(1), 91–136.

Project timeline



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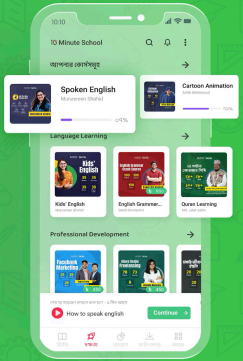
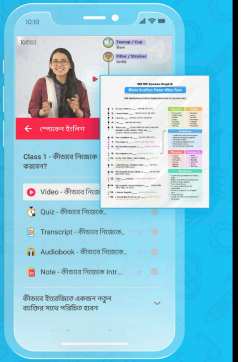
দক্ষতা উন্নয়ন

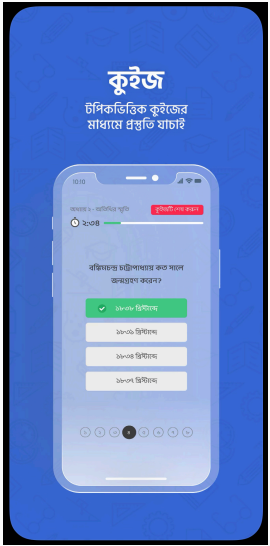
সর্বাধিক জনপ্রিয় স্কিল
ডেভেলপমেন্ট কোর্সসমূহ

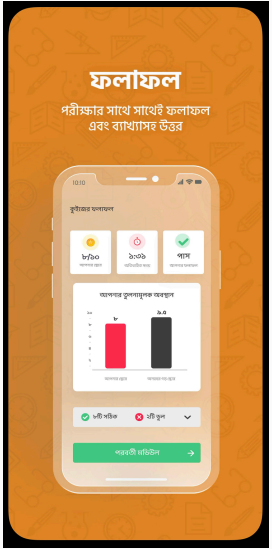


শিখন উপকরণ

টপিকভিত্তিক ভিডিও, কুইজ,
লেকচার শিট এবং লাইভ ক্লাস




কুইজ
টার্শিকভিত্তিক কুইজের
মাধ্যমে প্রস্তুতি যাচাই
10:10
অধ্যায় ৯ - ঘটনিক স্মৃতি
কুইজটি শেষ করুন
২:০৪
বঙ্কিমচন্দ্র চট্টোপাধ্যায় কত সালে
জন্মগ্রহণ করেন?
১৮৩৮ খ্রিস্টাব্দে
১৮৩৯ খ্রিস্টাব্দ
১৮৩৪ খ্রিস্টাব্দ
১৮৩৭ খ্রিস্টাব্দ


ফলাফল
পরীক্ষার সাথে সাথেই ফলাফল
এবং ব্যাখ্যাসহ উত্তর
10:10
কুইজের ফলাফল
৮৭%০
সঠিকভাবে উত্তর
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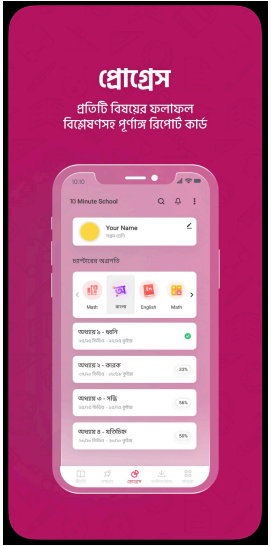
অতিবাহিত সময়
পাস
অবস্থানের অবস্থান
অধ্যায়ের তুলনামূলক অবস্থান
৮
৯.৫
সঠিকভাবে উত্তর
অংশগ্রহণ করা
৮টি সঠিক
১টি ভুল
পরবর্তী প্রশ্নটিতে


প্রোগ্রেস
প্রতিটি বিষয়ের ফলাফল
বিশ্লেষণসহ পূর্ণাঙ্গ রিপোর্ট কার্ড
10:10
10 Minute School
Your Name
বাংলা
English
Math
অধ্যায় ১ - ধ্বনি
অধ্যায় ২ - বর্ণক
৩৩%
অধ্যায় ৩ - সন্ধি
৬৪%
অধ্যায় ৪ - ঘটনিক
৫৯%

