

Online Appendix

Nurturing Childhood Curiosity to Enhance Learning: Evidence from a Randomized Pedagogical Intervention

Sule Alan and Ipek Mumcu

Contents

A Additional Tables	2
B Additional Figures	17
C Implementation Items and Moments	24
D Instructions for Incentivized Games	25
D.1 Curiosity Task	25
D.2 Risk and Ambiguity Games	27
E Survey Inventories	28

A Additional Tables

Table B1: Variable List

	Study 1			Study 2	
	Baseline October 2018	Endline May 2019	Long Term October 2021	Baseline October 2021	Endline May 2022
Student					
Gender	✓			✓	
Age in Months	✓			✓	
Siblingship Size	✓			✓	
Birth Order	✓			✓	
Home - Computer	✓			✓	
Home - Internet	✓			✓	
Working Mother	✓			✓	
Parent Reads to Child	✓			✓	
Fluid IQ	✓			✓	
Math Score	✓	✓	✓	✓	✓
Verbal Score	✓	✓	✓	✓	✓
Science Score		✓	✓		✓
Aspiration		✓	✓		✓
Grit	✓	✓	✓	✓	✓
Gender Stereotypes	✓	✓		✓	✓
Impulsivity	✓	✓		✓	✓
Risk Attitude	✓	✓		✓	✓
Ambiguity Attitude	✓	✓		✓	✓
Critical Thinking					✓
Curiosity Survey	✓	✓	✓	✓	✓
Science Curiosity Survey		✓	✓		✓
Booklet Choice		✓			✓
Curiosity Task (WTP)		✓			✓
Knowledge Retention Score		✓	✓		✓
Network	✓	✓		✓	✓
Teacher					
Gender	✓			✓	
Age	✓			✓	
Marital Status	✓			✓	
Number of Children	✓			✓	
University Graduate	✓			✓	
Teaching Experience	✓			✓	
Fluid IQ	✓			✓	
Cognitive Empathy	✓			✓	
Gender Stereotypes	✓	✓		✓	✓
Growth Mindset	✓	✓		✓	✓
Professional Attachment	✓	✓		✓	✓
Competence Beliefs	✓	✓		✓	✓
Modern Teaching	✓	✓		✓	✓
Extrinsic Motivator	✓	✓		✓	✓
Warmth	✓	✓		✓	✓
Critical Thinking					✓
Curricular Knowledge in Science					✓
Booklet Knowledge					✓

Table B2: Balance at Baseline: Study 1

	N	Control Mean	Treatment Mean	Diff pvalue
Student Characteristics				
Male	3786	0.507	0.514	0.531
Age in Months	3786	110.887	111.564	0.465
Fluid IQ Score	3376	0.057	0.116	0.817
Math Score	3386	0.047	0.133	0.726
Verbal Score	3386	0.079	0.149	0.917
Curiosity	3786	0.098	0.106	0.896
Risk Attitude	3786	2.127	2.080	0.606
Ambiguity Attitude	2873	1.945	1.973	0.657
Gender Roles	3254	0.007	0.007	0.636
Home - Computer	3286	0.533	0.537	0.832
Home - Internet	3273	0.666	0.647	0.301
Siblingship Size	3324	2.711	2.674	0.677
Birth Order	3324	2.625	2.569	0.994
Teacher Characteristics				
Male	129	0.383	0.319	0.549
Age	129	43.050	42.188	0.392
Fluid IQ Score	129	19.133	19.174	0.997
Cognitive Empathy Score	129	22.650	22.913	0.566
Married	129	0.833	0.826	0.842
Number of children	129	1.583	1.507	0.465
Teaching experience in Years	129	18.950	18.174	0.368
University Graduate	129	0.917	0.928	0.661
Curiosity	129	-0.078	0.118	0.224
Gender Styng Beliefs	129	-0.032	-0.236	0.117
Growth Mindset	129	0.060	0.084	0.864
Professional Attachment	129	-0.081	0.146	0.176
Competence Beliefs	128	-0.003	0.206	0.183
Modern Teaching	129	-0.039	0.069	0.447
Extrinsic Motivator	129	-0.010	-0.203	0.115
Warmth	129	0.021	0.133	0.277
Classroom Characteristics				
Classroom size	129	28.200	30.348	0.330
Refugee Share	129	0.138	0.128	0.764

The table presents the balance at baseline for Study 1 sample. The p-values from the test of equality between control and treatment are shown in the last column. The p-value from joint test of student characteristics is 0.052. The p-value from joint test of teacher and classroom characteristics is 0.033. Test scores and survey items are standardized to have a mean zero and a standard deviation of 1.

Table B3: Balance at Baseline: Study 2

	N	Control Mean	Treatment Mean	Diff pvalue
Student Characteristics				
Male	9253	0.511	0.508	0.679
Age in Months	9253	113.023	113.258	0.368
Fluid IQ Score	7536	-0.048	-0.034	0.897
Math Score	7536	-0.044	-0.041	0.991
Verbal Score	7536	-0.055	-0.051	0.994
Curiosity	9253	-0.056	-0.035	0.493
Risk Attitude	9253	2.801	2.797	0.966
Ambiguity Attitude	7536	2.646	2.614	0.651
Gender Roles	7359	0.035	0.022	0.245
Home - Computer	7472	0.488	0.516	0.422
Home - Internet	7465	0.848	0.868	0.286
Siblingship Size	7490	2.747	2.744	0.997
Birth Order	7490	2.605	2.602	0.992
Teacher Characteristics				
Male	296	0.223	0.274	0.332
Age	296	46.540	45.745	0.417
Fluid IQ Score	296	17.165	17.057	0.792
Cognitive Empathy Score	296	23.219	22.958	0.583
Married	296	0.827	0.860	0.464
Number of children	296	1.914	1.803	0.269
Teaching experience in Years	296	21.892	21.529	0.726
University Graduate	296	0.950	0.962	0.620
Curiosity	296	-0.033	0.071	0.342
Gender Styling Beliefs	296	-0.054	0.030	0.511
Growth Mindset	296	-0.006	0.056	0.566
Professional Attachment	296	0.048	-0.071	0.351
Competence Beliefs	296	0.016	0.006	0.935
Modern Teaching	296	0.023	-0.007	0.708
Extrinsic Motivator	296	-0.032	-0.068	0.634
Warmth	296	-0.118	-0.108	0.943
Classroom Characteristics				
Classroom size	296	32.410	30.975	0.231
Refugee Share	296	0.035	0.039	0.737

The table presents the balance at baseline for Study 2 sample. The p-values from the test of equality between control and treatment are shown in the last column. The p-value from joint test of student characteristics is 0.280. The p-value from joint test of teacher and classroom characteristics is 0.600. Test scores and survey items are standardized to have a mean zero and a standard deviation of 1.

