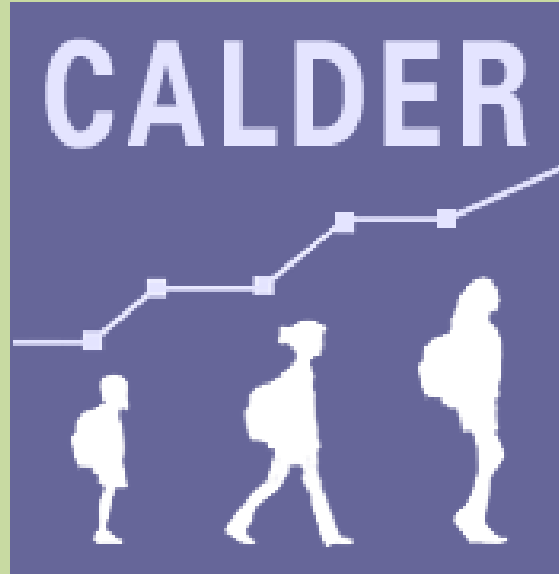


National Center for Analysis of Longitudinal Data in Education Research



Principal Effectiveness and Leadership in an Era of
Accountability: What Research Says

3rd Annual CALDER Conference

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What Makes For a Good Teacher and Who Can Tell?

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Background



- Growing Interest in Linking Teacher Performance and Compensation
 - “Value Added” scores based on performance of a teacher’s students have limitations
 - Only available for teachers in tested subject (reading and math)
 - Subject to measurement error and inter-temporal instability
- Movement to Grant Principals Greater Autonomy in Personnel Decisions
 - Charter schools
 - School reform in New York City



Research Questions

- Do principals' evaluations of teachers contain information beyond readily-observable "objective" teacher characteristics?
- What factors determine a principal's overall evaluation of her teachers?
- Can principals do as well (or better) at predicting future teacher value added than past performance measures?

Literature Review



- Early Literature
 - Murnane (1975)
 - Conditioning on student characteristics and prior achievement, a one-standard-deviation increase in principal's rating is associated with a 0.125 standard deviation increase in student third-grade math scores
 - Peterson (1987, 2000)
 - Finds weak correlation between principal ratings of teachers and parent or student satisfaction
 - Milanowski (2004), Kimball, et al. (2004), White (2004)
 - Comparisons of principals' four-point teacher evaluation scales with single-year estimates of teacher value added
 - Generally find weakly positive correlation between principal evaluations and estimated teacher quality (correlation = 0.2 - 0.4)

Literature Review



- Recent Literature

- Jacob and Lefgren (2005, 2008)

- Find principals good at identifying best and worse teachers, but less able to distinguish teachers in the middle
- Prior teacher value-added better at predicting current teacher value-added than contemporaneous principal evaluations of teachers, though principal evaluations do contribute additional information over and above prior value-added measures
- Principal evaluations better at predicting parental requests for teachers than teacher value-added scores



Data

- Anonymous mid-sized school district in Florida
 - Schools serve a diverse set of student populations
 - Free/Reduced-Price Lunch: 5-90%
 - Percent Minority: 10-90%
- Longitudinal student-level achievement data
 - Grades 1-10
 - 1999/00 through 2007/08
 - Math and reading scores on the Stanford Achievement Test

Data



- Principal Interviews
 - In-person interviews conducted in Summer 2006
 - Single-blind evaluation of up to 10 teachers per school (5 per subject)
 - Random sample of teachers at school who taught at least three classes in the tested grades and subjects during 1999/00-2004/05
 - 9-Point Rating Scale
 - Not effective (1-3): performance is substantially below minimum standards
 - Adequate: (4-6): meets standards but can improve in several areas.
 - Exceptional (7-9): teacher is among the best I have seen
 - Asked to evaluate teachers on:
 - Overall performance
 - Ability to raise test scores
 - Specific characteristics

Sample Student and Teacher Characteristics



	<u>Math</u>	<u>Reading</u>
Total Students	31,645	30,794
Total Teachers	1,023	1,024
Principals Interviewed	30	30
Teachers Rated by Principal	237	231

