

August, 18. 2026

TEACHER SHORTAGE ACROSS CONTEXTS:
GOVERNANCE, POLICY, AND LOCAL SENSE-
MAKING

ECER, Tampere 2026

PHBern

TEACHER SHORTAGE ACROSS CONTEXTS:

Making Sense of Teacher Shortages Across Governance Levels in Sweden

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**The impact of the employment of non-traditionally qualified teachers on the work of schools.
The perspective of Austrian school leaders.**

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Beyond Structural Determinism: Contextual and Organisational Conditions of Qualitative Teacher Shortage

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Pierre Tulowitzki, Discussant (University of applied sciences and arts northwestern Switzerland)

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BEYOND STRUCTURAL DETERMINISM:
CONTEXTUAL AND ORGANISATIONAL CONDITIONS
OF QUALITATIVE TEACHER SHORTAGE

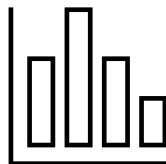
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FRAMEWORK

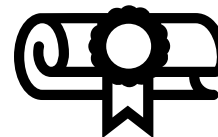
TEACHER SHORTAGE

Quantitative Shortage



***Number of unfilled teaching positions
(focus on ensuring compulsory schooling)***

Qualitative Shortage



Lack of adequately trained teachers

People without any teaching qualification and

- Career changers/lateral entrants
- students entering the profession early
- teacher outside their school level or subject area

(Porsch et al., 2025)

FRAMEWORK – EDUCATIONAL SYSTEMS IN SWITZERLAND

In Switzerland, responsibility for education lies with the cantons > **26 cantonal education systems**

MAKRO-LEVEL = canton of Bern, national context

Regulations: employment, salary, education certification

Measures: remuneration, additional payments, entry measures

INTERMEDIATE LEVEL = municipal authorities/ local context

- Geographical location
- Finances and financial decisions
- Politics
- Local labour market
- Employment decisions
- Structures for instruction
- Strategies and goals

MESO-LEVEL = school

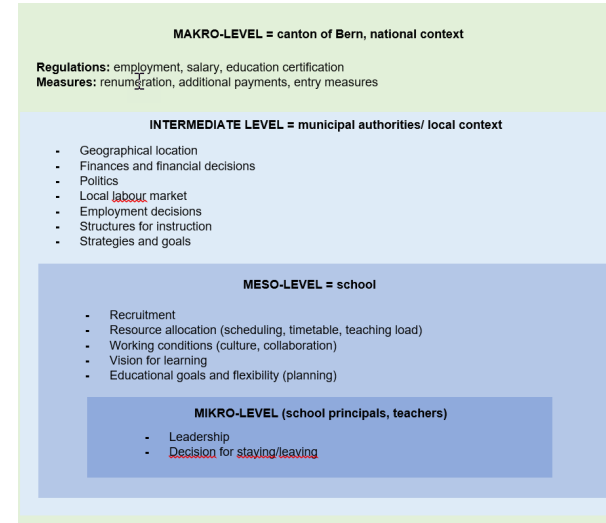
- Recruitment
- Resource allocation (scheduling, timetable, teaching load)
- Working conditions (culture, collaboration)
- Vision for learning
- Educational goals and flexibility (planning)

MIKRO-LEVEL (school principals, teachers)

- Leadership
- Decision for staying/leaving

FRAMEWORK – EDUCATIONAL SYSTEMS IN SWITZERLAND

- Multi-Level-Governance-Perspective
 - Teacher shortage interplay btw. cantonal regulation, intermediate/municipal and meso/school level (Hooghe & Marks, 2003; See et al., 2020)
 - Contextual factors (rural, socioeconomic) shape «hard to staff schools» (Dadvand & Lampert, 2024; Mills et al., 2024)
 - Organisational factors (leadership, mentoring, autonomy) further influence on turnover (Ingersoll, 2001; Borman & Dowling, 2008; Nguyen et al., 2020)



