

Personnel Management and School Productivity: Evidence from India

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Motivation

There are...

...**major disparities in the quality of education** within and between countries: we are in a **learning crisis**. *Pritchett 2015, WDR 2018*

... only 30% of 3rd graders are able to perform reading and math tasks at their grade level. *ASER, 2016*

... two binding constraints for governments: *Glewwe and Muralidharan 2016*

pedagogy

governance

Key aspect of governance: school management

Efforts to manipulate key educational inputs have been hampered by an **inability to identify school inputs** that predict **student achievement**.

— Hanushek 1997

This inability is due, at least in part, to a **paucity of detailed data on the strategies and operations of schools**... Measures of teacher development, data driven instruction, school culture, and student expectations have never been collected systematically, despite decades of qualitative research suggesting their importance.

— Dobbie and Fryer (2014)

Key things we know thus far

Management practices

... are **correlated** with **school cross-sectional test scores** in secondary education in OECD countries, Brazil and India. Bloom, Lemos, Sadun, Van Reenen (2015)

... have been shown to be **causally related** to student learning in experimental settings in the US. Fryer (2014, 2017)

▶ literature

This paper

Documents the **first detailed picture** of management practices in public schools in rural India.

Documents the first correlation between **management** practices and school **productivity** in this context.

Explores **public-private sector management differences**.

Investigates how these differences translate into variation in school policy.

① Introduction

② Methodology & Data

③ Results

④ Conclusion

Methodology & data

DWMS: Development World Management Survey: 2013

School management data from nearly 300 schools in 5 districts in rural Andhra Pradesh.

Face-to-face interviews with school principals

Scores on quality of management across **20 basic management practices** on a grid of 1 (“least structured”) to 5 (“most structured or best practice”), in increments of 0.5. The overall management score is an average of the 20 primary practices.

Conceptual framework

Recent **empirical evidence** helps us formulate a **conceptual framework** to understand how management affects learning. *Dobbie & Fryer ('13)*, *Bloom et al ('14)*, *Mbiti ('16)*, *Muralidharan ('12)*, *Ashraf et al ('15)*.

Operations management

- Data-driven methods

- Performance monitoring

- Target setting

People management

- Selection and retention of teachers

- Re-allocation of poor performing teachers

- On-the-job training

- Incentivize teacher effort without crowding out intrinsic motivation.

Methodology & data

← developingmanagement.org

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D-WMS DEVELOPMENT WORLD MANAGEMENT SURVEY

RUN YOUR SURVEY ▼ BENCHMARK YOUR SCHOOL PUBLICATIONS ▼ DATA ABOUT ▼

NESTA ESCOLA TEM... **EDUCAÇÃO**

RUN YOUR SURVEY

This website includes an online portal that allows researchers to conduct their own data collection projects, with interactive support throughout the process.

[CLICK HERE](#)

How the D-WMS is different

The Development World Management Survey is an expanded survey tool to measure the quality of management practices at schools and hospitals in developing countries.

Example of data collection and usage

One school had **excellent report cards** and were routinely filled out...

The image shows a stack of 'SCHOOLWIDE GENERAL ANALYSIS' report cards. Each card is filled out with data for various subjects and students, showing a high level of data collection.

The image shows two 'HALF YEARLY EXAMINATION' report cards. The left card shows a table of scores for subjects like English, Math, and Science. The right card shows a table of scores for subjects like English, Math, and Science. Both cards are filled out with data.

CLASS	5	6	7	8	9	10	11	12
ENGLISH	80	85	88	90	92	95	98	100
MATHEMATICS	75	80	82	85	88	90	92	95
SCIENCE	70	75	78	80	82	85	88	90
SOCIAL STUDIES	65	70	72	75	78	80	82	85
ARTS	60	65	68	70	72	75	78	80
PHYSICAL EDUCATION	55	60	62	65	68	70	72	75
MUSIC	50	55	58	60	62	65	68	70
TECHNOLOGY	45	50	52	55	58	60	62	65
WELLNESS	40	45	48	50	52	55	58	60
TOTAL	400	420	440	460	480	500	520	540

... but they stayed stacked in the corner of the principal's office. The **data was not compiled** in useful ways.

