Active learning fosters financial behavior: Experimental evidence from rural Uganda

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ABSTRACT

We conduct a randomized field experiment to study the effects of two financial education interventions offered to small-scale retailers in Western Uganda. The treatments contrast "active learning" with "traditional lecturing" within standardized lesson-plans. We find that active learning has a positive and economically meaningful impact on savings and investment outcomes, in contrast to insignificant impacts of lecturing. These results are not conditional on prior education or financial literacy. Tentative evidence suggests that only active learning stimulates several cognitive and non-cognitive mechanisms; moreover, a social mechanism may be at play as treated individuals join social groups discussing financial matters.

STATE OF THE LITERATURE

Evidence from recent experiments suggests that intervention-impacts may be higher when financial education (FE) is …

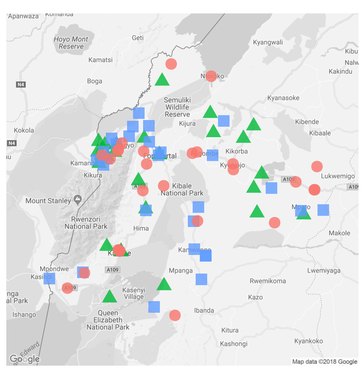
- offered at a teachable moment (Miller et al. 2015, Kaiser & Menkhoff 2017),
- simplified (rules of thumb) (Drexler et al. 2014, Skimmyhorn et al. 2016),
- personalized (Carpena et al. 2015),
- convenient and entertaining (Berg and Zia 2017).

→ What about differences in teaching methods?

RESEARCH DESIGN

- Pre-registered randomized trial (RCT) at AEA RCT registry
- Cluster-RCT with 1,291 small-scale retailers in 83 marketplaces (clusters) in Western Uganda
- Random assignment of two different financial education treatments at the cluster-level (balanced at baseline)
- Measurement of field behaviors and financial outcomes 6 months after treatment (short-term effects)
- MDES: 0.15 SD units at 80% Power (at α = 0.05)
- Attrition-rate: 9.9%

Study region

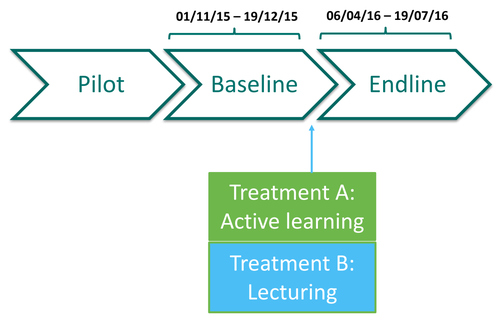


The FL programs

- Two standardized FL programs
- Both trainings cover five topic areas: (i) budgeting, (ii) savings, (iii) loans, (iv) investment, (v) financial service providers
- Intensity for both: 120 minutes
- Same teachers (ToT by Central Bank of Uganda)
- Same class-size (15-16 students per class)
- What differs is the **teaching method**:
  - Treatment A: Active learning
    - Five stations covering the topic areas
    - Use of visuals, a narrative, and games
    - *Constructivist*
  - Treatment B: Traditional lecturing
    - Community lecture
    - Q&A
    - *Exposition-centered*

Treatments vary in the degree of participant involvement.

Timeline and empirical strategy



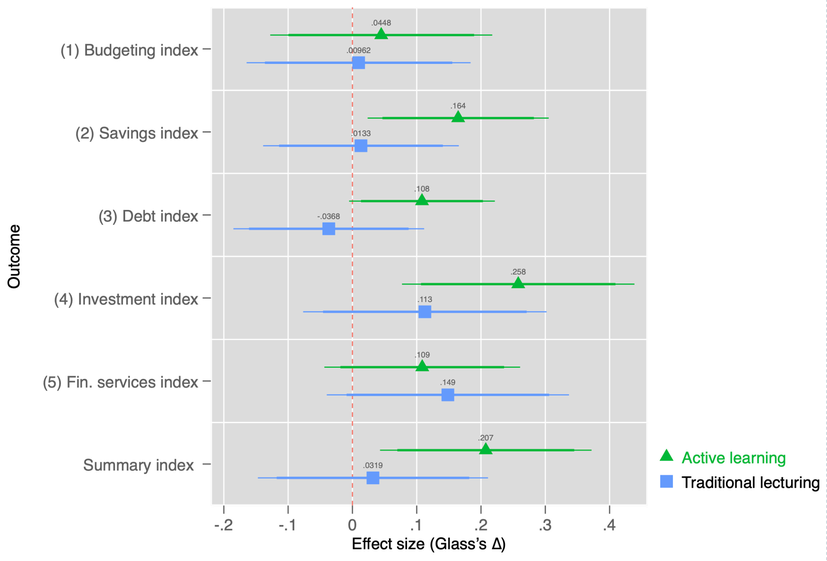
ANCOVA model to estimate (*intention-to-treat*) treatment effects for the two treatments A_{ic}^{T} and B_{ic}^{T} (standard errors are clustered at the market-level to account for the level of randomization):

$$y_{ic(t)} = \alpha + \delta_1 y_{ic(t-1)} + \beta_1 A_c^T + \beta_2 B_c^T + \theta_d + \varepsilon_{ict}$$

$y_{ic(t)}$: measure of financial behavior for individual i in cluster c at the time of follow-up (t). $y_{ic(t-1)}$: lagged value of the outcome at baseline and θ_d are district-level fixed-effects. ε_{ict} denotes the error-term.