SWITZERLAND: 26 FEDERALLY ORGANIZED EDUCATION SYSTEMS

- Specifics of Bern as a cantonal education System
 - Teachers salaries are regulated at the cantonal level, → no financial autonomy for municipalities or schools (Jutzi & Mayland, 2024; Wolter et al., 2003)
 - Human resource management can be delegated to principals, municipalities retain a say (Education Act of the Canton of Bern, 2008; Hangartner & Heinzer, 2016)
 - No systematic external school evaluation system on cantonal level → high autonomy, low level of control (Steiner-Khamsi, 2025; Rühli, 2012)
 - Increasing use of **Teachers without a teaching diploma** as a class and subject teacher
 - Different cantonal practices regarding fixed-term contracts and wage deductions (Education Report 2026, p. 51)
 - Canton BE: approved, no time limit, requirement for catch-up training under the responsibility of the principal
- Risk of competition for qualified personnel even with decreasing quantitative shortages (see reference scenarios Federal Statistical Office (FSO), 2025)

Kantone	Obligatorische Schule
AG	
AI	
AR	
BE-d	
BE-f	
BL	
BS	
FR-d	
FR-f	
GE	
GL	
GR	
JU	
LU	
NE	
NW	
OW	
SG	
SH	
SO	
SZ	
TG	
TI	
UR	
VD	
VS-d	
VS-f	
ZG	
ZH	

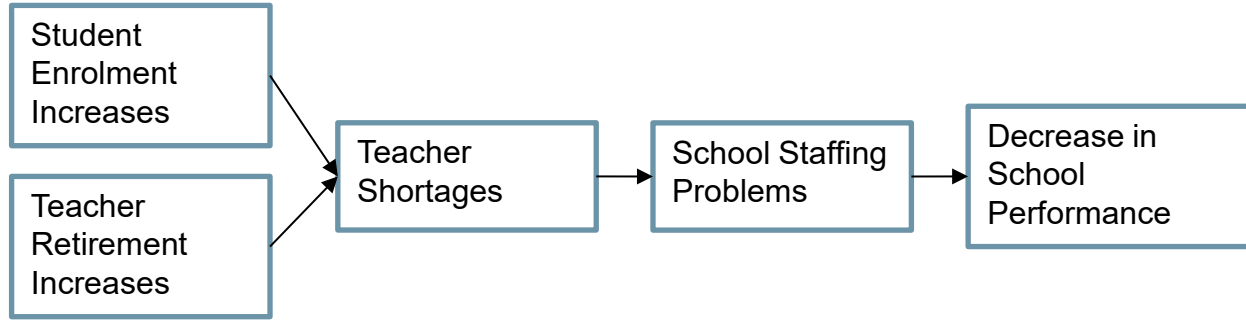
- mit befristeter Anstellung und Lohnabzug zugelassen
- mit befristeter Anstellung zugelassen
- mit Lohnabzug zugelassen
- nicht zugelassen

STATE OF RESEARCH

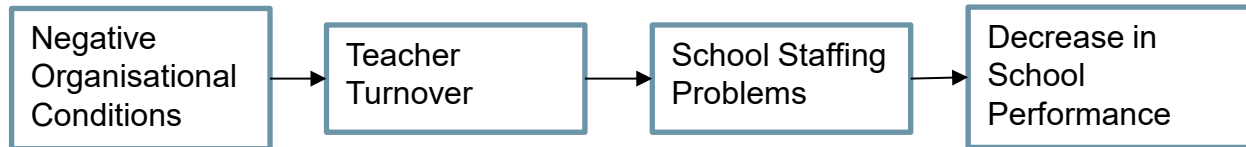
- Contextually different causes at different levels
 - Decline in qualified teachers, high turnover, attrition, professional prestige (Doughty, 2024, Gundlach et al. 2024, Sutchet al. 2019)
 - Contextual conditions (local labor market), «local sense-making», «grow your own» (McHenry-Sorbian & Campbell, 2019; Nguyen & Springer, 2023; Shaoan et al., 2025)
 - School characteristics, school culture, working conditions, leadership (Gundlach, 2025; Jerrim, 2025; Lochmiller et al. 2024)
- National and international variations in teacher shortage but the interplay of **contextual conditions** versus **school-specific organizational conditions** remains unclear in research on teacher shortage