In the WMS, this would have been a score of 3, **masking some crucial information**: implementation of the data collection process was excellent, and monitoring was adequate, but usage was abysmal.

Methodology & data

Andhra Pradesh School Choice Program data: 2008-2012

Student: test scores and characteristics.

Teacher: education, experience and compensation. [▶ summ stats](#)

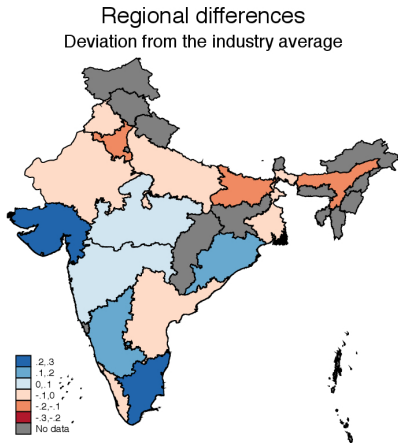
Classroom obs: data on class obs, teacher activities. [▶ summ stats](#)

School chars: public/private, size, infrastructure level. [▶ summ stats](#)

Institutional context

- **Fifth largest** Indian state
- **Small schools:** 75% rural population and government prioritizes providing primary schooling within 1km of homes
- Primary schools cover grades 1-5.
- 3.2 million children in public, 2.1 million in private schools in AP.
- In our sample: average public school size is 65 students and 3 teachers. Private school size is 213 students and 14 teachers.
- **No detention** policy

School management across India



Note: Only includes data from states with 5 or more observations. WMS data.

Lemos and Scur (2012)

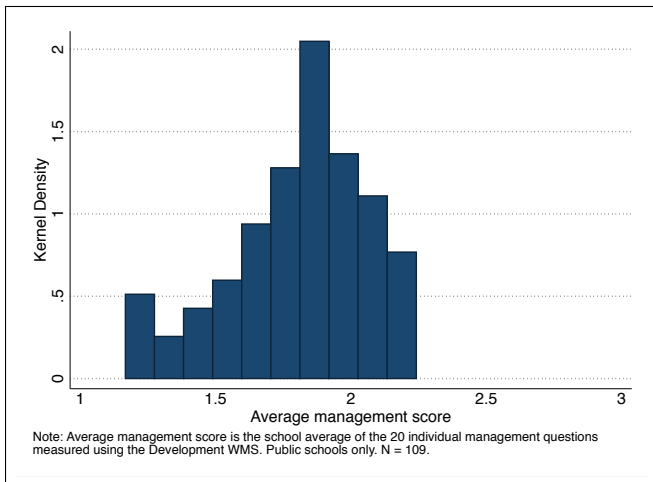
① Introduction

② Methodology & Data

③ Results

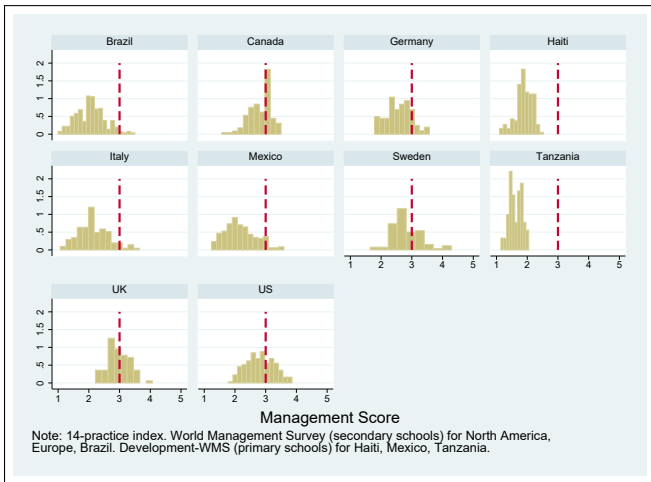
④ Conclusion

Result 1a: Poor management in public schools in AP...