Table B4: Treatment Effect on the Choice of Booklet and Willingness to Pay

Panel A: Choice of Booklet			
	Science Related	Non-Science Related	No booklet
Treatment	0.038 (0.012)	-0.009 (0.011)	-0.028 (0.008)
Control Mean	0.495	0.440	0.065
Observations	10898	10898	10898
Number of Schools	134	134	134

Panel B: Willingness to Pay			
	WTP (All)	WTP (Science)	WTP (Non-Science)
Treatment	0.109 (0.039)	0.098 (0.027)	-0.009 (0.025)
Control Mean	0.000	0.000	0.000
Observations	10892	10891	10891
Number of Schools	134	134	134

Estimates are obtained via OLS. Panel A reports the estimated effects on the choice of booklet. The dependent variables are binary indicators of choosing a science-related booklet (science, space, vehicles, human body, and animals) in column 1, choosing a nonscience-related booklet (history, sports, and cartoons) in column 2, and choosing no booklet option in column 3. Panel B reports estimated effects on the task-based curiosity measure (WTP), for science WTP, and non-science WTP. The model includes the treatment status, grade and district fixed effects. Standard errors are clustered at the school level and are reported in parentheses. Asterisks indicate statistical significance at the 1% , 5% , and 10% levels.

Table B5: Treatment Effect on Knowledge Retention

	Short Term			Long Term		
	Science	Non-Science		Science	Non-Science	
	Retention	Retention	Retention	Retention	Retention	Retention
Treatment	0.116 (0.062)	0.107 (0.057)	0.082 (0.050)	0.163 (0.072)	0.185 (0.070)	0.069 (0.063)
Control Mean	-0.000	0.000	0.000	-0.000	0.000	0.000
Observations	9070	9070	9070	1336	1336	1336
Number of Schools	134	134	134	50	50	50

Panel B: Knowledge Retention (excluding Preferred Booklet)

	Short Term			Long Term		
	Science	Non-Science		Science	Non-Science	
	Retention	Retention	Retention	Retention	Retention	Retention
Treatment	0.120 (0.061)	0.110 (0.055)	0.092 (0.048)	0.197 (0.073)	0.181 (0.067)	0.136 (0.069)
Control Mean	-0.000	-0.000	-0.000	-0.000	0.000	0.000
Observations	8299	8299	8299	1219	1219	1219
Number of Schools	134	134	134	50	50	50

Estimates are obtained via OLS using the sample where the half-half regime is implemented. The dependent variables are standardized booklet test scores (knowledge retention). The first 3 columns give short-term results using the pooled sample, and the last 3 provide the long-term results of Study 1. The model includes the treatment status, grade and district fixed effects. Standard errors are clustered at the school level and are reported in parentheses.

Table B6: Treatment Effect on Subject Test Scores

	Short Term			Long Term		
	Science	Math	Verbal	Science	Math	Verbal
Treatment	0.076 (0.057)	0.012 (0.040)	0.034 (0.069)	0.091 (0.074)	0.006 (0.079)	0.010 (0.059)
Control Mean	-0.000	-0.000	0.000	0.000	0.000	0.000
Observations	9977	10433	10713	2426	2426	2426
Number of Schools	134	134	134	50	50	50

Estimates are obtained via OLS. The dependent variables are standardized subject test scores. The first 3 columns give short-term results using the pooled sample, and the last 3 provide the long-term results of Study 1. The model includes the treatment status, grade and district fixed effects. Standard errors are clustered at the school level and are reported in parentheses.

Table B7: Short term treatment effects for Study 1

Panel A: Choice of Booklet			
	Science Related	Non-Science Related	No booklet
Treatment	0.064 (0.021)	-0.029 (0.020)	-0.034 (0.017)
Control Mean	0.502	0.433	0.064
Observations	3289	3289	3289
Number of Schools	50	50	50
Panel B: Willingness to Pay			
	WTP (All)	WTP (Science)	WTP (Non-Science)
Treatment	0.221 (0.077)	0.170 (0.052)	0.010 (0.038)
Control Mean	-0.000	0.000	-0.000
Observations	3283	3282	3282
Number of Schools	50	50	50
Panel C: Knowledge Retention			
	Retention	Science Retention	Non-Science Retention
Treatment	0.161 (0.083)	0.127 (0.081)	0.146 (0.070)
Control Mean	-0.000	0.000	0.000
Observations	1752	1752	1752
Number of Schools	50	50	50
Panel D: Knowledge Retention (excluding Preferred Booklet)			
	Retention	Science Retention	Non-Science Retention
Treatment	0.123 (0.083)	0.069 (0.080)	0.143 (0.067)
Control Mean	-0.000	-0.000	-0.000
Observations	1624	1624	1624
Number of Schools	50	50	50
Panel E: Subject Test Scores			
	Science	Math	Verbal
Treatment	0.106 (0.036)	0.022 (0.061)	0.011 (0.027)
Control Mean	-0.000	0.000	-0.000
Observations	3214	3024	3304
Number of Schools	50	50	50

Estimates are obtained via OLS for short-term outcomes from Study 1 only. Panel A presents results for choosing science-related, non-science related and no booklet options. Panel B presents results for the task-based curiosity measure (WTP). Panel C presents results for the standardized booklet test scores (knowledge retention) for the half-half sample only. Panel D presents knowledge retention excluding the answers given to the preferred booklet for the half-half sample only. Panel E presents results for standardized subject test scores. Covariates, selected via post-double-selection LASSO, include gender, fluid IQ, survey measure of curiosity, refugee status, math and verbal scores as individual baseline characteristics, class size, the share of refugees, teacher experience, and the number of children the teacher has. Grade and district fixed effects included. Standard errors are clustered at the school level and are reported in parentheses.

Table B8: Short term treatment effects for Study 2

Panel A: Choice of Booklet			
	Science Related	Non-Science Related	No booklet
Treatment	0.028 (0.014)	-0.000 (0.013)	-0.027 (0.009)
Control Mean	0.492	0.443	0.065
Observations	7609	7609	7609
Number of Schools	84	84	84
Panel B: Willingness to Pay			
	WTP (All)	WTP (Science)	WTP (Non-Science)
Treatment	0.071 (0.045)	0.071 (0.029)	-0.013 (0.033)
Control Mean	-0.000	0.000	-0.000
Observations	7609	7609	7609
Number of Schools	84	84	84
Panel C: Knowledge Retention			
	Retention	Science Retention	Non-Science Retention
Treatment	0.101 (0.060)	0.096 (0.054)	0.068 (0.052)
Control Mean	0.000	0.000	-0.000
Observations	7318	7318	7318
Number of Schools	84	84	84
Panel D: Knowledge Retention (excluding Preferred Booklet)			
	Retention	Science Retention	Non-Science Retention
Treatment	0.117 (0.062)	0.112 (0.055)	0.084 (0.052)
Control Mean	0.000	-0.000	-0.000
Observations	6675	6675	6675
Number of Schools	84	84	84
Panel E: Subject Test Scores			
	Science	Math	Verbal
Treatment	0.059 (0.039)	0.005 (0.022)	0.028 (0.034)
Control Mean	0.000	-0.000	-0.000
Observations	6763	7409	7409
Number of Schools	84	84	84

Estimates are obtained via OLS for short-term outcomes from Study 2 only. Panel A presents results for choosing science-related, non-science related and no booklet options. Panel B presents results for the task-based curiosity measure (WTP). Panel C presents results for the standardized booklet test scores (knowledge retention) for the half-half sample only. Panel D presents knowledge retention excluding the answers given to the preferred booklet for the half-half sample only. Panel E presents results for standardized subject test scores. Covariates, selected via post-double-selection LASSO, include gender, fluid IQ, survey measure of curiosity, refugee status, math and verbal scores as individual baseline characteristics, class size, the share of refugees, teacher experience, and the number of children the teacher has. Grade and district fixed effects included. Standard errors are clustered at the school level and are reported in parentheses.