CAUSES AND CONSEQUENCES OF SCHOOL STAFFING PROBLEMS

Contemporary Education Theory



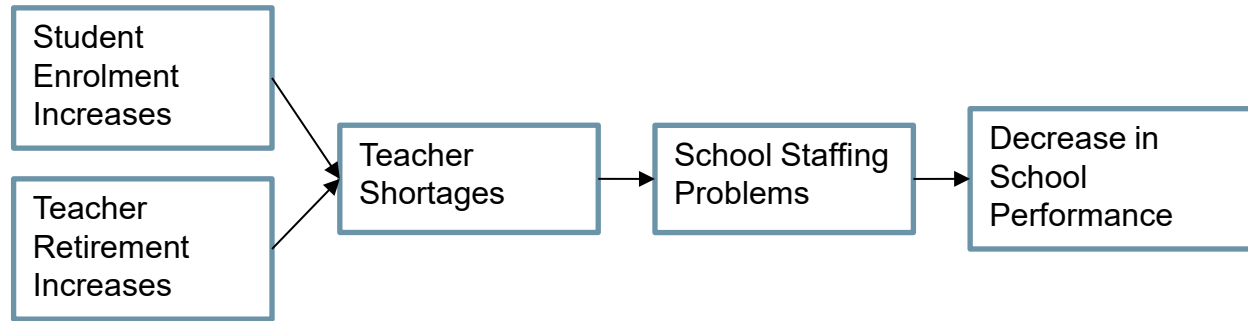
Organisational Perspective



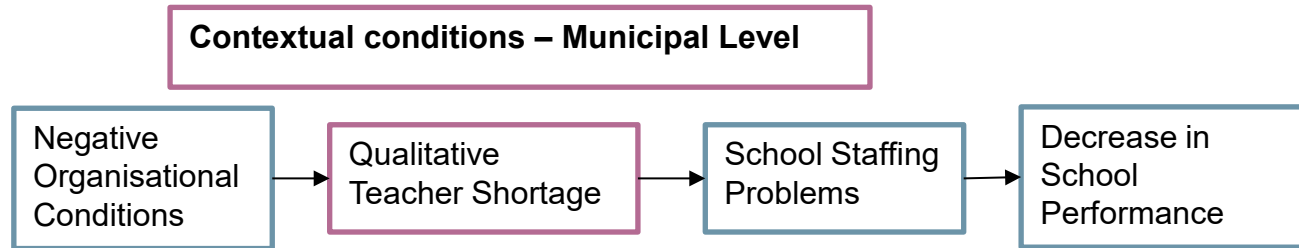
(Ingersoll, 2001)

CAUSES AND CONSEQUENCES OF SCHOOL STAFFING PROBLEMS

Contemporary Education Theory



Contextual and Organisational Perspective



RESEARCH QUESTION AND DESIGN **OF THE RESEARCH PROJECT «LEIF»**

RESEARCH QUESTION

RQ1 – Municipal Context

To what extent do contextual conditions explain differences in the average qualitative teacher shortage across municipalities (operationalized as the proportion of unqualified teachers)?

RQ2 – School organization (outlook)

Within municipalities, are personnel-management and perceived autonomy associated with school-level unqualified teacher ratio or perceived strain?