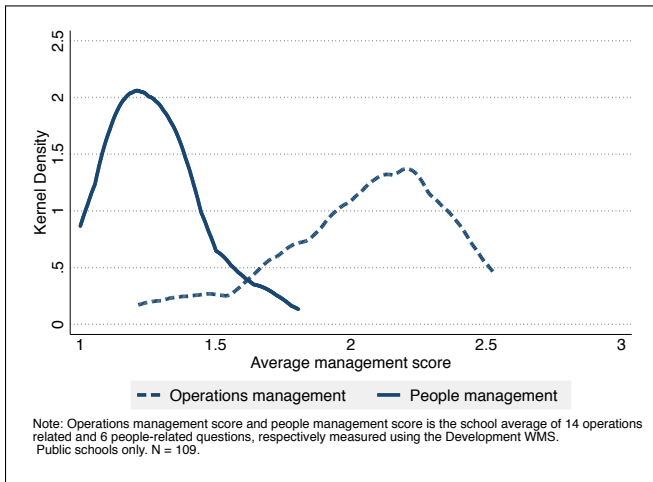


median = 1.84, SD = 0.25, 90th = 2.05

Result 1b: ... in contrast to OECD countries but similar to other developing countries



Result 1c: ... and people management is particularly poor



people median = 1.25, operations median = 2.10

Result 2: Variation is correlated with independent measures of school productivity

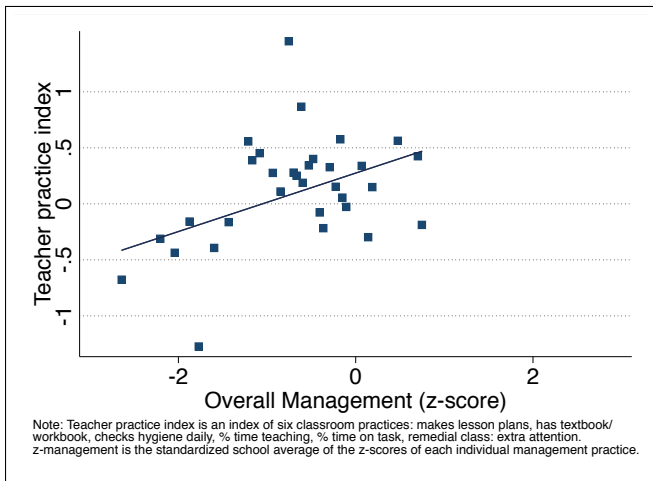
Teacher practices:

- making lesson plans
- having a copy of the textbook/workbook
- checking students hygiene daily
- share of time spent teaching
- share of time spent “on-task”
- giving remedial attention to students in-class

Student value-added:

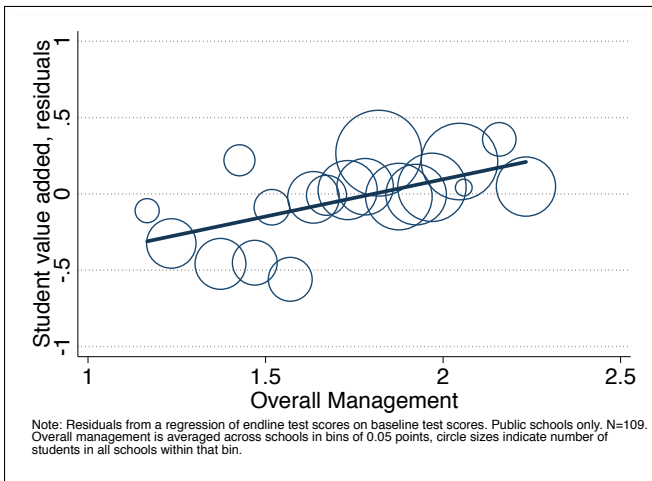
- panel data on student test scores for Math and Telugu

Result 2a: Teachers in better managed public schools use more effective practices



