

Let's tweet again?
Twitter and grades in literature
of high school students.
Preliminary results of a RCT.

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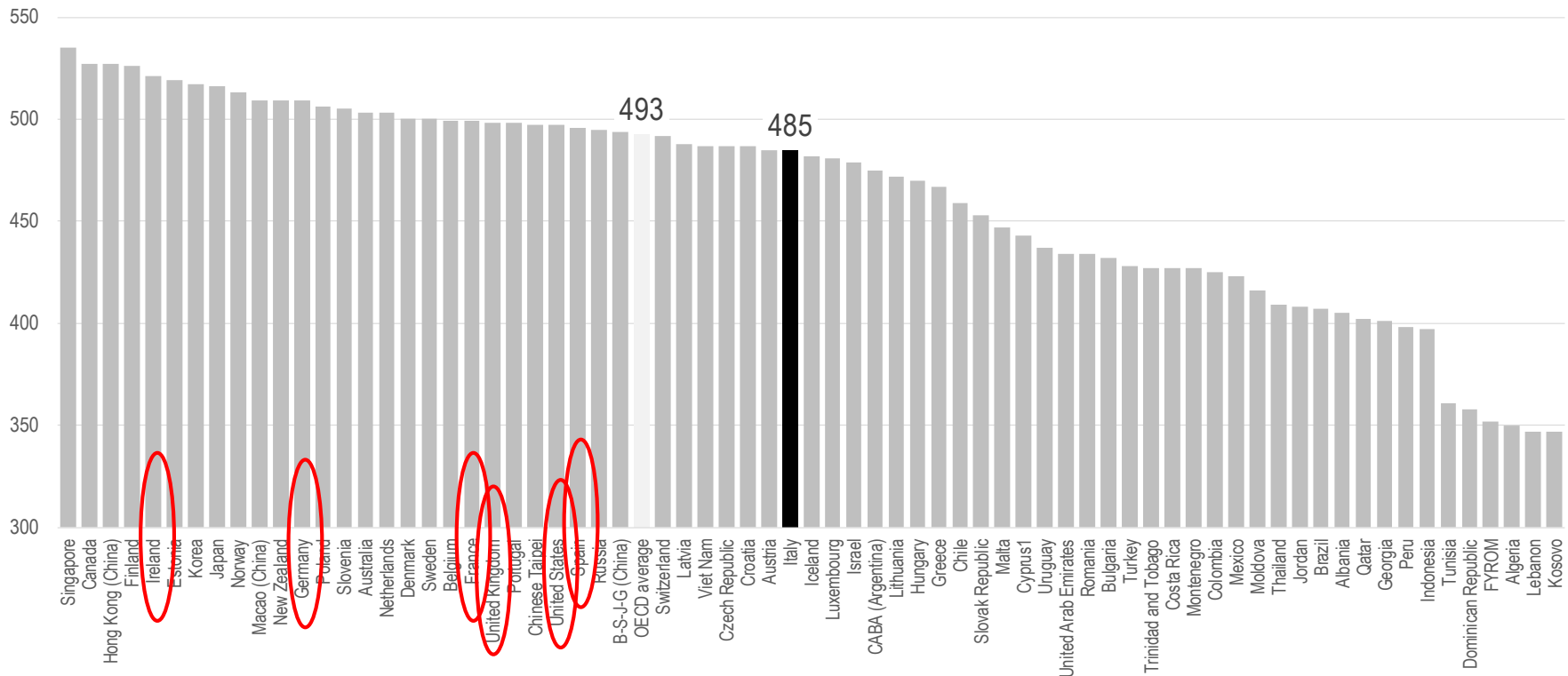
York University, RCTs in the Social Sciences
Twelfth Annual Conference - September 6th-8th 2017

The problem

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Italian students have poor performance in reading (34th in the latest PISA survey)

Performance in reading (PISA 2015 - mean scores)



The opportunity (or problem?)

