What Drives Teachers to Change Their Instruction?

A Mixed-Methods Study from Zambia

23 June 2022

Andreas de Barros[*,†], Junita Henry[‡], Jacqueline Mathenge[‡]

[*]MIT, [†]J-PAL, [‡]TaRL Africa

0000-0003-2154-0412

0000-0002-5600-7119

The findings, interpretations, and conclusions expressed in this presentation are entirely those of the authors. They do not necessarily represent the views of their employers. The authors have no conflict of interest to disclose.

This research is supported by the Global Partnership for Education, Knowledge and Innovation Exchange (GPE KIX) program, a joint initiative between the Global Partnership for Education (GPE) and International Development Research Centre (IDRC). The study has been registered with the Open Science Framework (OSF). The authors thank the study's research participants and gratefully acknowledge support from Pranav Bharghava, Sharnic Djaker, Maimuna Ginwalla, Isaac Mbiti, Sebastian Muñoz-Najar, Laura Poswell, Nicolás Riveros, Tavneet Suri, Nico Vromant, Teaching at the Right Level Africa, VVOB, Zambia's Ministry of General Education, *School Psychology*'s Guest Action Editors, and two anonymous reviewers.

Thank you.

This study: What we do and what we find

An exploratory study that asks

"What provokes Zambian teachers to change their instruction?"

- Uses primary qualitative data from 78 Zambian education personnel, from the school to provincial level.
- Identifies what drives teachers to change their instruction, connects these drivers to teachers' exposure to professional development activities.
- **Mixed methods:** Combines qualitative thematic analysis with unsupervised Machine Learning (topic modeling); combines qualitative analyses of associations with linear probability models.

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The study's results highlight the potential of **school-based teacher development** as a means to alter instruction, in a developing-country setting:

- Initial off-site teacher training may be best positioned to promote new teaching skills.
- Yet, they may require on-site training and mentoring that invokes **team-based problem-solving** and **verbal encouragement**.
- The findings inform a large, randomized trial of a novel continuous professional development program for primary school teachers in Zambia.

1/ Motivation

Many have grown disillusioned with in-service teacher development—

> *Most teacher development is ineffective.*
>
> World Development Report 2018
> (The World Bank, 2018, p.131)

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> *The most common forms of in-service teacher training are a "bad buy" for policy makers in low- and middle-income countries.*
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> Global Education Evidence Advisory Panel
> (The World Bank, 2020, p.21)

—though we know great teaching is at the core of child learning, and we know what to promote.

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Teaching content that allows instructors to **adjust their classes to students' learning level** (rather than students' age or grade-level curriculum) can boost learning.

> Azevedo et al. (2021); Banerjee et al. (2017); Alcott et al. (2018); Duflo et al. (2020); Angrist et al. (2020)

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In particular, **to what extent do frameworks from U.S. research translate** (Desimone, 2009), e.g., collective participation through collaborative conversations among teachers (Horn et al., 2017), pedagogically productive teacher talk (Lefstein et al., 2020), and inquiry-focused on-site problem solving through peer facilitation among teachers (Gallimore et al., 2009).

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In this study, we have three main aims:

1. Confirm teachers actually changed their instruction.
2. Investigate what drove them to make these changes.
3. Investigate the extent to which these drivers of change are associated with at-scale professional development activities.

Outline

1. Motivation
2. Context, sample, and data
3. Analytical strategy
4. Results
5. Conclusion

2/ Context, sample, and data

At random, we sampled 12 government and community schools from two provinces in Zambia

Figure 1: Geographic scope of the study

Notes. This figure shows Zambia's Southern and Eastern Provinces (highlighted in blue).

At random, we interviewed a math and a literacy teacher in grades 3-5, and their support staff

Table 1: Sample characteristics

	n	%
Panel A: Schools		
Number of schools	12	
Number of districts	10	
Number of zones	12	
Government school (vs. community school)	8	66.67
Rural school (vs. urban school)	7	58.33
Panel B: Participants		
Number of sampled individuals	83	
Non-response	5	6.02
Average interview time (hours)	0.95	
Female	35	44.87
Years of experience in role ($n = 72$)	4.7	
Works at school level (vs. above school level)	55	70.51

Note. This table displays sample characteristics for the study's schools (Panel A) and participants (Panel B). Schools' classifications (government vs. community schools), and schools' geographic location (rural vs. urban) as per Zambia's 2018 educational management information system (EMIS). For years of experience in interviewed role, data is missing for six respondents. "Works at school level" captures whether a respondent holds a school-based (e.g., a teacher) or non-school-based position (e.g., a district official).