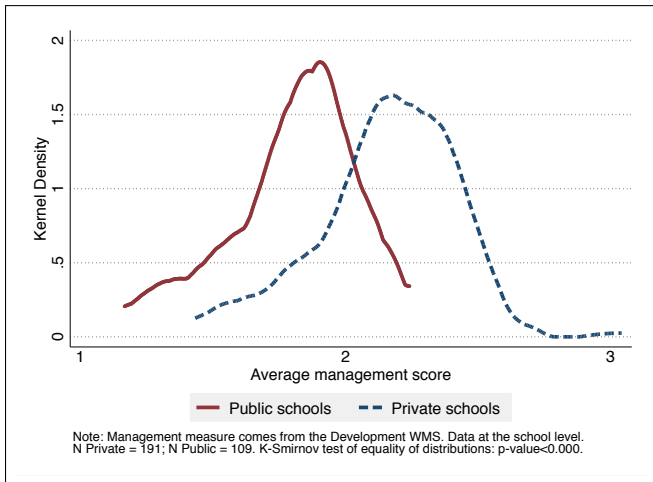
1 SD management \rightarrow 0.36 SD teacher practices

Result 2b: Students in better managed public schools have higher value added

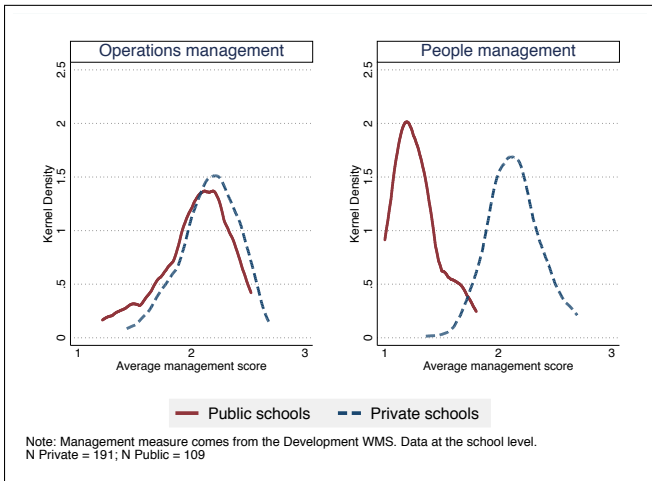


1 SD management → 0.14 SD in Math and 0.18 SD in Telugu

Result 3a: Private schools are better managed than public schools...



Result 3b: ... the difference is driven by personnel management.



Private school advantage in people mgmt = 0.87

Result 3c: Personnel management explains much of the private school difference in student value added

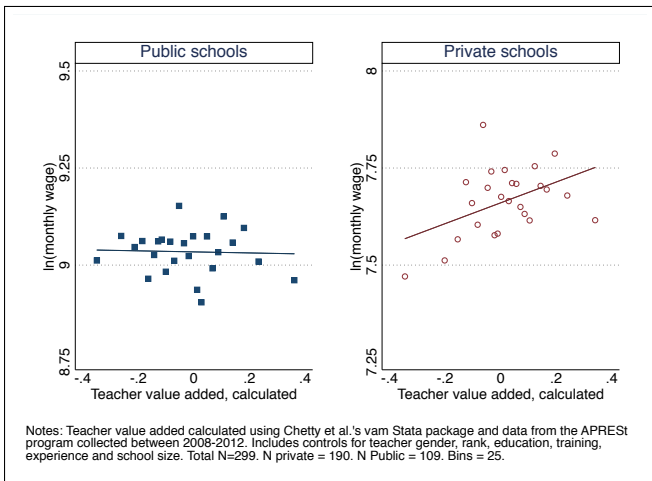
	Math and Telugu				
	(1) endline test score	(2) endline test score	(3) endline test score	(4) endline test score	(5) endline test score
Private = 1	0.375*** (0.071)	0.281*** (0.072)	0.336*** (0.068)	0.112 (0.096)	0.143 (0.111)
Scholarship = 1	-0.244*** (0.080)	-0.262*** (0.081)	-0.256*** (0.082)	-0.277*** (0.077)	-0.275*** (0.077)
z-management		0.082*** (0.028)			
z-operations			0.064** (0.025)		0.022 (0.034)
z-people				0.149*** (0.041)	0.123** (0.056)
Baseline score	Y	Y	Y	Y	Y
Sch, tea, stu ctrls	Y	Y	Y	Y	Y
Observations	35883	35883	35883	35883	35883
# schools	299	299	299	299	299
R ²	0.162	0.167	0.166	0.168	0.168

How are personnel policies in public and private schools different?