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International Edition +

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Teens spend a 'mind-boggling' 9 hours a day using media, report says

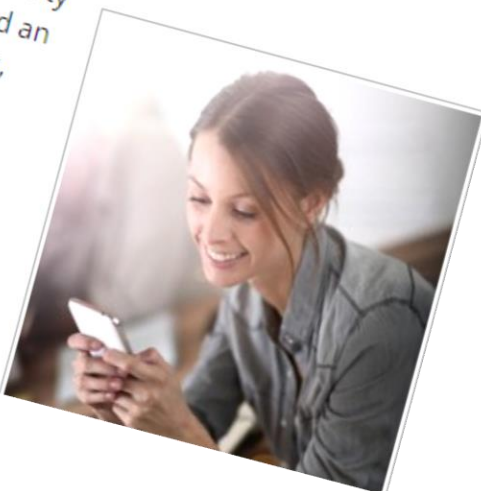
By Kelly Wallace, CNN
Updated 02:07 GMT (10:07 HKT) November 4, 2015



College Students In Study Spend 8 to 10 Hours Daily on Cell Phone

By Janice Wood
- 2 min read

A new study from researchers at Baylor University has found that women college students spend an average of 10 hours a day on their cell phones, while men spend about eight hours.



The Telegraph

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Teenagers spend 27 hours a week online: how internet use has ballooned in the last decade

The amount of time young people spend online has trebled in the past 10 years, while 70pc of adults feel comfortable giving away personal information

The questions

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- Could social networks represent an opportunity, and not only a risk, for young people?
- Could **social media** be used for **improving young people's skills in literature**?
- Is *Twletteratura* (*TWØ*) an effective method for **increasing the knowledge in literature of upper secondary school students**?

What is the Twletteratura.org method?

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THE TWLETTERATURA METHOD

The TwLetteratura method enables people to read and comment together on cultural contents through Betwyll and Twitter.

TwLetteratura is the name of the methodology we employ to read and develop works of literature, arts, and culture, through the interactive experience and the co-creation potential offered by social networks. This method has been experimented by **Paolo Costa**, **Edoardo Montenegro** and **Pierluigi Vaccaneo** since January 2012; around them, an ample and devoted community of people has developed, composed of thousands of enthusiasts and some hundreds of regular 're-writers'.

The Twletteratura method

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How does it work?

<https://www.twletteratura.org/2017/03/the-twletteratura-method/>

Twletteratura in Italian high schools

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Twletteratura.org promotes its method in high schools to **educate students to literature (reading and comprehending literary text)**.

Main features of TWℓ in schools:

- 1) A common reading calendar (some chapters a week);
- 2) After reading, everyone can post tweets (comments, citations, paraphrases, etc.);
- 3) Teachers and the central unit of TWℓ interact and animate the discussion.

The TWℓ method: why should it work?

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- 1) Education through social networks reduces stress, hence encouraging the participation of the less diligent students;
- 2) Interacting with other people encourages to be well aware of what you read and write;
- 3) The 140-characters limit requires a deep analysis of content of text and this favors a greater understanding;
- 4) The 140-characters limit creates osmosis between spoken and written language.

THE RANDOMIZED CONTROLLED TRIAL

Design of the trial

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- In school year (sy) 2016/17, Twletteratura.org invited Italian high schools teachers to adopt the TWℓ method for studying «Il fu Mattia Pascal» (*The late Mattia Pascal*) by L. Pirandello, a classic Italian novel.
- Teachers voluntarily entered the project; their schools were randomly assigned to two groups:
 - 1) **group 1** adopted the TWℓ method since the very beginning of sy 2016/17;
 - 2) **group 2** adopted the TWℓ method only during the second term of sy 2016/17.
- Both groups read the first 10 chapters of the book during the first term (the last 10 during second term).

Outcome variables and their measurement

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- The project aims at increasing student's skills in literature (memorizing, understanding and explaining the novel).
- We administered two online tests:
 - 1) a **baseline test** (BL) (at the beginning of sy 2016/17), aimed at measuring students' general skills in language and literature;
 - 2) a **follow-up test** (at the end of first term) to measure student's knowledge of the first 10 chapters of the novel «Il fu Mattia Pascal».
- Our **dependent variable** is the difference between each student's score in follow-up and baseline test.