Results on indices of outcomes: $y_k^* = \frac{y_k - \mu_k}{\sigma_k}$, with μ_k denoting the mean of y_k for the control group (C) and σ_k denoting the standard deviation of y_k for the control group. The aggregate index then takes the following form: $y^* = \frac{\sum_k y_k^*}{k}$. Finally, we standardize the outcome index (y^*) to have a mean of zero and standard deviation of one for the control-group.

RESULTS



Economic significance

Savings after 6 months

Extensive margin:

87.8 % of the control group have **any savings**

Active learning: + 3.8 pp (i.e. 91.6%)

Lecturing: +2.7 pp (i.e. 90.5 %)

↑ + 21 %

Intensive margin:

The control group has **total savings** of 480 $ (PPP 2016)

Active learning + 102 $ (i.e. 582 $)

Lecturing: - 30 $ (i.e. 450 $)

↑ + 38 %

The control group has **net savings** of 355 $ (PPP 2016)

Active learning: + 136 $ (i.e. 491 $)

Lecturing: - 13 $ (i.e. 342 $)

Investments after 6 months

Total productive investment:

The control group has made **total investments** of 281 $ (PPP 2016)

Active learning + 84 $ (i.e. 365 $)

Lecturing: +39 $ (i.e. 320 $)

↑ + 29.9 %

Business formalization:

23.2 % of the control group have **formally registered their business with authorities**

Active learning: + 7.7 pp (i.e. 30.9%)

Lecturing: + 6 pp (i.e. 29.2 %)

Total durable assets:

Mean number of assets in the contol group: 51.38:

Active learning + 5.41 (i.e. 56.59)

Lecturing: + 2.22 (i.e. 53.6)

↑ + 10.5 %

Causal pathways

Potential cognitive and non-cognitive mediators

	(1) Fin. literacy (z)	(2) Self-control (z)	(3) Fin. confidence (z)
Treatment A	0.151*	0.147*	0.159*
	(0.086)	(0.079)	(0.082)
Treatment B	0.076	-0.063	0.192**
	(0.076)	(0.092)	(0.083)
$A - B = 0$ (p-value)	0.375	0.019**	0.697
R^2	0.026	0.022	0.009
Mean (SD) of y_t in control group	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)
Observations	1,162	1,157	1,027
Clusters	83	83	83
District FEs	yes	yes	yes

Notes: Results from OLS regressions. Standard errors (clustered at the market-level) are reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Potential social mechanisms (*causal mediation analysis, Imai et al. 2011*)

	(1) Any group membership	(2) Savings index (z)	(3) Investment index (z)	(4) Summary Index (z)
Treatment A	0.047*			
	(0.026)			
Treatment B	-0.013			
	(0.029)			
$A - B = 0$ (p-value)	0.041**			
R^2	0.111			
ACME (Any group membership)		0.022	0.010	0.016
[90% CI]		[0.003, 0.043]	[0.001, 0.021]	[0.001, 0.034]
Direct Effect (Treatment A)		0.126	0.244	0.188
[90% CI]		[0.014, 0.235]	[0.095, 0.389]	[0.050, 0.323]
Total Effect (Treatment A)		0.148	0.254	0.204
[90% CI]		[0.029, 0.259]	[0.101, 0.400]	[0.059, 0.339]
% of Total effect mediated		14.88	3.84	7.96
[90% CI]		[8.00, 54.62]	[2.41, 9.43]	[4.71, 25.14]
Mean (SD) of y_t in control group	0.805 (0.397)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)
Observations	1,155	1,154	1,002	891
Clusters	83	83	83	83
District FEs	yes	yes	yes	yes
$y_{(t-1)}$ covariate	yes	yes	yes	yes

	(a) Savings index			(b) Investment index		
	(1) Any savings	(2) Total savings*	(3) Net savings*	(4) Total investments*	(5) Business formally registered	(6) Total number of durable items owned
Treatment A	0.038* (0.020)	109,186* (65,132)	145,481** (64,785)	90,173* (47,461)	0.077** (0.034)	5.408*** (2.027)
Treatment B	0.027 (0.023)	-32,519 (68,588)	-14,226 (66,477)	41,801 (63,124)	0.060 (0.037)	2.215 (1.625)
$A - B = 0$ **(p-value)**	0.601	0.052*	0.025**	0.487	0.640	0.088*
R^2	0.024	0.244	0.131	0.184	0.035	0.520
Mean (SD) of y_t in control group	0.878 (0.328)	513,629 (937,119)	380,568 (973,769)	301,067 (526,957)	0.232 (0.423)	51.384 (34.344)
Observations	1,161	1,162	1,162	1,053	1,110	1,162
Clusters	83	83	83	83	83	83
District FEs	yes	yes	yes	yes	yes	yes
$y_{(t-1)}$ covariate	yes	yes	yes	yes	yes	yes

KEY POINTS

1) **Financial education works**: intended treatment effects with very short (120 min) course.
2) **Active learning outperforms lecturing** in almost every outcome domain.
   - ✓ Significant increase in savings
   - ✓ Significant increase in investments into the own business
   - ✓ Significant increase in financial literacy and self-control
3) **Social mechanism** may explain the observed treatment effects
   - ✓ Individuals treated with active learning are more likely to join social groups to discuss personal financial matters

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