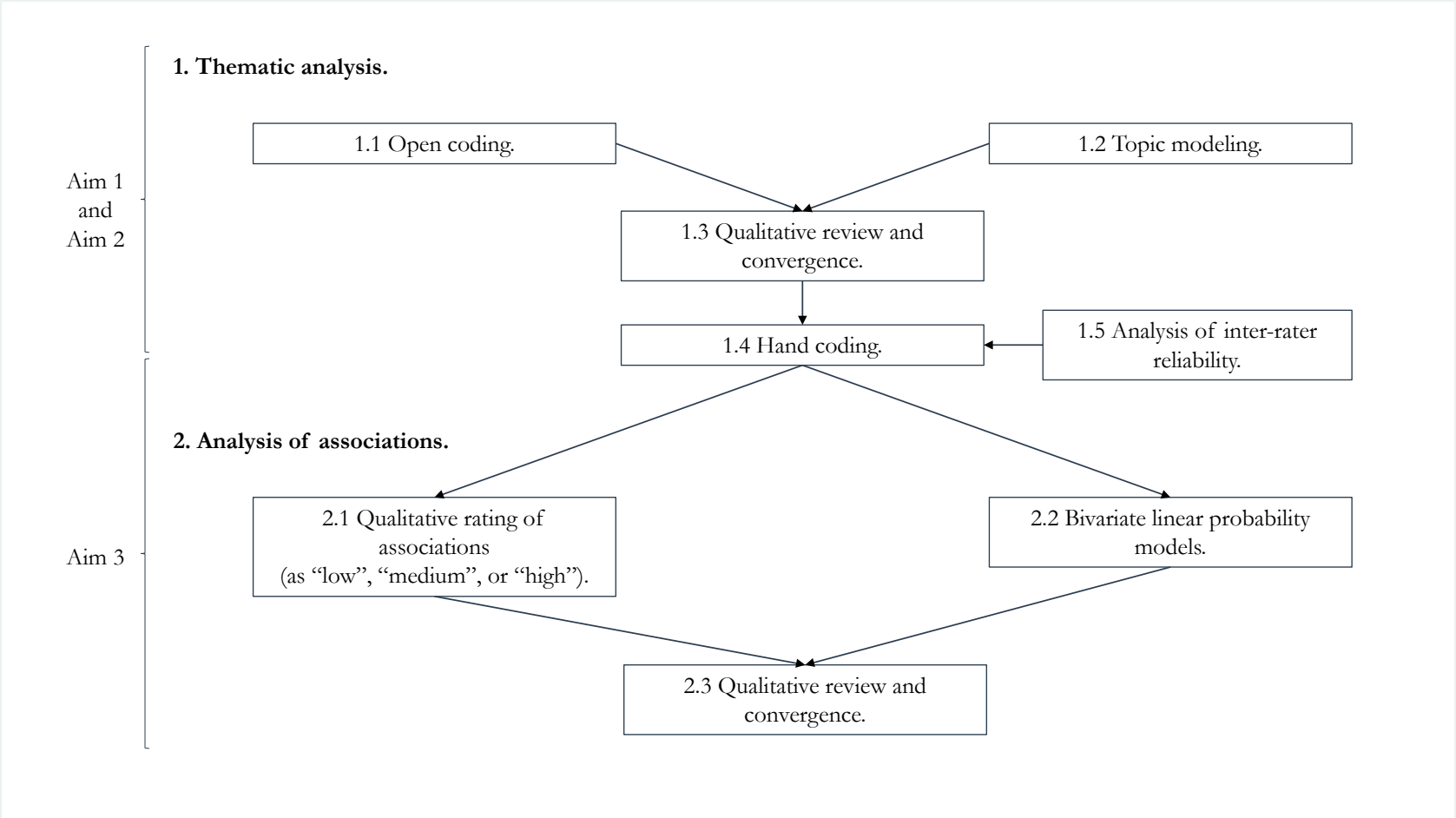
In semi-structured interviews, we asked about changes in instruction, and what triggered them

> *In the year before the COVID-19 crisis: Do you think you changed the way you (/your school's teachers) went about your (/their) day-to-day teaching in the classroom? If so, how?*

3/ Analytical strategy

At two stages, we compare results from a qualitative strategy with those from a quantitative strategy

Figure 2: Analytical strategy



Notes. This figure presents the study's mixed-methods data-analytic strategy along with the study's three main aims.

