

Engineering role models in Instagram: experimental evidence for Peru

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Introduction

- In Peru, and around the world, there is a wide gap in the participation of women in STEM careers, particularly in engineering:
 - Less than 1 in 5 women who apply for college choose engineering careers (while 1 in 2 men apply for engineering).
- This has consequences for women and society in general: effects on income distribution, talent allocation, and impacts on new ideas, science, technology, and overall economic development.

Introduction

- Main factors behind this participation gap are self-perception and self-efficacy:
 - Women perceive that engineering is a male domain and that they do not have the necessary capabilities to pursue studies in this field (UNESCO, 2017).
- Girls lose interest in engineering careers from a very early age (Card, 2017).

Introduction

- Recently, interventions have been conducted around the world aiming to influence perceptions of high school girls to pursue STEM careers.
- Role model interventions and external signals (regarding mathematical competence) seem to be effective in influencing these perceptions, but only among high-achieving math girls (Breda et al, 2023; Agurto et al, 2022; Porter & Serra, 2020).
- Can these role models be effective through social network channels? Higher reach and, maybe, less costly.
- There is no relevant evidence on interventions that also aim to influence the environment of school-aged girls: teachers and parents, who play an important role in shaping girls' preferences and decisions regarding university careers.

In this project ...

- Based on a baseline survey conducted in 75 schools in northern Peru, we aim to understand students majors preferences and factors influencing them.
- Secondly, we evaluate a low-cost, highly replicable experimental intervention where treated students were invited to follow a role model account on Instagram, designed and operated by young engineering students.
- In part of the treatment group, informational videos about biases related to women's participation in engineering careers were also shared with school tutors.

Baseline survey findings (N=792)

Table 1 – Preferences for Engineering Career and Self-Perception of Capabilities to Pursue Engineering Studies

	I	II	III	IV
	Mean Girls	Mean Boys	G - B	G – B conditioning on math performance: M – V
Student prefers engineering (yes=1)	0.139 (0.032)	0.346 (0.030)	-0.207***	-0.199***
Completely confident in having the necessary capabilities to study industrial engineering (yes=1)	0.110 (0.027)	0.203 (0.024)	-0.093***	-0.077***
Completely confident in having the necessary capabilities to study mechanical engineering (yes=1)	0.060 (0.032)	0.174 (0.029)	-0.114***	-0.104***
Completely confident in belonging to the top 50% in mathematical performance (yes=1)	0.300 (0.043)	0.500 (0.036)	-0.200***	-0.161***

Baseline survey findings (N=792)

Table 2: Careers that Students Recommend to High-Performing Math Students, by Gender

	I	II	III
	Mean Girls	Mean Boys	G - B
Recommends engineering to at least one female student among the top three math students in class	0.339 (0.055)	0.186 (0.033)	0.153***
Recommends engineering career to at least one male student among the top three math students in class	0.385 (0.064)	0.581 (0.043)	-0.196***

Baseline survey findings (N=792)

Table 3: Preferences, Recommendations, and Expectations of Parents and Teachers from the Perspective of Students

	I	II	III
	Mean Girls	Mean Boys	G - B
Professor has recommended engineering	0.147 (0.036)	0.358 (0.033)	-0.211***
Mother expects student to major in engineering	0.129 (0.029)	0.303 (0.026)	-0.174***
Father expects student to major in engineering	0.185 (0.033)	0.361 (0.032)	-0.176*

Baseline survey findings

- While 1 in 3 senior high school boys want to become engineers, only 1 in 7 girls share that aspiration.
- Engineering is clearly perceived as a male domain, and female students feel they lack the skills and aptitude to pursue such studies.
- While 1 in 3 boys indicate that their teachers and/or parents expect them to become engineers, on average, only 1 in 6 girls report the same.

Role models Instagram intervention

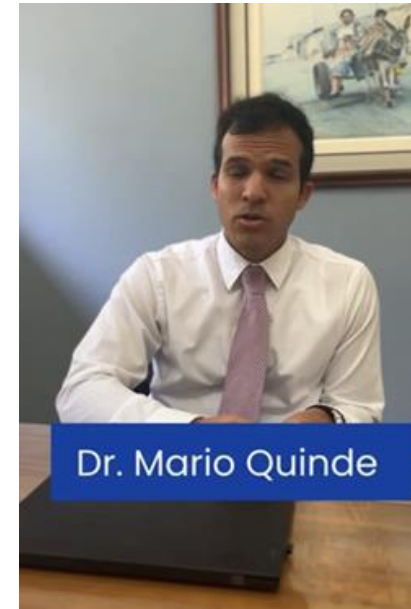
Instagram account



Role models videos



Videos for school tutor



Schedule

July 2023	August 2023	September 2023	October 2023	November 2023	December 2023	March to July 2024
Baseline survey						
	Preparation of Instagram account and videos					
		Intervention rollout				
			First follow up			
					Small grants draft	
						Students enrollment decisions (SUNEDU)