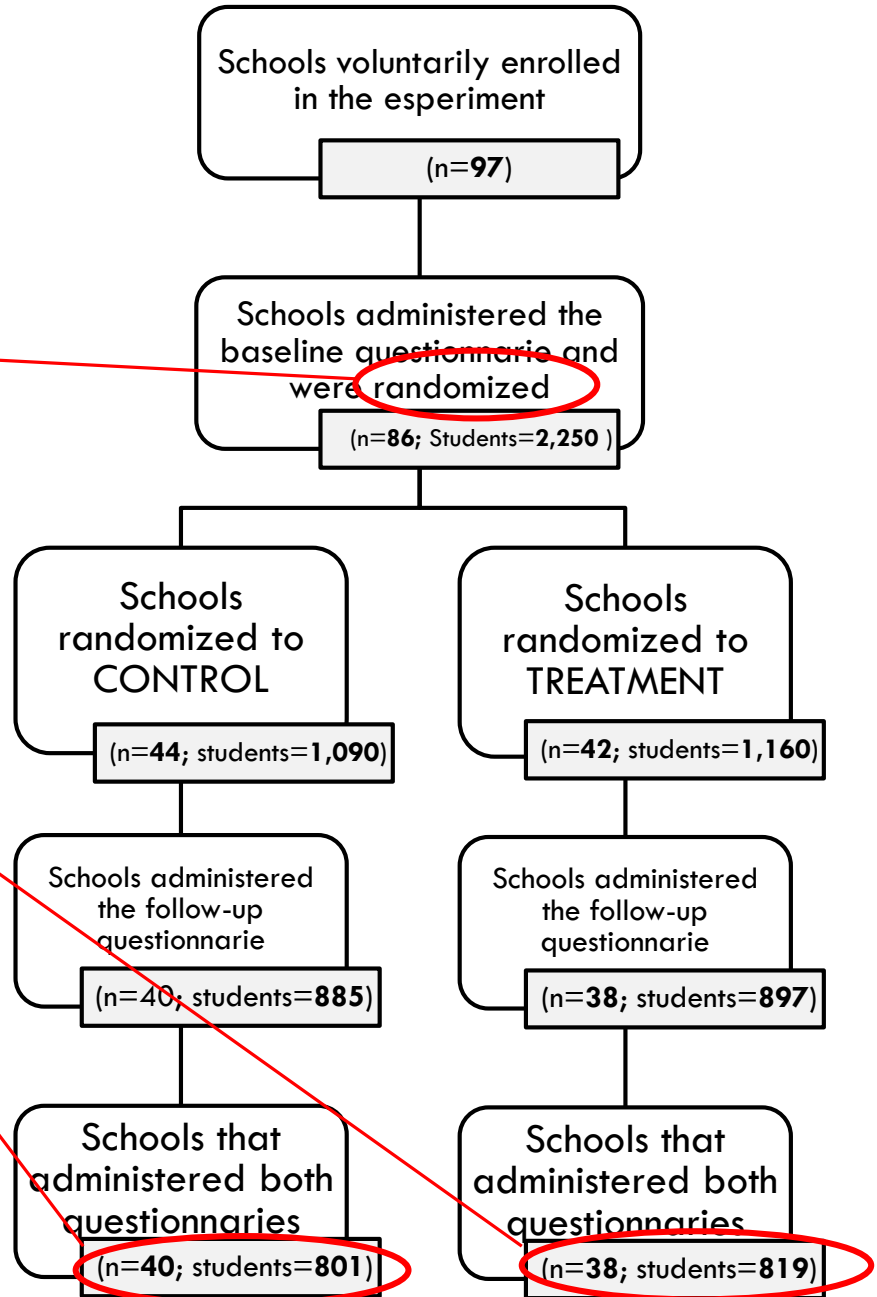
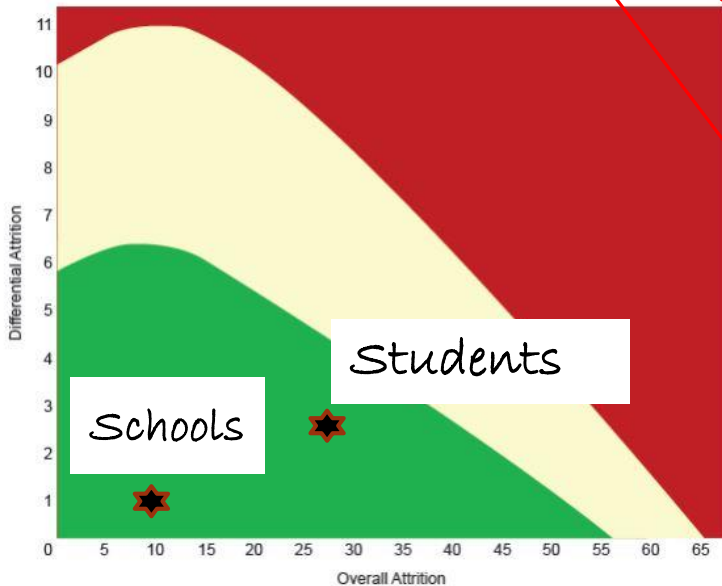
Consort-like diagram