▸ Topic model

4/ Results

Teachers report changes in instruction, point to sharing of challenges, discussions as main driver

Table 2: Drivers of change in instruction

	n	% of excerpts		
		Overall	**By cadre**	
			Teachers	Other respondents
Primary drivers				
Sharing and discussing challenges	51	11.15	6.18	4.97
Acquisition of new skills and teaching methods	34	10.30	7.39	2.91
Verbal encouragement and/or discussions	36	7.03	2.30	4.73
Secondary drivers				
Learner outcomes	37	6.67	2.42	4.24
Materials (such as flipcharts and markers)	26	5.21	2.42	2.79
Frequent monitoring	29	4.97	1.09	3.88

Note. See Table 2 of the paper for the reported prevalence of change. This table presents the reported prevalence of drivers that provoked teachers to change their instructional behaviors. "Excerpts" refers to 825 excerpts in which respondents discussed such drivers of change in instructional behaviors. The first column shows the number of respondents that mentioned each driver. The remaining columns reflect the percentage of excerpts that pertain to various drivers (overall, and by respondent cadre). Codes with incidence rates lower than 5 percent are omitted. Totals may exceed 100% due to excerpts that refer to more than one cadre or denote more than one driver of change.

Skill acquisition co-occurs with off-site, sharing of challenges, discussion with on-site development

Table 3: Prevalence of professional development opportunities, their assoc. with main drivers of change

	Prevalence		Association with primary drivers of change								
			Sharing challenges			Verbal encouragement			Learning new methods		
			Qual.	Quant.		Qual.	Quant.		Qual.	Quant.	
	% Respondents	% Excerpts		Within 10	Within 20		Within 10	Within 20		Within 10	Within 20
Training											
Off-site training	38.46	10.97		-11.65	-14.98		10.80	15.95		7.81	13.53
On-site training	67.95	20.25		26.75	33.58		1.98	6.18		-2.79	3.38
Monitoring											
Monitoring through lesson observations	71.79	31.43		-9.29	-7.04		3.67	6.96		-2.17	3.38
Monitoring through file-checking	24.36	4.43		-7.32	0.84		-3.29	-3.86		-10.10	-8.76
Monitoring by walking-around	6.41	1.27		0.54	-4.38		-3.98	-0.07		-4.54	1.71
Mentoring											
Capacity building during 1:1 mentoring	55.13	14.98		5.49	15.26		9.80	9.05		5.82	11.59
Encouragement during 1:1 mentoring	24.36	6.96		-2.54	-0.16		5.11	17.58		-9.20	-11.60
Lesson planning support during 1:1 mentoring	16.67	3.59		-5.13	-10.88		8.57	12.85		-5.55	-6.19
Technology											
Mentoring over technology	29.49	5.27		-6.61	-10.74		n.a.	-11.77		-10.45	-11.21
Data use	28.21	5.49		-2.41	5.18		4.39	6.60		5.10	9.43

Note. This table shows the prevalence of professional development opportunities and their association with primary drivers of change in teaching behaviors. Professional development opportunities are shown in rows. "Prevalence" reports on the percentage of respondents and excerpts that relate a given professional development opportunity to changes in instruction. Under "Prevalence", "Excerpts" refers to 474 excerpts in which respondents discussed teacher professional development opportunities, given that a driver of change was mentioned in the interview. The quantitative (Quant.) component, reports the percentage point increase (decrease) in the probability of a driver being mentioned in an excerpt, if a professional development opportunity is mentioned within the neighborhood of ten or twenty excerpts, respectively. These "associations" are color coded, whereby green highlights positive, yellow highlights weak, and red highlights negative associations.Results from a quantitative analysis are shown with a continuous color scale. The qualitative (Qual.) component is shown in three discrete colors, only. Green indicates strong qualitative evidence of associations between each respective driver and its professional development opportunity. Orange indicates weak evidence and red indicates no evidence.