Sample Teacher Grade Levels and Principal Ratings



Math

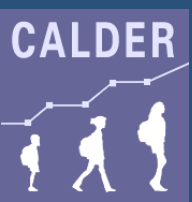
Reading

Teachers

Taught Primarily Elementary School	0.727	0.729
Taught Primarily Middle School	0.149	0.141
Taught Primarily High School	0.124	0.130

Mean Principal Rating of Teacher

Overall	7.084	7.134
Ability to Raise Test Scores	7.200	7.184
“Caring”	7.384	7.463
“Enthusiastic”	7.249	7.372
“Motivated”	7.414	7.481
“Strong Teaching Skills”	7.544	7.636
“Knows Subject”	7.848	7.918
“Communication Skills”	7.612	7.758
“Intelligence”	7.911	7.970
“Positive Relationship with Parents”	7.483	7.600
“Positive Relationship with Students”	7.636	7.739



Value-Added Estimation Procedure



- Estimate Student Achievement Model
 - Includes student, teacher and school fixed effects
 - Estimated teacher effects yield within-school measure of teacher effectiveness
- Construct Empirical Bayes “Shrunken” Teacher Effects
 - Given measurement error in student test scores, value-added estimates tend to be “noisy” measures of teacher productivity
 - Empirical Bayes estimates are essentially a weighted average of the individual-teacher-effect estimates and the average teacher effect estimate, with greater weight given to the individual estimates the more precisely they are estimated
 - For example, teachers with few students would have less precise estimates and would be “down weighted” or “shrunken” toward the mean teacher effect

Ordinary Least Squares Estimates of the Relationship Between Principal Ratings and Estimated Teacher Effectiveness, Controlling for Observed Teacher Characteristics



	Math		Reading	
	[1]	[2]	[1]	[2]
Overall Rating	2.374*** (4.50)		0.858*** (3.26)	
Ability to Raise Test Scores		2.199*** (3.83)		0.845*** (2.94)
R-squared	0.117	0.126	0.060	0.061
No. of Observations	237	202	231	201



OLS Estimates of the Relationship Between Principal Ratings and Estimated Teacher Effectiveness, Controlling for Observed Teacher Characteristics – By Grade Level



	Math		Reading	
	[1]	[2]	[1]	[2]
Overall Rating Elementary	2.956*** (4.91)		1.072*** (3.53)	
Overall Rating Middle/High	0.524 (0.49)		0.232 (0.45)	
Ability to Raise Test Scores 1.210** Elementary		2.967** (4.51)		(3.52)
Ability to Raise Test Scores Middle/High		0.059 (0.05)		0.015 (0.03)
R-squared	0.132	0.149	0.069	0.079
No. of Observations	237	202	231	201





Factor Loadings of Normalized Principal Ratings (Math)

Teacher Characteristic Rated by Principal	Interpersonal Skills	Motivation/Enthusiasm	Works Well With Others	Knowledge/Skills/Intelligence
Intelligent	-0.0481	0.0839	0.0606	0.7067
Works Well With Grade Team/Dept.	-0.0046	-0.0887	0.9711	0.0399
Works Well With Me (Principal)	0.1743	0.0835	0.7415	-0.0814
Positive Relationship With Parents	0.7231	0.0781	0.0768	0.0742
Positive Relationship With Students	0.9408	0.0103	-0.0131	0.0636
Caring	0.5591	0.1372	0.2422	-0.0185
Enthusiastic	0.1086	0.9721	-0.0707	-0.0035
Motivated	0.0398	0.5224	0.2802	0.1624
Strong Teaching Skills	0.1512	0.0258	-0.0462	0.8471
Knows Subject	-0.0088	-0.0551	-0.0036	0.9831
Communication Skills	0.1040	0.1705	0.2734	0.3191



Factor Loadings of Normalized Principal Ratings (Reading)