Preliminary results – all girls

	Control Mean	Treatment - Control	T1 - Control	T2 - Control
Student follows the account on Instagram (yes=1)	0.000	0.327***	0.320***	0.334***
	(0.000)	(0.027)	(0.038)	(0.034)
Student prefers engineering major (yes=1)	0.178	-0.082**	-0.072	-0.089**
	(0.033)	(0.041)	(0.048)	(0.039)
Student participates in the raffle for a small scholarship in engineering major (yes=1)	0.121	0.010	-0.014	0.031
	(0.032)	(0.036)	(0.040)	(0.039)

Preliminary results – high math performance girls

	Control Mean	Treatment - Control	T1 - Control	T2 - Control
Student follows the account on Instagram (yes=1)	0.000	0.377***	0.277***	0.521***
	(0.000)	(0.065)	(0.083)	(0.102)
Student prefers engineering major (yes=1)	0.275	0.039	0.062	-0.000
	(0.075)	(0.121)	(0.123)	(0.179)
Student participates in the raffle for a small scholarship in engineering major (yes=1)	0.069	0.179*	0.112	0.276**
	(0.053)	(0.095)	(0.114)	(0.108)

Preliminary results – low math performance girls

	Control Mean	Treatment - Control	T1 - Control	T2 - Control
Student follows the account on Instagram (yes=1)	0.000	0.320***	0.329***	0.312***
	(0.000)	(0.030)	(0.042)	(0.035)
Student prefers engineering major (yes=1)	0.153	-0.086*	-0.087	-0.086*
	(0.042)	(0.050)	(0.054)	(0.051)
Student participates in the raffle for a small scholarship in engineering major (yes=1)	0.135	-0.017	-0.035	-0.003
	(0.034)	(0.0)	(0.040)	(0.042)

Mechanisms? Full girls sample

	Control Mean	Treatment - Control	T1 - Control	T2 - Control
Student considers she has necessary aptitude to study industrial engineering (yes=1)	0.186	-0.019	-0.009	-0.027
	(0.033)	(0.034)	(0.039)	(0.034)
Students recommends engineering to a top performance math girl in class (yes=1)	0.350	0.064	0.069	0.061
	(0.061)	(0.077)	(0.104)	(0.070)
Tutor has recommended engineering to her (yes=1)	0.278	0.003	-0.008	0.013
	(0.034)	(0.045)	(0.049)	(0.051)
Mother wants student to major in engineering (yes=1)	0.136	-0.031	-0.032	-0.034
	(0.022)	(0.031)	(0.033)	(0.033)

Mechanisms? High math performance girls

	Control Mean	Treatment - Control	T1 - Control	T2 - Control
Student considers she has necessary aptitude to study industrial engineering (yes=1)	0.310	0.042	0.127	-0.083
	(0.096)	(0.116)	(0.129)	(0.143)
Students recommends engineering to a top performance math girl in class (yes=1)	0.413	0.086	0.139	0.006
	(0.091)	(0.151)	(0.180)	(0.144)
Tutor has recommended engineering to her (yes=1)	0.448	0.132	0.108	0.167
	(0.054)	(0.087)	(0.096)	(0.122)
Mother wants student to major in engineering (yes=1)	0.137	0.155	0.181	0.117
	0.077	(0.109)	0.109	(0.177)

Mechanisms? Low math performance girls

	Control Mean	Treatment - Control	T1 - Control	T2 - Control
Student considers she has necessary aptitude to study industrial engineering (yes=1)	0.153	-0.015	-0.029	-0.002
	(0.039)	(0.041)	(0.045)	(0.043)
Students recommends engineering to a top performance math girl in class (yes=1)	0.333	0.068	0.057	0.076
	(0.070)	(0.077)	(0.102)	(0.074)
Tutor has recommended engineering to her (yes=1)	0.234	0.005	-0.011	0.019
	(0.041)	(0.055)	(0.057)	(0.061)
Mother wants student to major in engineering (yes=1)	0.136	-0.063**	-0.074**	-0.054*
	(0.022)	(0.027)	(0.028)	(0.031)

Preliminary results: summary

- Heterogenous impacts?: As a function of math performance.
- Self-reported preferences vs intention to study (as capture by small scholarships drafts)
- Mechanisms: influence of teachers and parents?

Next steps: study enrollment decisions

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Ingrese el código de la imagen

2024 ▼

 **BUSCAR**

 **LIMPIAR**

ESTUDIANTE	UNIVERSIDAD	AÑO Y PERIODO	TIPO DE CARNÉ	PROCESO	ESTADO
M C D I C G	INSTITUCIÓN: Universidad de Piura FACULTAD: Facultad de Ciencias Económicas y Empresariales CARRERA: Economía (Reconocido por Lic.)	AÑO DE INGRESO: 2024 PERIODO DE INGRESO: 01	Regular	2024	Entregado a la Universidad

Thank you!