Table B9: Predictive Validity of Curiosity (WTP) Measure

Panel A: WTP (All)			
	Science	Math	Verbal
WTP (All)	0.028 (0.019)	0.011 (0.012)	0.024 (0.018)
Fluid IQ	0.395 (0.026)	0.177 (0.017)	0.464 (0.017)
Grit	0.055 (0.020)	0.025 (0.013)	0.101 (0.021)
Impulsivity	-0.036 (0.017)	0.016 (0.012)	-0.139 (0.016)
Risk	-0.007 (0.025)	0.015 (0.016)	-0.019 (0.022)
Ambiguity	0.006 (0.026)	0.021 (0.017)	-0.017 (0.023)
Critical Thinking	0.060 (0.022)	0.015 (0.013)	0.075 (0.019)
Panel B: WTP (Science)			
	Science	Math	Verbal
WTP (Science)	0.065 (0.018)	0.011 (0.013)	0.050 (0.015)
Fluid IQ	0.394 (0.026)	0.177 (0.016)	0.463 (0.017)
Grit	0.055 (0.020)	0.025 (0.013)	0.102 (0.021)
Impulsivity	-0.033 (0.017)	0.017 (0.012)	-0.137 (0.016)
Risk	-0.005 (0.025)	0.017 (0.016)	-0.017 (0.021)
Ambiguity	0.005 (0.025)	0.021 (0.017)	-0.017 (0.023)
Critical Thinking	0.057 (0.022)	0.014 (0.013)	0.072 (0.019)
Panel C: WTP (Non-Science)			
	Science	Math	Verbal
WTP (Non-Science)	-0.044 (0.019)	-0.003 (0.012)	-0.032 (0.015)
Fluid IQ	0.398 (0.026)	0.178 (0.016)	0.466 (0.017)
Grit	0.059 (0.020)	0.026 (0.013)	0.104 (0.021)
Impulsivity	-0.034 (0.017)	0.017 (0.012)	-0.137 (0.016)
Risk	0.003 (0.025)	0.018 (0.016)	-0.011 (0.021)
Ambiguity	0.008 (0.025)	0.022 (0.017)	-0.015 (0.023)
Critical Thinking	0.058 (0.022)	0.014 (0.012)	0.073 (0.019)
Observations	2797	2797	2797

The table presents OLS coefficients from the regression of test scores on the willingness to pay for a booklet (overall WTP in panel A, science WTP in panel B and non-science WTP in panel C), fluid IQ, grit, impulsivity, risk and ambiguity tolerance, and critical thinking. Risk and ambiguity tolerance is measured via incentivized tasks. Other skills are measured via item-response questionnaires. All measures are standardized. The analysis uses only the control sample. Standard errors are clustered at the classroom level and are reported in parentheses.

Table B10: Associations Between Curiosity Task (WTP) and SES & Demographic Indicators

	WTP (All)	WTP (Science)	WTP (Non-Science)	Observations
Working Mother	0.072 (1.93)	0.090 (2.68)	-0.032 (0.98)	4397
Home - Computer	0.026 (0.78)	0.082 (2.66)	-0.062 (2.19)	4404
Home - Internet	0.054 (1.27)	0.024 (0.58)	0.021 (0.55)	4395
Parent Reads to Child	0.072 (1.97)	0.064 (2.03)	-0.007 (0.22)	4401
Siblingship Size	-0.010 (1.29)	-0.005 (0.77)	-0.003 (0.39)	4427
Birth Order	-0.003 (0.29)	0.001 (0.08)	-0.003 (0.32)	4427
Male	0.123 (4.23)	0.021 (0.68)	0.081 (2.53)	5097
Age in Months	0.001 (0.33)	0.002 (0.81)	-0.001 (0.51)	5097

The table presents OLS coefficients of the regression of WTP on various socioeconomic status and demographic indicators. The former includes binary indicators of a working mother, a computer at home, internet access at home, and whether parents read to the child. The analysis uses only the control sample. Standard errors are clustered at the classroom level and are reported in parentheses.

Table B11: Treatment Effect on Knowledge Retention through Information Dissemination

Panel A: Booklet Received			
	Retention	Science Retention	Non-Science Retention
Treatment	0.151 (0.057)	0.130 (0.053)	0.121 (0.050)
Wild Bootstrap P-Value	0.005	0.013	0.024
Control Mean	0.000	-0.000	-0.000
Observations	4217	4217	4217
Number of Schools	134	134	134
Panel B: No Booklet Received			
	Retention	Science Retention	Non-Science Retention
Treatment	0.076 (0.052)	0.066 (0.046)	0.060 (0.046)
Wild Bootstrap P-Value	0.171	0.170	0.235
Control Mean	0.020	0.014	0.020
Observations	4725	4725	4725
Number of Schools	134	134	134
Panel C: Network Effect			
	Retention	Science Retention	Non-Science Retention
Treatment	0.163 (0.081)	0.133 (0.075)	0.140 (0.074)
Wild Bootstrap P-Value	0.055	0.094	0.078
Control Mean	0.028	0.016	0.034
Observations	947	947	947
Number of Schools	134	134	134

Estimates are obtained via OLS. The dependent variables are standardized booklet test scores (knowledge retention). Panel A uses the sample of booklet recipients only in the half-half regime. Panel B uses the sample of students who did not receive a booklet in the half-half regime. Panel C uses the sample of students who did not receive a booklet but have at least one person in their network who has received the booklet of their choice in the half-half regime. Covariates, selected via post-double-selection LASSO, include gender, fluid IQ, survey measure of curiosity, refugee status, math and verbal scores as individual baseline characteristics, class size, the share of refugees, teacher experience, and the number of children the teacher has. Grade and district fixed effects included. Standard errors are clustered at the school level and are reported in parentheses.

Table B12: Balance at Baseline for Table 6 Panel C (Network Effects)

	N	Control Mean	Treatment Mean	Diff pvalue
Male	1207	0.498	0.499	0.817
Age in Months	1207	111.647	111.967	0.508
Fluid IQ Score	1100	0.112	0.100	0.657
Math Score	1101	0.146	0.100	0.403
Verbal Score	1101	0.163	0.130	0.489
Curiosity	1207	0.023	0.042	0.917
Risk Attitude	1207	2.512	2.557	0.293
Ambiguity Attitude	1049	2.388	2.470	0.205
Gender Roles	1079	-0.001	0.017	0.144
Home - Computer	1087	0.514	0.506	0.774
Home - Internet	1081	0.802	0.818	0.320
Siblingship Size	1090	2.539	2.598	0.585
Birth Order	1090	2.531	2.465	0.743

The table presents the balance at baseline for the restricted sample described in Table 6 Panel C. The sample contains students who did not receive any booklet but have at least one person in their network who has received the booklet of their choice. The p-values from the test of equality between control and treatment are shown in the last column.