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See next slides for details

Attrition under control

WWC attrition standards



The randomization process - 1

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STEP 1 – Stratification

Schools administering the BL questionnaire were stratified by three covariates:

- 1) Performance in literature (average school score at BL test: quartiles);
- 2) Geographic area (North, Center, South and Islands);
- 3) Number of students involved (one class, more than one class).

The randomization process - 2

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STEP 1 – Stratification

<i>Performance</i>	<i>Geographic area</i>			<i>Total</i>
	<i>North</i>	<i>Center</i>	<i>South and Islands</i>	
<i>One class</i>				
First quartile	7	2	7	16
Second quartile	8	1	3	12
Third quartile	5	2	4	11
Fourth quartile	8	2	5	15
<i>More than one class</i>				
First quartile	2		4	6
Second quartile	4		6	10
Third quartile	1	2	9	12
Fourth quartile		1	3	4
<i>Total</i>	35	10	41	86

The randomization process - 3

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STEP 2 – Random sample selection

Some cells of stratification (10) included an odd number of schools. In these cells, one school was randomly excluded (residual schools).

As a result, 76 school were included in cells with an even number of schools.

**Stratification
after
random
selection**



<i>Performance</i>	<i>Geographic area</i>			<i>Total</i>
	<i>North</i>	<i>Center</i>	<i>South and Islands</i>	
<i>One class</i>				
First quartile	6	2	6	14
Second quartile	8		2	10
Third quartile	4	2	4	10
Fourth quartile	8	2	4	14
<i>More than one class</i>				
First quartile	2		4	6
Second quartile	4		6	10
Third quartile		2	8	10
Fourth quartile			2	2
<i>Total</i>	32	8	36	76

The randomization process - 4

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STEP 3 – First randomization

In each cell of the previous table, schools were randomly assigned to the treatment (50%) or the control group (50%): 38 treated schools and 38 control schools.

STEP 4 – Second stratification

Residual schools were stratified by performance in literature

<i>Performance</i>	
First quartile	2
Second quartile	2
Third quartile	3
Fourth quartile	3
Total	10

The randomization process - 5

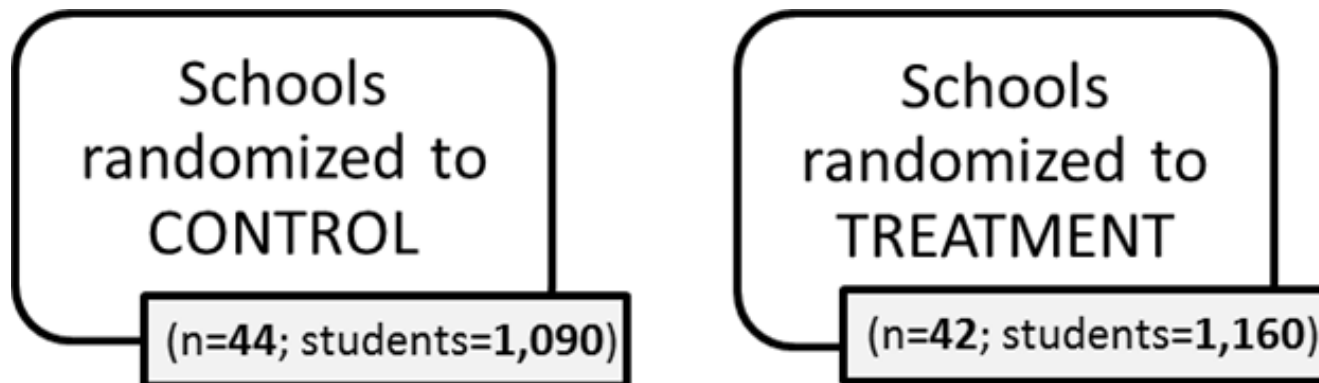
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STEP 5 – Second randomization