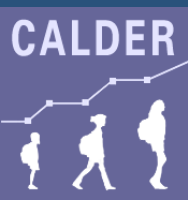
Teacher Characteristic Rated by Principal	Interpersonal Skills	Motivation/Enthusiasm	Works Well With Others	Knowledge/Skills/Intelligence
Intelligent	-0.0138	0.0094	0.0445	0.7064
Works Well With Grade Team/Dept.	-0.0179	-0.0581	0.8646	0.0704
Works Well With Me (Principal)	0.1507	0.0409	0.8251	-0.0558
Positive Relationship With Parents	0.7559	0.0511	0.0637	0.0741
Positive Relationship With Students	0.9195	0.0258	0.0181	0.0287
Caring	0.5970	0.0989	0.2610	-0.0385
Enthusiastic	0.0728	0.9942	-0.0476	-0.0225
Motivated	0.0728	0.5289	0.1894	0.2529
Strong Teaching Skills	0.2269	0.0127	-0.0854	0.8175
Knows Subject	-0.0814	-0.0201	0.0333	0.9840
Communication Skills	0.1484	0.2225	0.1855	0.3214



Pairwise Correlation of Principal's Ratings of Teachers With Teacher Characteristic Factors (Math)

	Overall Rating	Ability to Raise Test Scores	Inter-personal Skills	Motivation / Enthusiasm	Works Well With Others	Knowledge / Teaching Skills/Intelligence
Overall Rating	1					
Ability to Raise Test Scores	0.733**	1				
Interpersonal Skills	0.703**	0.550**	1			
Motivation/Enthusiasm	0.738**	0.596**	0.734**	1		
Works Well With Others	0.762**	0.598**	0.756**	0.732**	1	
Knowledge/Teaching Skills/Intelligence	0.881**	0.752**	0.612**	0.682**	0.644**	1

** Significant at the 0.05 level

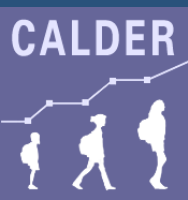




Pairwise Correlation of Principal's Ratings of Teachers With Teacher Characteristic Factors (Reading)

	Overall Rating	Ability to Raise Test Scores	Inter-personal Skills	Motivation/Enthusiasm	Works Well With Others	Knowledge / Teaching Skills/ Intelligence
Overall Rating	1					
Ability to Raise Test Scores	0.741**	1				
Interpersonal Skills	0.709**	0.626**	1			
Motivation/Enthusiasm	0.697**	0.569**	0.716**	1		
Works Well With Others	0.723**	0.589**	0.763**	0.676**	1	
Knowledge/ Teaching Skills/ Intelligence	0.856**	0.702**	0.632**	0.684**	0.650**	1

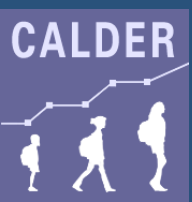
** Significant at the 0.05 level





OLS Estimates of the Determinants of the Principal's Overall Rating of Teachers

	Math		Reading	
	[1]	[2]	[1]	[2]
Ability to Raise Test Scores	0.733*** (14.59)		0.730*** (15.18)	
Ability to Raise Test Scores Elementary	0.755*** (12.95)		0.771*** (13.33)	
Ability to Raise Test Scores Middle/High	0.670*** (6.95)		0.637*** (7.26)	
R-squared	0.539	0.540	0.564	0.568
No. of Observations	202	202	201	201