Table B13: Heterogeneous Treatment Effects - IQ

Panel A: Choice of Booklet			
	Science Related	Non-Science Related	No booklet
Treatment = Low IQ	0.026 (0.017)	0.008 (0.015)	-0.034 (0.011)
Treatment = High IQ	0.047 (0.014)	-0.021 (0.014)	-0.025 (0.008)
P-Value : Low = High	0.318	0.121	0.379
Control Mean - Low IQ	0.480	0.449	0.071
Control Mean - High IQ	0.505	0.435	0.061
Observations	10898	10898	10898
Number of Schools	134	134	134

Panel B: Willingness to Pay			
	WTP (All)	WTP (Science)	WTP (Non-Science)
Treatment = Low IQ	0.062 (0.048)	0.046 (0.039)	0.005 (0.032)
Treatment = High IQ	0.140 (0.043)	0.132 (0.031)	-0.019 (0.031)
P-Value : Low = High	0.070	0.057	0.527
Control Mean - Low IQ	-0.047	-0.039	0.002
Control Mean - High IQ	0.029	0.025	-0.001
Observations	10892	10891	10891
Number of Schools	134	134	134

Estimates are obtained via OLS. Panel A reports the estimated effects on the choice of a booklet. The dependent variables are binary indicators of choosing a science-related booklet (science, space, vehicles, human body, and animals) in column 1, choosing a nonscience-related booklet (history, sports, and cartoons) in column 2, and choosing no booklet option in column 3. Panel B reports estimated effects on the WTP for a booklet, WTP for a science-related booklet, and WTP for a non-science booklet. Covariates, selected via post-double-selection LASSO, include gender, fluid IQ, survey measure of curiosity, refugee status, math and verbal scores as individual baseline characteristics, class size, the share of refugees, teacher experience, and the number of children the teacher has. Grade and district fixed effects included. Standard errors are clustered at the school level and are reported in parentheses.

Table B14: Heterogeneous Treatment Effects - IQ

Panel A: Knowledge Retention						
	Short Term			Long Term		
	Science Retention	Non-Science Retention	Non-Science Retention	Science Retention	Non-Science Retention	Non-Science Retention
Treatment = Low IQ	0.073 (0.044)	0.049 (0.043)	0.077 (0.039)	0.020 (0.062)	0.015 (0.065)	0.018 (0.082)
Treatment = High IQ	0.144 (0.068)	0.138 (0.061)	0.095 (0.058)	0.216 (0.098)	0.252 (0.093)	0.084 (0.085)
P-Value : Low = High	0.260	0.142	0.742	0.096	0.066	0.550
Control Mean - Low IQ	-0.120	-0.127	-0.062	-0.105	-0.108	-0.059
Control Mean - High IQ	0.076	0.081	0.039	0.080	0.083	0.046
Observations	9070	9070	9070	1336	1336	1336
Number of Schools	134	134	134	50	50	50

Panel B: Knowledge Retention (excluding Preferred Booklet)						
	Short Term			Long Term		
	Science	Math	Verbal	Science	Math	Verbal
Treatment = Low IQ	0.088 (0.046)	0.061 (0.044)	0.096 (0.040)	0.086 (0.071)	0.046 (0.072)	0.111 (0.104)
Treatment = High IQ	0.142 (0.070)	0.134 (0.062)	0.101 (0.057)	0.227 (0.094)	0.229 (0.085)	0.127 (0.086)
P-Value : Low = High	0.407	0.238	0.939	0.245	0.143	0.901
Control Mean - Low IQ	-0.099	-0.108	-0.048	-0.107	-0.104	-0.076
Control Mean - High IQ	0.063	0.068	0.030	0.082	0.080	0.058
Observations	8299	8299	8299	1219	1219	1219
Number of Schools	134	134	134	50	50	50

Estimates are obtained via OLS using the sample where the half-half regime is implemented. The dependent variables are standardized booklet test scores (knowledge retention). The first 3 columns give short-term results using the pooled sample, and the last 3 provide the long-term results of Study 1. Covariates for the short-term specification, selected via post-double-selection LASSO, include gender, fluid IQ, survey measure of curiosity, refugee status, math and verbal scores as individual baseline characteristics, class size, the share of refugees, teacher experience, and the number of children the teacher has. The long-term covariate set, selected via post-double-selection LASSO, is similar but excludes class size and refugee share. Grade and district fixed effects included. Standard errors are clustered at the school level and are reported in parentheses.

Table B15: Heterogeneous Treatment Effects - IQ

	Short Term			Long Term		
	Science	Math	Verbal	Science	Math	Verbal
Treatment = Low IQ	0.066 (0.033)	0.013 (0.043)	0.057 (0.029)	0.032 (0.059)	-0.126 (0.059)	-0.004 (0.077)
Treatment = High IQ	0.082 (0.044)	0.018 (0.038)	0.019 (0.036)	0.093 (0.054)	0.050 (0.059)	-0.033 (0.053)
P-Value : Low = High	0.770	0.927	0.322	0.422	0.049	0.757
Control Mean - Low IQ	-0.351	-0.199	-0.428	-0.323	-0.337	-0.211
Control Mean - High IQ	0.217	0.124	0.268	0.209	0.218	0.136
Observations	9977	10433	10713	2426	2426	2426
Number of Schools	134	134	134	50	50	50

Estimates are obtained via OLS. The dependent variables are standardized subject test scores. The first 3 columns give short-term results using the pooled sample, and the last 3 provide the long-term results of Study 1. Standard errors are clustered at the school level and are reported in parentheses. Covariates for the short-term specification, selected via post-double-selection LASSO, include gender, fluid IQ, survey measure of curiosity, refugee status, math and verbal scores as individual baseline characteristics, class size, the share of refugees, teacher experience, and the number of children the teacher has. The long-term covariate set, selected via post-double-selection LASSO, is similar but excludes class size and refugee share. Grade and district fixed effects included.