In each cells of the previous table, one school was randomly assigned to the treatment group (50% in cells 1 and 2; 33% in cells 3 and 4).

All residual schools were assigned to the control group to better balance the number of treated and control STUDENTS.

FINAL ALLOCATION



Balance in treated and control groups 1

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Characteristics
at baseline test

**Very well
balanced with
average
school
values**

Data referred to 78 schools (38 treated) and 1,620 students (819 treated) taking baseline and follow-up questionnaires	Treated % values (std error)	Control % values (std error)
Baseline test score	64.8 (1.8)	63.5 (2.0)
Female	58.4 (4.2)	56.7 (4.4)
Foreign students	8.1 (1.9)	7.2 (1.5)
Students in Northern Italy	42.1 (8.1)	39.0 (7.7)
Students in Central Italy	15.8 (6.0)	26.8 (7.0)
Students in Southern Italy	42.1 (8.1)	34.1 (7.5)
Students attending <i>Licei</i>	57.9 (8.1)	59.8 (7.7)
Students attending technical schools	28.9 (7.5)	30.5 (7.2)
Students attending professional schools	13.2 (5.6)	9.8 (4.7)
Students in 11 th to 13 th grade	37.9 (7.9)	45.6 (7.6)
Students with at least one parent with university degree	28.0 (3.6)	29.3 (3.2)
Students with at least one parent with high professional status	58.3 (3.0)	53.0 (3.1)
Students with at least two shelves of books at home	41.4 (4.2)	45.4 (3.7)
*** p< .01; **p< .05		

Balance in treated and control groups 2

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Characteristics
at baseline test

**Some
imbalances
with
individual data**

(but differences in score
at BL test are not
relevant when
controlling for
covariates)

Data referred to 78 schools (38 treated) and 1,620 students (819 treated) taking baseline and follow-up questionnaires	Treated	Control
	% values (std error)	
Baseline test score	64,1 (0,6)	66,0** (0,6)
Female	54,9 (1,7)	54,2 (1,8)
Foreing students	5,9 (0,8)	6,5 (0,9)
Students in Northern Italy	37,7 (1,7)	29,5** (1,6)
Students in Central Italy	14,8 (1,2)	20,7** (1,4)
Students in Southern Italy	47,5 (1,7)	49,8 (1,8)
Students attending <i>Licei</i>	58,5 (1,7)	73,9*** (1,6)
Students attending technical schools	29,1 (1,6)	22** (1,5)
Students attending professional schools	12,5 (1,2)	4,1*** (0,7)
Students in 11 th to 13 th grade	28,2 (1,6)	45,2*** (1,8)
Students with at least one parent with university degree	33,3 (1,6)	31,7 (1,6)
Students with at least one parent in high economic position	59,7 (1,7)	54,6 (1,8)
Students with at least two shelves of books at home	45,1 (1,7)	46,2 (1,8)

*** p < .01; ** p < .05

DATA ANALYSIS

Models - ITT

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ITT – Effect of being assigned to the treatment group

We estimated several models using both schools and students as units of analysis.