Teacher wages: Rewarding high value added teachers and promoting effort.

Teacher selection/retention: Hiring and keeping high value added teachers, removing low value added teachers.

Result 4a: Private schools reward higher teacher value added, public schools do not



1 SD in TVA = 5% higher wages in private schools

Result 4b: Better managed private schools attract and retain high value added teachers, public schools do not

	Public		Private	
	(1) good HR outcome indicator	(2) good HR outcome indicator	(3) good HR outcome indicator	(4) good HR outcome indicator
main				
z-management	-0.025 (0.017)	-0.050 (0.046)	0.045** (0.012)	0.127*** (0.035)
Teacher controls	Y	Y	Y	Y
# Teachers	75	75	484	484
# Schools	36	36	152	152
Model:	OLS	Probit	OLS	Probit
Analysis level:	Teacher	Teacher	Teacher	Teacher

Note: A "good HR outcome" = 1 if highest VA teacher transferred in *or* was already in the school, if a lowest value added teacher transferred out.

1SD in MGMT → 4.5% to 12.7% more likely to have better HR outcomes in private schools

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Concluding remarks

- ① Unique new data provides evidence of low levels of management practices in public schools.
- ② Meaningful variation in management practices is strongly correlated with independently collected measures of school productivity.
- ③ People management plays an important role in explaining low levels of management practices in public schools as well as **public-private school value added differences** in Andhra Pradesh.
- ④ Private schools are better at personnel policy: they **reward and selecting/retaining** high VA teachers and remove low VA teachers, while public schools do not.

Policy implications for the public sector

- Consider using efficiency-enhancing personnel policies Bau and Das 2017, de Ree et al 2017
- Consider using public-private partnerships Romero et al 2017

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APPENDIX

Literature: mixed evidence from input-output approach

Leadership

- Principals: *E. Hanushek, S. Rivkin, D. Clark, M. Coelli, D. Green, E. Dhuey, J. Grissom, S. Loeb [...]*

Market/institutional structure

- Types of schools, effect of vouchers: *J. Angrist, P. Pathak, K. Muralidharan, R. Fryer, W. Dobbie, E. Hanushek, S. Link, L. Woessmann, C. Hsieh, M. Urquiola, M. Kremer, S. Sundararaman [...]*
- Competition: *D. Card, A. Payne, D. Clark, T. Fuchs, L. Woessmann, S. Machin, S. Gibons, E. Hanushek, S. Rivkin, C. Hoxby [...]*

Inputs

- Books, infrastructure, etc: *E. Hanushek, J. Rothstein, S. Cellini, J. Angrist, V. Lavy, P. Glewwe, M. Kremer, S. Moulin, K. Holden. [...]*
- Teachers: *R. Chetty, E. Duflo, R. Hanna, S. Ryan, V. Lavy, K. Muralidharan [...]*