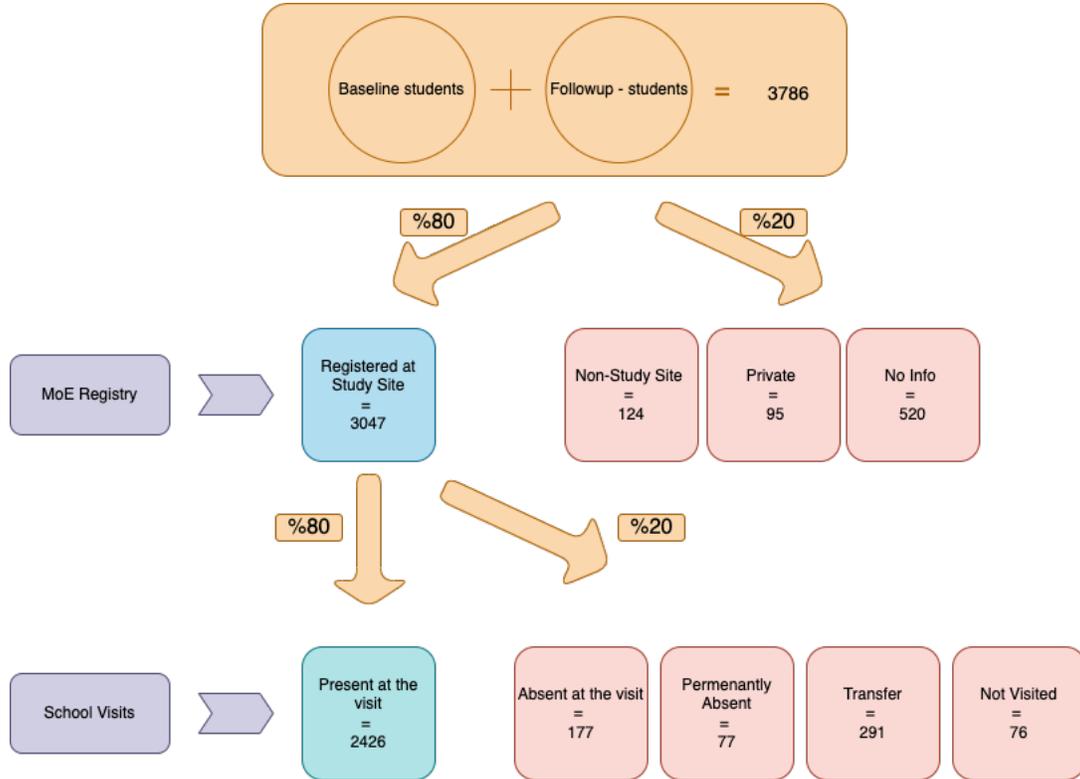
Table B16: Heterogeneous Treatment Effects - IQ

Panel A: Short Term					
	University	Science	Engineering	Medical	Non-STEM
Treatment = Low IQ	0.007 (0.009)	0.015 (0.012)	0.005 (0.011)	0.007 (0.011)	-0.028 (0.016)
Treatment = High IQ	0.009 (0.005)	0.027 (0.008)	-0.002 (0.009)	-0.008 (0.010)	-0.017 (0.014)
P-Value : Low = High	0.862	0.440	0.562	0.300	0.582
Control Mean - Low IQ	0.937	0.121	0.104	0.139	0.636
Control Mean - High IQ	0.958	0.111	0.127	0.175	0.587
Observations	10721	10212	10212	10212	10212
Number of Schools	134	134	134	134	134
Panel B: Long Term					
	University	Science	Engineering	Medical	Non-STEM
Treatment = Low IQ	0.017 (0.015)	0.002 (0.027)	0.004 (0.024)	-0.018 (0.027)	0.012 (0.035)
Treatment = High IQ	0.003 (0.010)	0.018 (0.025)	0.019 (0.020)	-0.009 (0.022)	-0.028 (0.030)
P-Value : Low = High	0.413	0.647	0.601	0.807	0.390
Control Mean - Low IQ	0.919	0.135	0.078	0.219	0.569
Control Mean - High IQ	0.969	0.125	0.140	0.213	0.522
Observations	2320	2182	2182	2182	2182
Number of Schools	50	50	50	50	50

Estimates are obtained via OLS. The dependent variables are binary choice variables of intention to go to university, intention to choose a science major, engineering major, medicine, and non-STEM major. Panel A presents short-term results from the pooled sample, and Panel B long-term results from Study 1. Covariates for the short-term specification, selected via post-double-selection LASSO, include gender, fluid IQ, survey measure of curiosity, refugee status, math and verbal scores as individual baseline characteristics, class size, the share of refugees, teacher experience, and the number of children the teacher has. The long-term covariate set, selected via post-double-selection LASSO, is similar but excludes class size and refugee share. Grade and district fixed effects included. Standard errors are clustered at the school level and are reported in parentheses.

B Additional Figures

Figure B1: The Attrition Pattern of Study 1

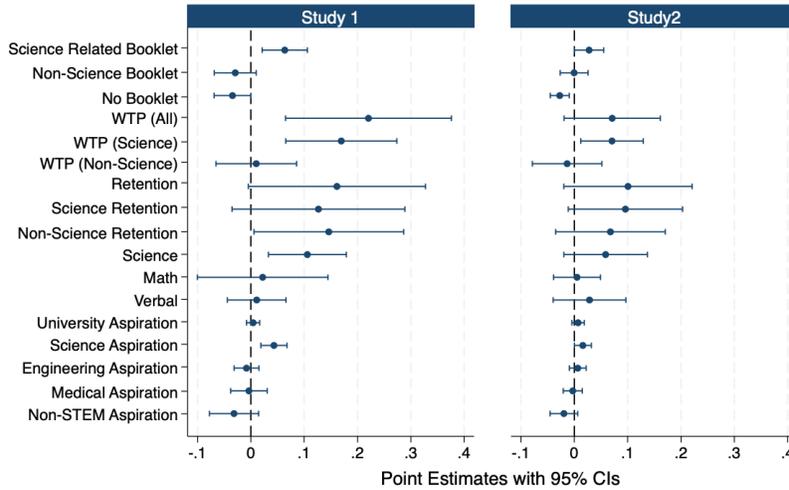


The figure depicts the pattern and the reason for attrition in Study 1 during the long-term data collection. The Turkish Ministry of Education was able to locate 80% of our original participants in its official database. “Non-Study Site” refers to students who left the province of Mersin, “Private” refers to those who left the public education system for a private school, and “No Info” refers to those considered missing. Among the officially registered in Mersin, a total of 177 students were absent during our visit for various usual reasons such as illness. A total of 77 students were declared permanently absent (never showed up) by school administrators, 291 were reported to have transferred to another school, and 76 students were dispersed too far for us to go after.