SAMPLE**Online-survey for school principals**

Total sample (N)	333
Completely or partially completed Questionnaires (n)	193
Response rate	57.9%

→ Link to federal/cantonal data (tax revenue, educational levels, social assistance rate, urban-rural typology)

VARIABLES

Teacher shortage:

- **unqualified-teacher ratio:** No. of teachers without any teaching qualification by school
- **perceived strain of shortage on instructional quality:** principal's perceived impact of qualitative shortage on teaching quality on a scale 1-5

Measured at school level, aggregated for municipal level

Contextual conditions:

- Fiscal capacity (HEI 2024)
- Share of population with tertiary education (ISCED 5–8; 2023)
- Share of social assistance recipients (2024)
- Urban–rural classification (2021)
- School Social Index (SSI)
- Cross-border exposure
- Distance to border

School-specific organisational conditions:

- A personnel-management scale
- Perceived autonomy, single item

ANALYSIS

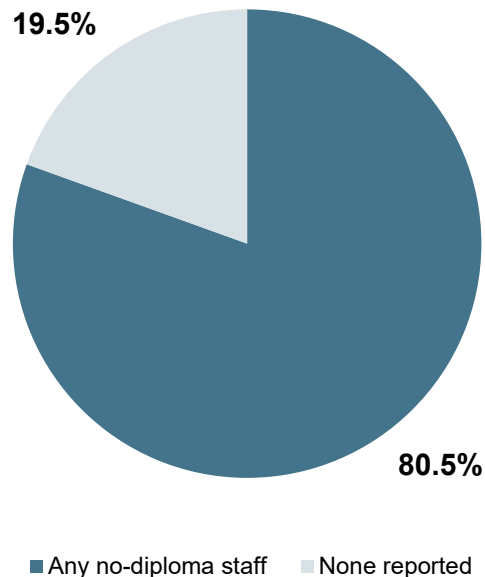
	RQ1: Between municipalities	RQ2: Within municipalities
<i>Analytical sample</i>	139 municipalities	57 schools in 22 municipalities
<i>Outcome</i>	Unqualified teacher ratio	Unqualified teacher ratio and perceived strain
<i>Comparison</i>	Differences between municipalities	Differences between schools in the same municipality
<i>Model</i>	School-count-weighted OLS	Municipality fixed-effects OLS
<i>Uncertainty</i>	HC3 robust standard errors	CR2 cluster-robust SE and Satterthwaite tests
<i>Interpretation</i>	Percentage-point difference per 1-SD increase	Organisational predictors per scale point; staffing share per +10 pp

RESULTS

TEACHERS WHO ARE NOT ADEQUATELY TRAINED ARE WIDESPREAD AND UNEVEN

Statistic	Result
Valid observations	190
Mean (SD), %	10.1 (10.8)
Median, %	7.3
Range	0-70%
Any teachers not adequately trained	80.5%

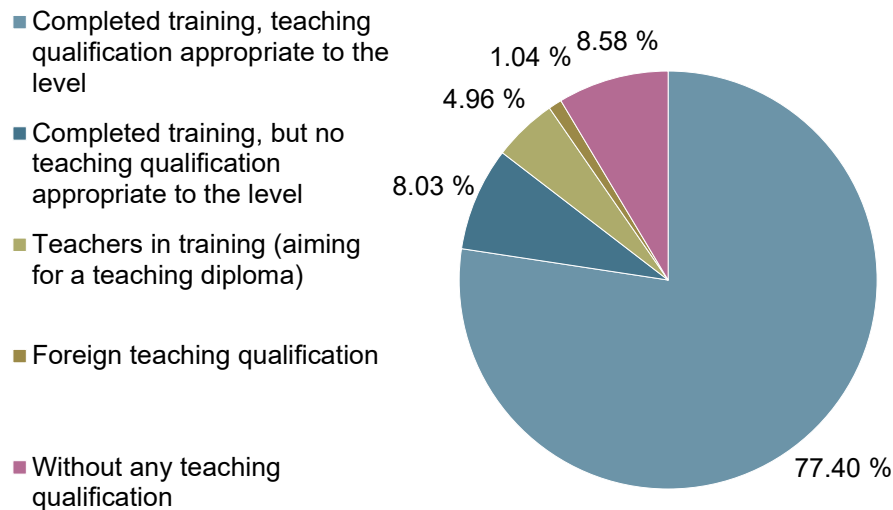
Schools employing teachers that are not adequately trained