... and more recently, **management practices!**

Differences in management: AP public and private schools

	Private	Public	Mean Diff	SD Private	SD Public	Private N	Public N
Overall management index	2.15	1.81	0.35***	0.26	0.25	191	109
Operations average index	2.16	2.04	0.12**	0.28	0.31	191	109
Standardisation of instructional processes	2.21	1.87	0.34***	0.42	0.33	191	109
Data driven planning and student transition	2.08	1.93	0.14***	0.39	0.34	191	109
Personalization of instruction and learning	2.25	1.98	0.27***	0.40	0.34	191	109
Adopting educational best practices	2.12	2.22	-0.10	0.43	0.64	191	109
Continuous improvement	2.16	1.89	0.27***	0.36	0.44	191	109
Performance tracking	2.32	2.24	0.08	0.47	0.43	191	109
Review of performance	2.39	2.45	-0.06	0.50	0.54	191	109
Performance dialogue	2.12	2.23	-0.11*	0.36	0.38	191	109
Consequence management	2.23	2.05	0.18***	0.47	0.42	191	109
Type of targets	2.04	1.87	0.17***	0.44	0.34	191	109
Interconnection of goals	2.21	2.11	0.10	0.51	0.53	191	109
Time horizon	2.22	2.10	0.12	0.47	0.61	191	109
Goals are stretching	1.91	1.90	0.01	0.35	0.48	191	109
Clarity of goals	2.00	1.73	0.26***	0.37	0.39	191	109
People average index	2.13	1.26	0.87***	0.26	0.18	191	109
Instilling a talent mindset	2.48	1.14	1.33***	0.42	0.28	191	109
Incentives and appraisals	2.00	1.51	0.48***	0.40	0.36	191	109
Making room for talent	2.31	1.32	0.99***	0.40	0.27	191	109
Developing talent	2.09	1.41	0.68***	0.47	0.35	191	109
Distinctive employee value	1.96	1.05	0.90***	0.37	0.16	191	109
Retaining talent	1.97	1.14	0.83***	0.31	0.18	191	109

Summary stats: school

	Private	Public	Mean Difference	SD Private	SD Public	Public N	Private N
School Characteristics							
Number of students	209.69	65.51	144.18***	135.30	40.28	109	191
Number of teachers	13.61	3.67	9.93***	8.10	5.87	109	191
Student-teacher ratio	15.98	21.58	-5.60***	6.58	7.33	109	189
Medium of instruction: telugu	0.41	1.00	-0.59***	0.47	0.00	109	191
School Infrastructure							
Average school infrastructure index	2.00	0.94	1.06***	2.99	2.06	109	191
- available water	1.00	0.97	0.02	0.03	0.13	109	191
- functional toilet	0.95	0.75	0.20***	0.20	0.39	109	191
- functional girls toilet	0.91	0.55	0.36***	0.27	0.49	109	191
- functional electricity	0.95	0.71	0.24***	0.20	0.41	109	191
- functional computers	0.64	0.03	0.61***	0.47	0.17	109	191
- functional library	0.91	1.00	-0.09***	0.27	0.00	109	191
- functional radio	0.33	0.79	-0.47***	0.46	0.34	109	191
Endline score (school average)	0.38	0.05	0.33***	0.40	0.48	109	191

[▶ back to data](#)

Summary stats: teachers

	Private	Public	Mean Difference	SD Private	SD Public	Public N	Private N
Teacher Wages							
Monthly wage (000 Rs)	2.45	12.27	-9.82***	2.95	6.15	282	1081
Teacher Characteristics							
Male	0.24	0.44	-0.20***	0.43	0.50	310	1089
Age	27.89	37.80	-9.90***	8.04	8.36	310	1090
Teaching experience	5.47	12.73	-7.27***	6.20	7.20	309	1087
Years of education	14.65	15.85	-1.21***	2.25	1.90	310	1083
-Matriculation	0.06	0.02	0.04***	0.23	0.13	310	1090
-Higher secondary	0.28	0.13	0.15***	0.44	0.34	310	1090
-College or Masters degree	0.65	0.85	-0.20***	0.47	0.35	310	1090
Completed teacher training	0.33	0.94	-0.61***	0.46	0.23	310	1090
Teacher teaches all subjects = 1	0.12	0.76	-0.65***	0.31	0.38	310	1090
(mean) potexp	8.24	16.95	-8.71***	7.99	8.11	310	1090
Teacher practices							
Teacher prepares lesson plan = 1	0.43	0.67	-0.25***	0.48	0.46	309	1088
Teacher has textbook/workbook = 1	0.38	0.36	0.02	0.47	0.46	310	1090
Teacher observes hygiene daily = 1	0.51	0.75	-0.24***	0.49	0.42	310	1087
Share of time used on teaching	0.55	0.56	-0.01	0.15	0.14	310	1088
Share of time used on teaching activities	0.73	0.70	0.03***	0.12	0.10	310	1088
Remedial action: + attention in class = 1	0.03	0.07	-0.04	0.18	0.25	184	738

▶ [back to data](#)