Figure B2: Covers of the Booklets

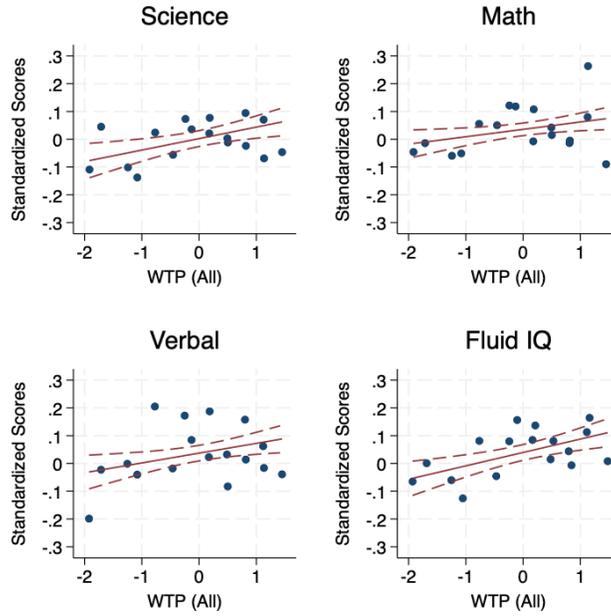


Figure B3: Treatment Effects -by Study Sites



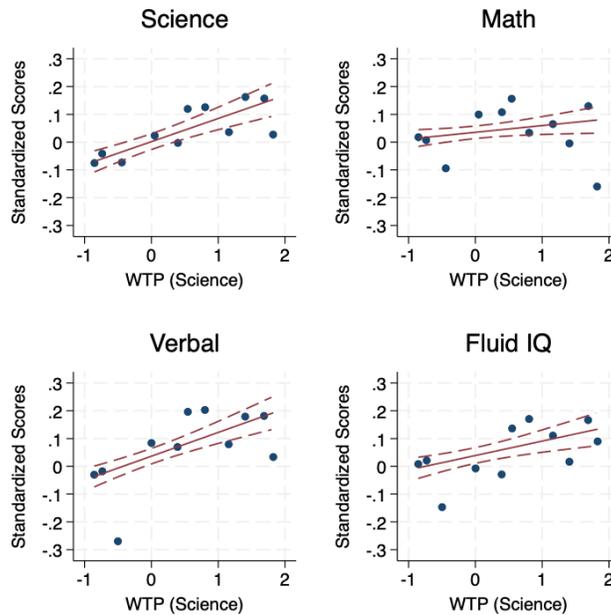
The figure depicts the estimated treatment effects and their 95% confidence intervals for all outcomes considered in the study. The vertical line indicates a treatment effect of 0. The first three outcomes are the choice of booklets, the following three are curiosity (WTP) based on the experimental task, followed by the booklet performance (7-9), subject test scores (10-12), and educational aspirations (13-17). Covariates, selected via post-double-selection LASSO, include gender, fluid IQ, survey measure of curiosity, refugee status, math and verbal scores as individual baseline characteristics, class size, the share of refugees, teacher experience, and the number of children the teacher has. Grade and district fixed effects included. Standard errors are clustered at the school level.

Figure B4: Associations with WTP and Cognitive Outcomes



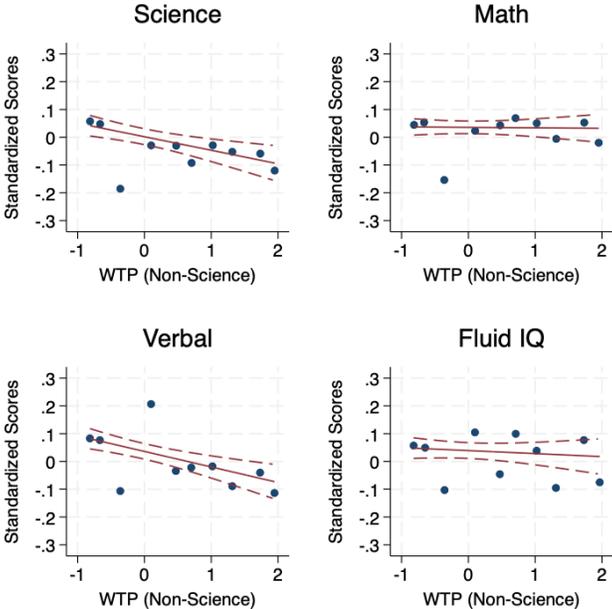
Figures depict the relationship between willingness to pay measured by the number of tokens forgone for a booklet and test scores using only the control sample.

Figure B5: Associations with Science WTP and Cognitive Outcomes



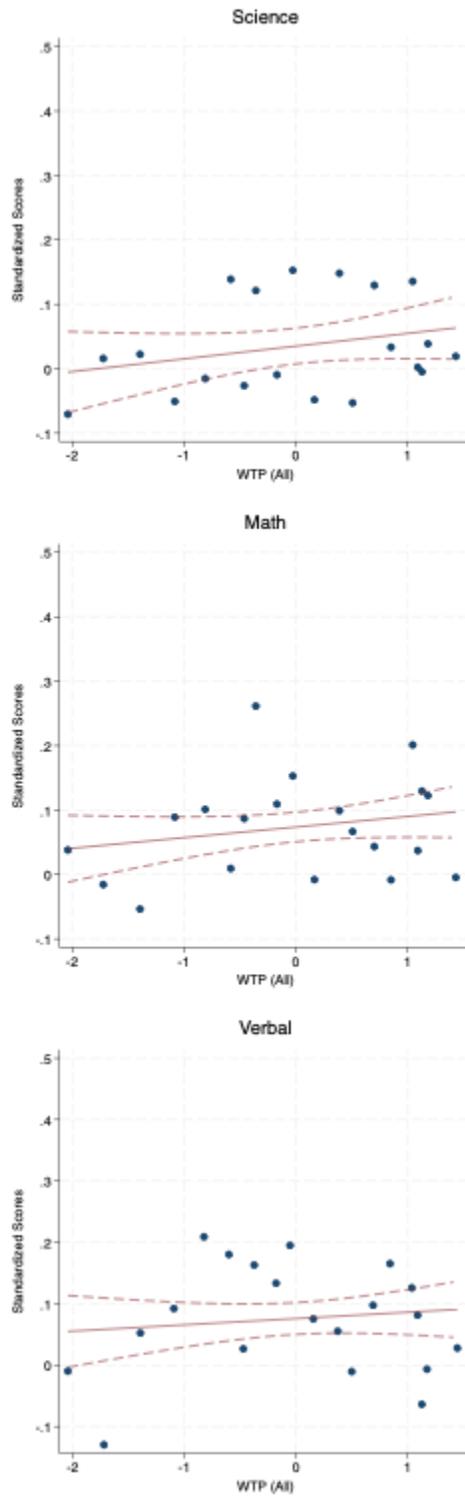
Figures depict the relationship between willingness to pay measured by the number of tokens forgone for a science-related booklet and test scores using only the control sample.

Figure B6: Associations with Non-science WTP and Cognitive Outcomes



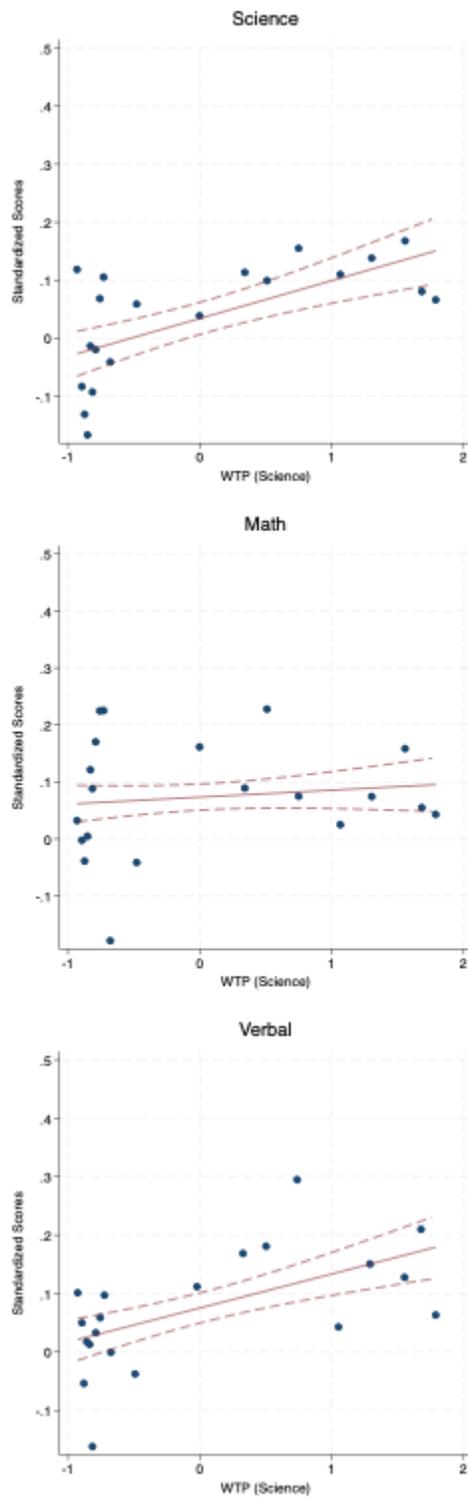
Figures depict the relationship between willingness to pay measured by the number of tokens forgone for a non science-related booklet and test scores using only the control sample.