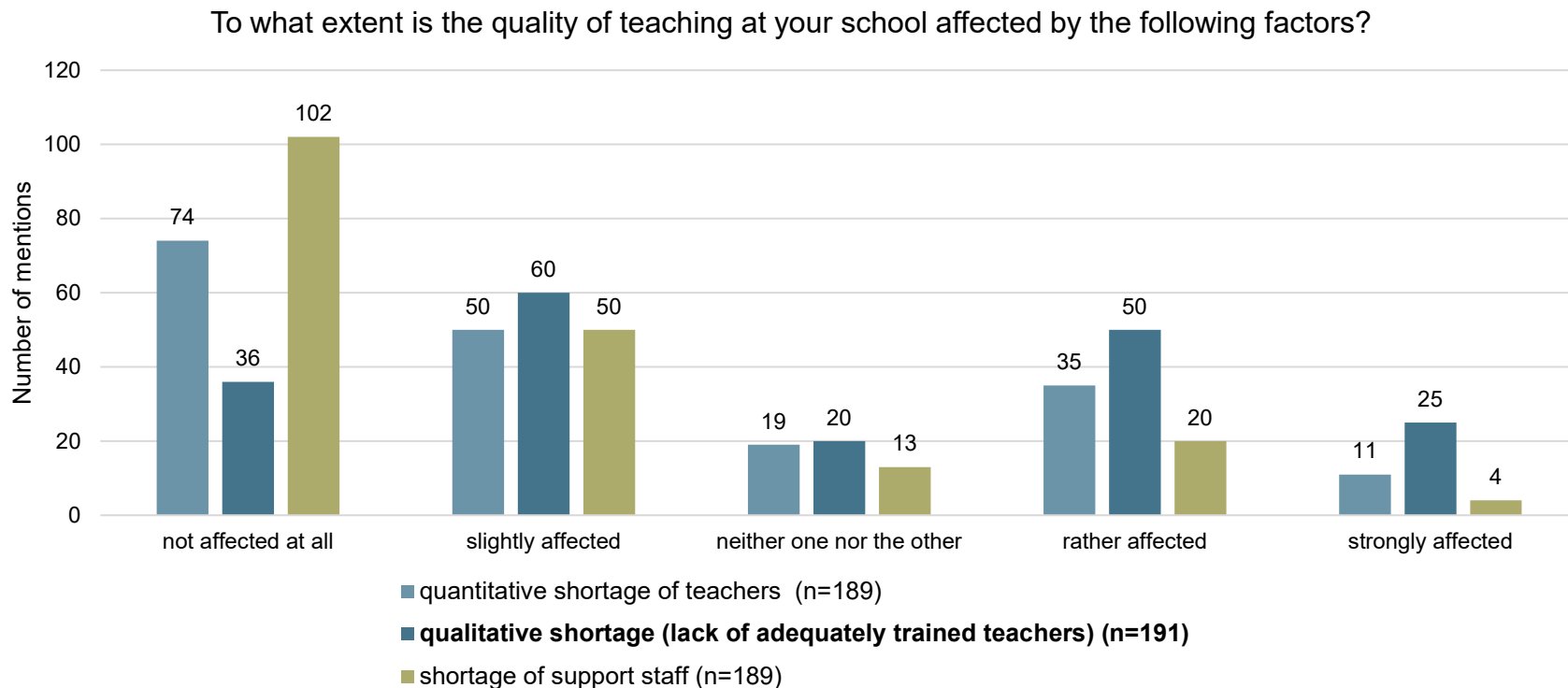
UNQUALIFIED-TEACHER RATIO: COMPOSITION OF SCHOOL STAFF