5/ Conclusion

Conclusion

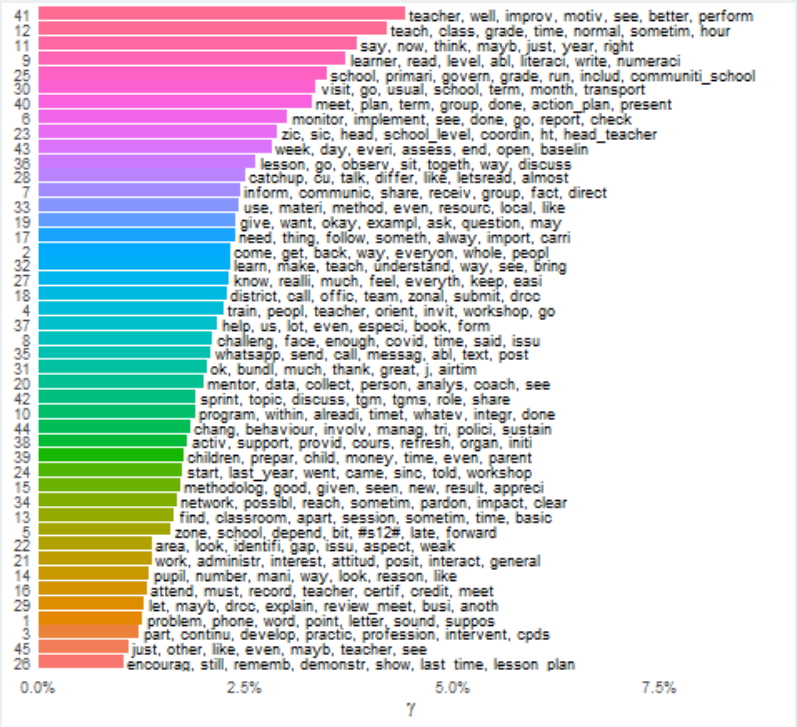
This is an **exploratory** study that highlights the potential of **school-based continuous professional development** as a means to alter instruction, in a low-resource context.

- It relies on teacher self-reports, with limited ability to identify causal effects.
- Describes what is; it cannot say what should be.
- Makes a minor contribution to mixed methods research, combining qualitative thematic analysis with unsupervised Machine Learning (topic modeling); qualitative analyses of associations with linear probability models.
- Informs a large-scale randomized trial, promoting teacher collaboration on “mastery challenges”—as a less costly alternative to roving mentors (results forthcoming in 2024-25).

6/ Appendix

We contrasted the results from qualitative open coding with those from topic modeling

Figure A1: Identification of themes through topic modeling



Notes. This figure presents the 45 themes identified through topic modelling. Themes are ordered by prevalence and presented along with their seven most distinctive terms. The corpus of text relies on all sentences spoken by respondents (5,879 answers); it excludes any text spoken by interviewers. Bi- and trigrams were added via Rapid Automatic Keyword Extraction (RAKE). The analysis excludes common stopwords (such as “me”, “my”, “myself”, “we”, or “our”), sets all text to lower case, and “stems” words (e.g., by removing suffixes such as “ed”, “ing”, or “ly”).

◂ Back

We contrasted the results from qualitative open coding with those from topic modeling (ctd.)

Table A1: Comparison of qualitatively identified themes with quantitatively identified themes

	Number of codes in qualitative coding framework	Number of topics in text analysis
Changes in teaching practices	27	2
Drivers of change	52	4
Professional development inputs	243	6
Training	73	1
Monitoring	78	1
Mentoring	55	3
Technology	16	1
Data use	21	0
Other categories	86	14
Nonsensical categories	-	19
Total	**408**	**45**

Note. This table presents the number of codes as per the qualitative coding framework and as per the quantitative text analysis, respectively. Each row represents a category. We focus on categories of codes that were included in the current study. "Other" categories represent unrelated codes, such as background information on the setting of a school. "Nonsensical" categories represent topics as per the quantitative text analysis that, after review, did not prove meaningful (e.g., topic 11 in Appendix Figure A1: say, now, think, mayb, just, year, right).

Back

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