Figure B7: Associations with WTP and Cognitive Outcomes controlling for Fluid IQ



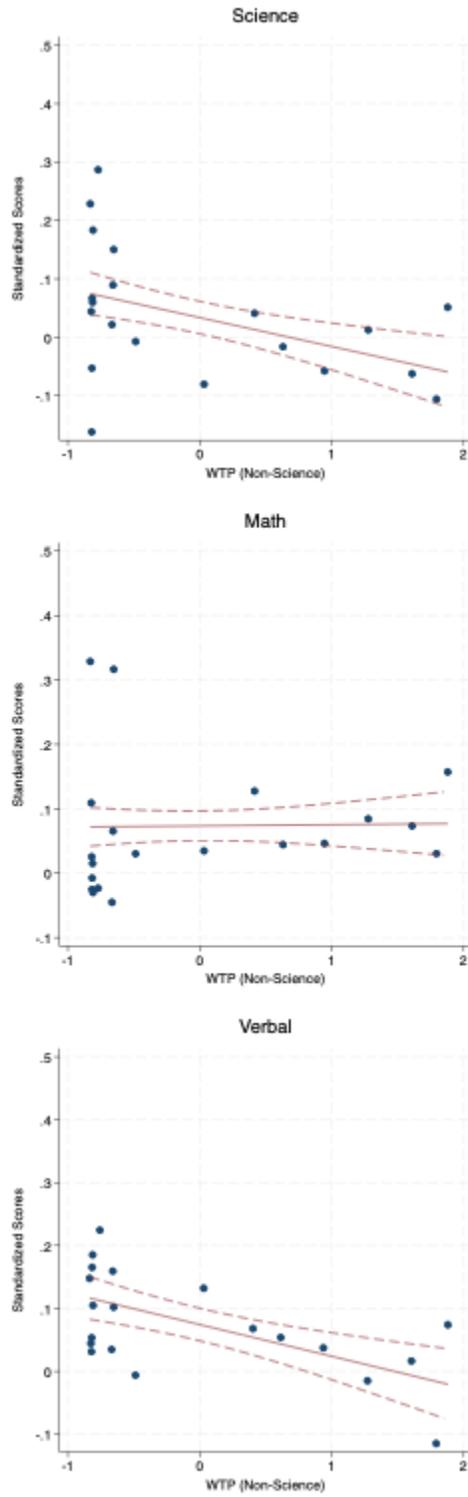
Figures depict the relationship between willingness to pay measured by the number of tokens forgone for a booklet and test scores after controlling for student's fluid IQ and using only the control sample.

Figure B8: Associations with Science WTP and Cognitive Outcomes controlling for Fluid IQ



Figures depict the relationship between willingness to pay measured by the number of tokens forgone for a science-booklet and test scores after controlling for student's fluid IQ and using only the control sample.

Figure B9: Associations with Non-science WTP and Cognitive Outcomes controlling for Fluid IQ



Figures depict the relationship between willingness to pay measured by the number of tokens forgone for a non science-booklet and test scores after controlling for student's fluid IQ and using only the control sample.

C Implementation Items and Moments

Figure B10: Curious Classroom Toolkit



Figure B11: Creating Teachable Moments via Humor, Mystery and Astonishment

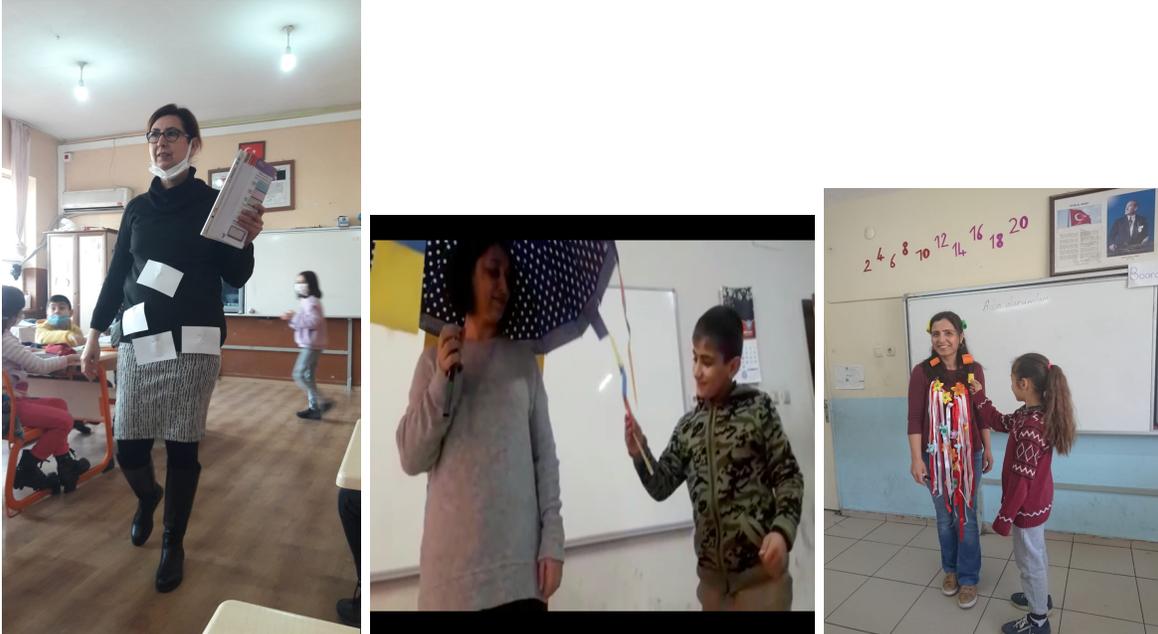


Figure B12: Examples of Children's Activities (Mystery Box)



D Instructions for Incentivized Games

D.1 Curiosity Task

Hi everybody. We will play some fun games with you today. By playing these games, you will have a chance to earn gift tokens from us, with which you can get any gift you want from our gift bag [show the items in the gift bag]. The number of gifts you will receive will depend on your choices in these games. To get the gifts, you need to collect tokens, as each gift in our basket has a different token value. The more tokens you have, the more gifts you will be able to get at the end of our visit.

Each game has its own rules, and we will slowly explain all of them. But our main rule is discretion. You will need to make all our choices discretely, without showing anyone. Do

you understand this rule? Excellent!

Now, see that we brought 8 booklets to you today. These booklets contain some incredible facts that most people do not know. [Start introducing them one by one]. This is the Space booklet. It has shocking facts in it. [Show animals], this is a booklet that contains astonishing facts about animals. [Go through each booklet in the same manner and always in the same order].