Qualification status	Number persons
Completed training, teaching qualification appropriate to the level	4774
Completed training, but no teaching qualification appropriate to the level	495
Teachers in training (aiming for a teaching diploma)	306
Foreign teaching qualification	64
Without any teaching qualification	529
Total number of teachers at the surveyed schools	6168

Composition of school staff



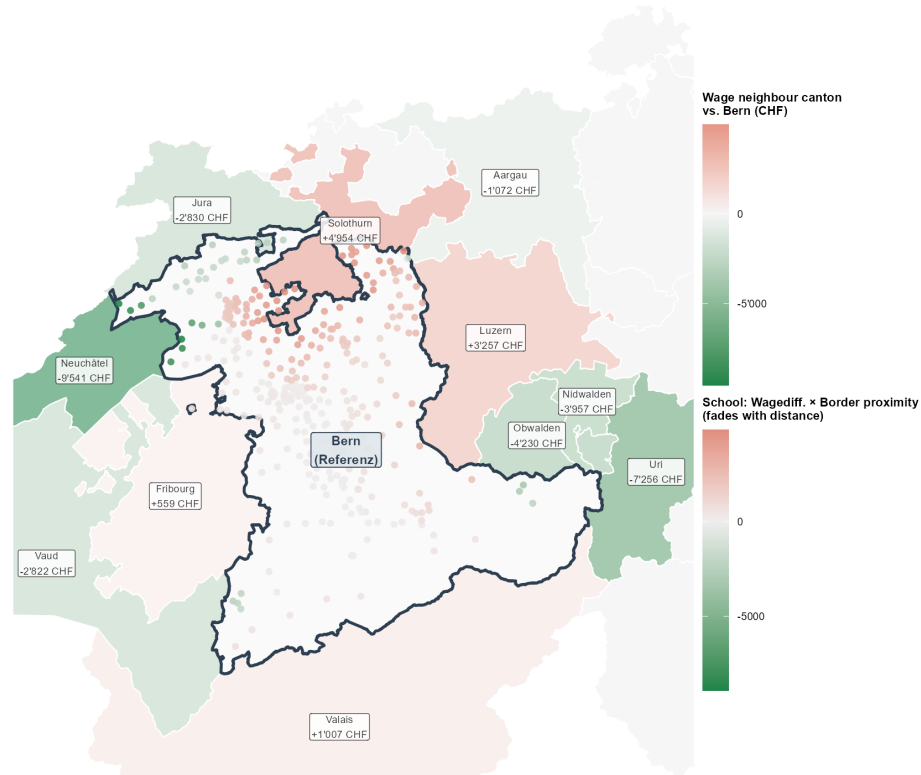
PERCEIVED STRAIN OF SHORTAGE ON INSTRUCTIONAL QUALITY



FISCAL COMPETITION

Wage pressure for schools in Canton Bern

Canton: Wage difference to Bern | School points: weighted by border proximity



Sources: Cantonal Wages; SwissBoundaries3D

DISTRIBUTION OF CONTEXTUAL AND ORGANISATIONAL PREDICTORS

Predictor	N	M	SD	Min	Max	%
School-specific organisational conditions						
Perceived autonomy (1–5)	57	2.67	0.89	1.00	4.00	—
People management (1–5)	57	3.77	0.45	2.80	4.50	—
Contextual determinants						
Fiscal capacity (HEI)	139	89.40	35.11	50.91	399.43	—
Population with tertiary education (%)	139	34.47	8.58	17.00	63.00	—
Social-assistance recipients (%)	139	1.97	1.91	0.00	9.10	—
School Social Index	139	1.20	0.15	1.00	1.70	—
Feasible higher-wage exposure (raw index)	139	3.18	2.42	0.00	8.82	—
Straight-line distance to nearest higher-wage cantonal border (km)	139	9.53	6.08	0.29	24.56	—
Straight-line distance to any Bern cantonal border (km)	139	8.97	5.74	0.29	23.06	—
Distance to nearest cantonal road crossing (km)	139	9.90	6.31	0.59	27.38	—
Urban–rural: Urban	36	—	—	—	—	25.9
Urban–rural: Intermediate	41	—	—	—	—	29.5
Urban–rural: Rural	62	—	—	—	—	44.6