SCHOOLS as units of analysis - ITT

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Dependent variable: difference in score between baseline and follow-up tests	Treatment group coefficient (std error)
School (n=78)	
Model 1: Difference between averages	-3,448 (2,659)
Model 2: OLS regression with covariates	-5.307* (2.761)
Model 3: OLS regression with covariates, data weighted with the number of students	-4.659** (1.990)
Covariates include: Gender, Nationality, location (North, Center, South), School type (Liceo, technical, professional), School grade, Parents' background.	
*** p< .01; **p< .05; p<.1	

STUDENTS as units of analysis - ITT

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Dependent variable: difference in score between baseline and follow-up tests (%)	Treatment group coefficient (std error)
Students (n=1,620)	
Model 1: Difference between averages	-3.075*** (0.816)
Model 2: OLS regression with covariates, and cluster robust standard error	-4.085*** (1.824)
Model 3: R-E panel regression (data grouped at the school level)	-3.865 (2.704)
Covariates include: Gender, Nationality, location (North, Center, South), School grade, School type (Liceo, technical, professional), Parental background	
*** p< .01; **p< .05; p<.1	

Compliance - LATE

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Not all students put the same effort into the project:
> 62.3% posted at least one tweet
> 28.4% posted at least five tweets.

To tackle this problem of compliance we instrumented the two binary variables:

- 1) at least one tweet posted;
- 2) at least five tweet posted

(with randomization as IV) and analyzed their impact on the outcome variable.

Models – students - LATE

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Dependent variable: difference in score between baseline and follow-up tests	Treatment group coefficient (std error)
Students' data	
Instrumented variable: at least one tweet posted	
I-V regression with covariates and cluster robust standard error (school)	-6.444** (2.898)
Instrumented variable: at least five tweets posted	
I-V regression with covariates and cluster robust standard error (school)	-14.020** (6.692)
Covariates include: Gender, Nationality, location (North, Center, South), School type (Liceo, technical, professional), School grade, Parents' background.	
*** p< .01; **p< .05; p<.1	

HETEROGENEOUS EFFECTS

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Which students were most influenced by the method?

With STUDENTS as units of analysis, we estimated the following models

- 1) difference between averages of the outcome var.;
- 2) OLS regression model with control variables and cluster robust st. err.;
- 3) panel random-effect model (data grouped at the school level).

HETEROGENEOUS EFFECTS

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Dependent variable: difference in score between baseline and follow-up tests - Individual data	Model 1	Model 2	Model 3
Sub-group	Treatment group coefficient (std error)		
Females (n=884)	-6,233*** (1,098)	-6,844*** (1,884)	-7,014*** (2,700)
Italian citizens (n=1,520)	-3,240*** (0,843)	-4,128** (1,774)	-2,876 (2,321)
Northern Italy (n=545)	-4,549*** (1,417)	-5,143 (3,411)	-6,657 (4,166)
Central Italy (n=287)	-5,000*** (1,900)	-3,670 (2,397)	-0,525 (5,371)
Licei (n=1,071)	-4,754*** (0,981)	-4,766*** (1,766)	-5,573** (2,669)
Parents without university degree (n=1,093)	-3,508*** (0,989)	-4,857** (2,139)	-3,515 (2,357)
Baseline test score below average (n=664)	-4,697*** (1,224)	-3,941 (2,535)	-3,534 (2,664)
Baseline test score above average (n=956)	-3,509*** (0,909)	-3,348* (1,693)	-1,154 (2,017)
*** p< .01; **p< .05; *p<.1			

In a few words

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- 1) We **fail to find any positive effect** of the TWI method on the outcome variable;
- 2) On the contrary, **we find statistically significant average detrimental effects**, particularly when considering students as units of analysis;
- 3) The **size** of these negative effects is about 0.2 standard deviations;
- 4) The **negative effects** appear to be **particularly relevant** for **females**, students attending **Licei**, and students with parents **without a university degree**.

What happened? Preliminary thoughts

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- 1) When individuals can take a shortcut ... they take it;
Why should students be different?
(If I post my slides, no one of my students will ever read an assigned book! If one of their colleagues posts a few pages synthesis of the slides, just a few will read both books and slides).
- 2) Twl believed they could drag students that spent a lot of time on social networks toward literature ... but probably the opposite came true.

**THANK YOU VERY MUCH
FOR YOUR ATTENTION!**