Now, we would like you to rank the booklets from most attractive to the least according to your own taste. Please type 1 beside the picture of the booklet that interests you the most, 2 for the second most interesting you find, and keep going until 8, which would be the booklet least interesting to you. [Make sure everyone finishes their ranking and press continue before the next step].

Now, if you want, you can purchase one (and only one) of these booklets from us. How? Well, first, know that we are giving all of you 10 tokens. All of you have 10 tokens. You can use these tokens to get some of these nice stationery items from us. You can also get one booklet if you want. You don't have to get a booklet. You can convert all your tokens to gift items if you wish to. [Make sure children understand they do not have to purchase a booklet]. But if you do want a booklet, you need to first indicate which booklet you want to purchase on your tablet. Then you need to indicate how many of those 10 tokens you would be willing to give us back to purchase this booklet. You can say zero, meaning you don't want a booklet and want to convert all your tokens into gifts. Or you can say any number from 1 to 10.

But how do you really purchase a booklet? One of two things can happen in your classroom. You can be classroom type A or B. Let's see what happens in type A classrooms: Let's say student A decides to forgo 3 tokens, student B 5, and student C 7 tokens. Here is what we will do. We will pick a number from this bag. The bag contains folded little papers. In each paper, a number between 1 to 10 is written. [Show the black bag and show the little paper pieces]. The number we pull from this bag will be the price of a booklet for this classroom.

[Now, start giving the examples based on the 3 students above]. Let's say we picked number 8. Then we will look at everyone's decision of willingness to pay for their preferred booklet. Student A marks 3. She can't get the booklet she wants because the price is 8. Instead, we will convert all her 10 tokens into gifts. The same goes for students B and C because their willingness to pay fell under the price of the booklet in this classroom.

But let's say we pick the number 5 instead of 8, so the price is 5. Student A still won't get a booklet and will receive 10 tokens worth of gifts. Student B, however, will give us her 5 tokens, get the booklet she wants and convert her remaining 5 tokens into gifts. What about student C? Well, she says she is willing to forgo 7 tokens but does she need to? NO. The price is 5, why should she? So we will get 5 tokens from her, give her the booklet she wants, and she will convert the remaining 5 tokens to gifts, just like student B.

What about a student who states zero willingness to pay? Well, she will not receive a booklet at any price. What about a student who states 10? She will certainly receive a

booklet in the classroom type A.

What if your classroom is type B, which is much more likely as most classrooms will be type B. If your classroom is a type B, no matter how much you are willing to pay for a booklet, and no matter which booklet you prefer, a random half of the classroom will receive booklets, and the other half will not. We will pick half the students randomly from your class list.

Now, time to make decisions. First, tap the booklet you want to purchase. Don't forget there is an option that says "I do not want a booklet". You can tap that if you don't want a booklet. After making your choice, please tap the number of tokens you are willing to forgo to get the booklet you choose. [Make sure everyone makes their decisions and press continue.]

- Implementation, Type A (Market Price): Please pick a number from the black bag. Distribute the booklets accordingly.
- Implementation Type B (Half-Half): Please select the random half of the classroom using the class list and distribute the booklets only to them. Make sure every classroom has all 8 booklets.

D.2 Risk and Ambiguity Games

Now we will play two games. [Type Game 1 and Game 2 on the board]. These two games are almost identical to each other. You will earn some gifts from these games. But you will collect the gifts from only one of the games, i.e., the gifts will not accumulate. We will pick one of these two games randomly for this classroom at the end of the visit, and you will get your gifts based on the decisions you make for that game. Now, let me explain the games. Game 1: We will give you 5 tokens for this game. You can convert these tokens into small gifts in our bag [show all the gifts]. Now, think about a bucket [draw a bucket on the board]. You can put some of your tokens in this bucket if you want. You don't have to. If you don't, you have your 5 tokens, no problem. But what happens if you put some of your tokens in the bucket? Then, you draw a ball from this black bag [show the black bag]. There are two balls in this bag. One is yellow, and one is purple [show the balls]. The tokens you put in the bucket triple if you draw the yellow ball. You lose all the tokens you put in the bucket if you draw the purple ball. But not the ones you didn't put in the bucket. Tokens you don't put in the bucket are always safe.

Let's see some examples now: If you put none of your tokens in the bucket. What happens? NOTHING. You have 5 tokens. Let's say you put 1 token in the bucket. You have 4 safe ones left. Nothing happens to them. Then you draw a ball from the bag. If you draw the yellow ball, your 1 token becomes 3 tokens. Add to that your 4 safe ones. You now have 7 tokens. But what if you pick the purple ball. Then you lose that 1 token you put in the bucket, and you have 4 tokens. Now, let's say you put 2 tokens in the bucket. [Go on until you give the example of 5 tokens].

Now, decide how many tokens you want to put in the bucket. Please tap the number on your tablet and press continue.

Game 2: Now, we will play the second game. The second game is the same as the first game. You have 5 tokens, there is a bucket, and the tokens you put in the bucket triple if the yellow ball is drawn. They disappear if the purple ball is drawn. All the same. Except now, you don't know the colors of the balls in this new bag [pick the other bag, so children see this is not the same bag as in game 1]. Both balls can be yellow. In that case, you certainly win. Both balls can be purple, in which case you certainly lose. Or, one of them may be yellow, the other purple, as in Game 1. The fact is, you do not know.

Now, please decide how many tokens you will put in the bucket. Please tap the number on your tablet and press continue.

E Survey Inventories

We provide some example questions from our student and teacher surveys below. The full inventory for both is available upon request.

Table B17: Student Survey Inventories

Inventory	Exemplary Items
<i>4-point likert scale: completely agree, agree, disagree, completely disagree</i>	
Curiosity	There are always questions on my mind.
	When I hear a word that I do not know, I am eager to learn it.
Scientific Curiosity	It is fun to break things into pieces to see what is inside.
	I never hesitate to ask questions.
Grit	Obstacles or setbacks may discourage me.
	I often set a goal but later choose to pursue a different one.
Impulsivity	I tend to say the first thing that comes to mind, without thinking about it.
	I interrupt people when they are talking.
Critical Thinking	It's important to understand other people's viewpoint on an issue.
	I usually check the credibility of the source of information before making judgements.

Table B18: Teacher Survey Inventories

Inventory	Exemplary Items
<i>4-point likert scale: completely agree, agree, disagree, completely disagree</i>	
Teaching Styles	I encourage my students to do research on topics they are interested in and discuss these topics with me. (Inquiry-based Pedagogy)
	It does not matter if there is noise in the classroom as long as the students are busy with something productive. (Modern Teaching)
	Punishment is necessary to create a disciplined class. (Extrinsic Motivation)
	Teachers should be serious and authoritative in their relationships with students. (Warmth)
Professional Satisfaction	I am very pleased to have chosen teaching as a profession.
Competence	It is difficult for me to communicate effectively with students.

Growth Mindset	Your intelligence is something that you can't change very much.
Critical Thinking	I sometimes find a good argument that challenges some of my firmly held beliefs.
Gender Stereotyping	Men have better judgment compared to women; hence they are better leaders.