Note. School characteristics statistics refer to the exploratory within-municipality regression sample; municipal statistics refer to the primary analytical municipality sample. Exposure is shown on its raw index scale; continuous predictors are standardized only for the regression models.

RESULTS – RQ1 CONTEXTUAL CONDITIONS

	(1) Context	(2) Crossing time	(3) Higher-wage border	(4) Any boundary	(5) Wage exposure
Socioeconomic and settlement context					
Fiscal capacity (log HEI, z)	2.241 (2.189)	2.233 (2.233)	2.246 (2.202)	2.128 (2.199)	1.952 (2.175)
Tertiary education share (z)	-2.047 (1.722)	-2.059 (1.746)	-2.051 (1.739)	-1.970 (1.715)	-1.877 (1.723)
Social-assistance share (z)	-0.959 (1.455)	-0.968 (1.467)	-0.962 (1.466)	-0.928 (1.454)	-0.925 (1.433)
School Social Index (z)	2.220 (2.205)	2.186 (2.231)	2.206 (2.253)	1.954 (2.216)	2.469 (2.190)
Intermediary municipality	3.728 (3.084)	3.656 (3.090)	3.686 (3.189)	3.059 (3.120)	3.730 (3.059)
Rural municipality	8.542 (4.691)	8.457 (4.743)	8.497 (4.911)	7.729 (4.780)	8.644 (4.663)
Spatial and boundary conditions					
OSRM travel time to fastest road crossing (z)	—	-0.191 (0.845)	—	—	—
Straight-line distance to higher-wage border (z)	—	—	-0.079 (0.870)	—	—
Straight-line distance to any Bern boundary (z)	—	—	—	-1.058 (0.753)	—
Feasible wage exposure (z)	—	—	—	—	-1.273 (0.972)
Model information					
Municipalities	139	139	139	139	139
R ²	0.175	0.176	0.175	0.184	0.187
Adjusted R ²	0.138	0.132	0.131	0.140	0.143