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Randomization

N = 7,576	Information			
	None	General	Adaptive	General + Adaptive
No data	**25%** 1894	**18.75%** 1423	**12.5%** 947	**12.5%** 947
Data		**6.25%** 471	**12.5%** 947	**12.5%** 947

Teacher support	~44% within cells

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Contrasting impacts of App info. vs. TV info. (one-size-fits-all)

Impacts of TV info

1. Affects targeted use: ↑ 3.5pp (17.5%) Sangsad TV use, no other substit.
2. Doesn't change parental investment responses

   ⇒ **Parental investment responses to app info are *not* due to general salience/reminders about importance of education**

Impacts of TV info + Data package

1. Affects targeted *and expensive* resource use: ↑ 8.7pp (35%) video lessons
2. Affects private tutoring use: ↑ 9.2 pp (14%) use of private tutor

   ⇒ **Confirms data is a constraint to using high-price resources**

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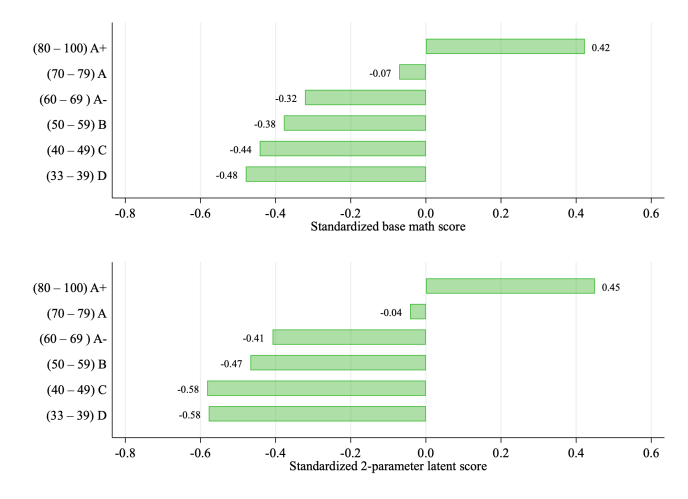
Distribution of endline math scores by self-reported Grade 5 exam scores



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Sample largely balanced across key covariates

	(1) All	(2) Control	(3) App info	(4) Data + App info.	(5) Teacher	(6) Joint tests, all, p-val
HH size	1.92	1.91	1.96	1.90	1.92	0.845
	(0.99)	(0.99)	(1.00)	(1.00)	(1.02)	
Num. secondary children	1.30	1.27	1.32**	1.29	1.30	0.469
	(0.53)	(0.50)	(0.55)	(0.53)	(0.59)	
Has cable/satellite TV	0.65	0.65	0.63	0.65	0.66	0.260
	(0.48)	(0.48)	(0.48)	(0.48)	(0.47)	
Mother present	0.49	0.50	0.48	0.51	0.49	0.790
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	
Mother income	4864	4550	4492	5921*	3394	0.000***
	(25390)	(24830)	(23506)	(28666)	(21705)	
Father income	51555	51415	52910	51328	50834	0.726
	(134271)	(134679)	(138072)	(132713)	(130614)	
School days/week, curr.	5.70	5.76	5.67	5.71	5.64	0.917
	(2.23)	(2.17)	(2.26)	(2.21)	(2.29)	
School days/week, Apr. 20	5.37	5.38	5.37	5.37	5.43	0.923
	(2.16)	(2.18)	(2.14)	(2.16)	(2.12)	
Has private tutor	0.59	0.58	0.60	0.59	0.60	0.818
	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	
Working for pay	0.03	0.03	0.03	0.03	0.02	0.622
	(0.17)	(0.18)	(0.17)	(0.16)	(0.15)	
Number of students	8771	2175	2219	2189	954	
Number of households	7576	1894	1891	1897	828	
Joint test, p-val			0.079*	0.612	0.465	

No evidence of differential attrition by treatment arm in March 2021 ($p = 0.15$), no difference relative to control group of key arms in June 2021, but reject overall equality ($p = 0.061$).