THE RURAL DIFFERENCE REMAINS LARGE BUT IMPRECISE

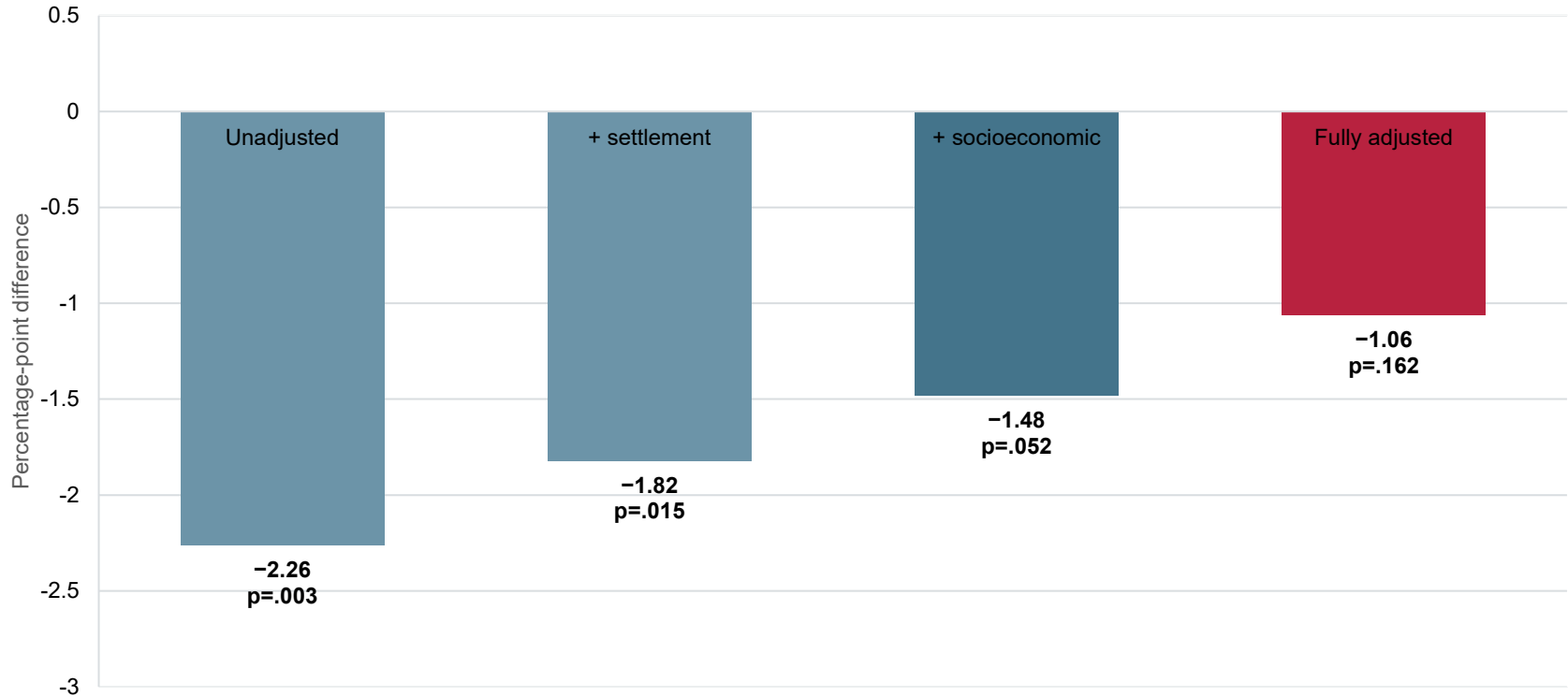
Difference from urban municipalities in the employment of teachers who are not adequately trained

Settlement type	Model	B	HC3 SE	95% CI	p
Rural	Unadjusted	+6.87	2.00	[2.95, 10.79]	< .001
Rural	Adjusted	+8.54	4.69	[-0.65, 17.74]	.071

B and 95% CI are percentage-point differences. The adjusted model includes the municipal contextual covariates; urban municipalities are the reference category.

BOUNDARY GRADIENT ATTENUATES WITH MUNICIPAL CONTEXT

Share of teachers who are not adequately trained per 1 SD farther from any Bern border



RESULTS – EXPLORATORY RQ2

- Estimates of the school-specific organisational conditions remain inconclusive
- $n = 57$ school located in 22 municipalities with two or more participating schools
- Share of teachers without any qualification: people management $B = 1.81$ ($SE = 1.32$); autonomy $B = 0.19$ ($SE = 0.78$); within $R^2 = .016$
- Perceived strain: people management $B = 0.24$; autonomy $B = -0.06$; +10 pp no-diploma share $B = 0.11$; within $R^2 = .010$

CONCLUSION

- Qualitative teacher shortage vary substantially within an educational system
 - Rural municipalities show a sizeable contextual difference; the adjusted estimate remains imprecise.
 - Generic border proximity marks a broader municipal gradient, much of which overlaps with measured context.
 - Targeted wage-linked measures provide no evidence of a cross-cantonal wage-pull mechanism.
- Associations with school organisational conditions remain unresolved in the smaller within-municipality sample.

=> Adapted model (Ingersoll, 2001) has some relevance for explaining qualitative teacher shortage, yet further research is needed to disentangle the complex interplay of school-specific organisational conditions and contextual conditions

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