OLS Estimates of the Determinants of Principals' Overall Rating of Teachers



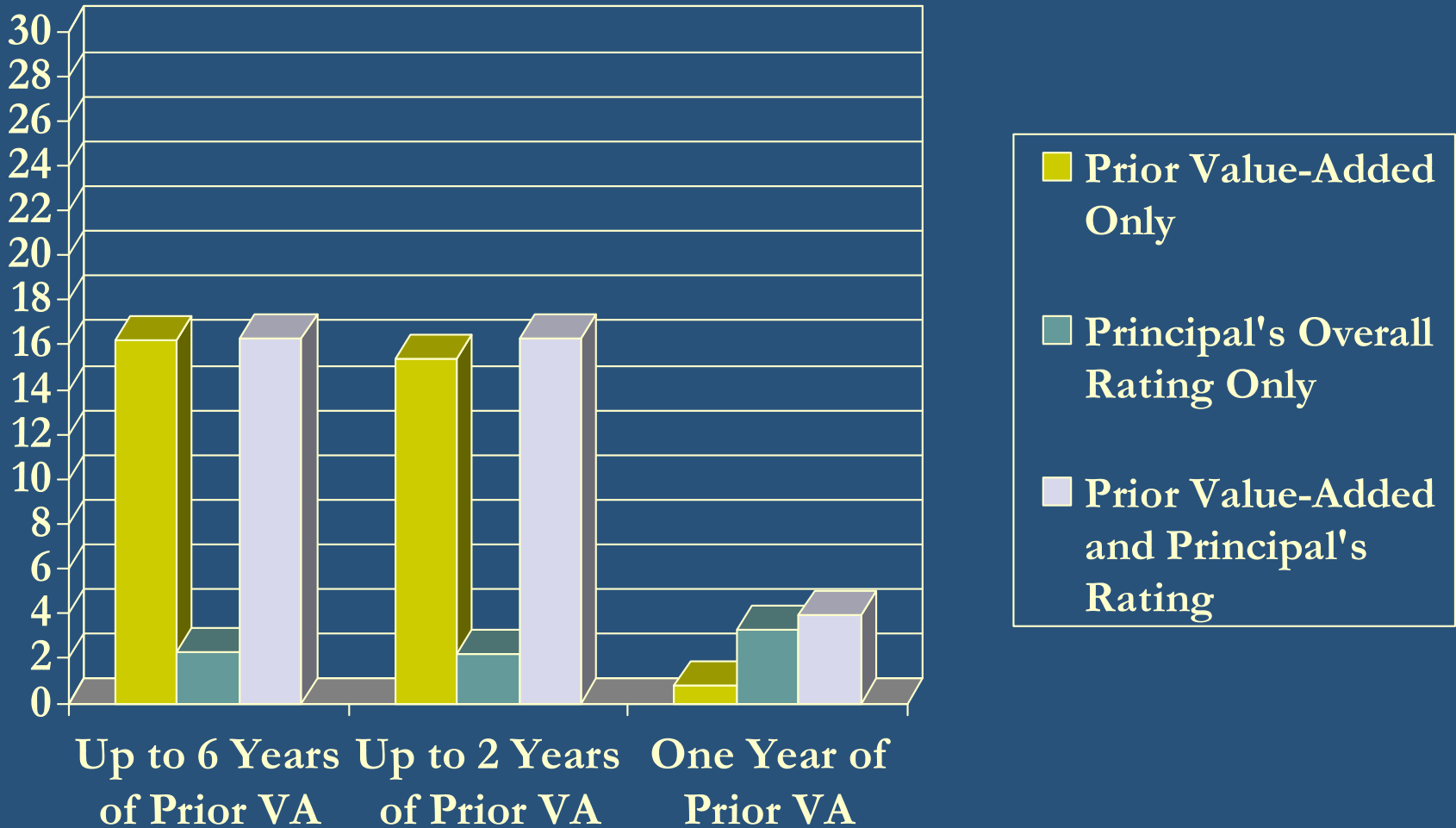
	Math	Reading
Interpersonal Skill	0.096** (2.05)	0.187*** (3.32)
Intelligence/Knowledge/Teaching Skills	0.609*** (15.36)	0.601*** (12.57)
Motivation/Enthusiasm	0.054 (1.19)	0.024 (0.46)
Works Well With Others	0.233*** (4.94)	0.156*** (2.88)
R-squared	0.852	0.805
No. of Observations	207	203

OLS Estimates of the Determinants of Estimated Teacher Effectiveness

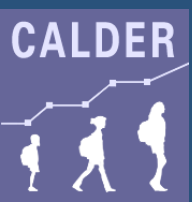
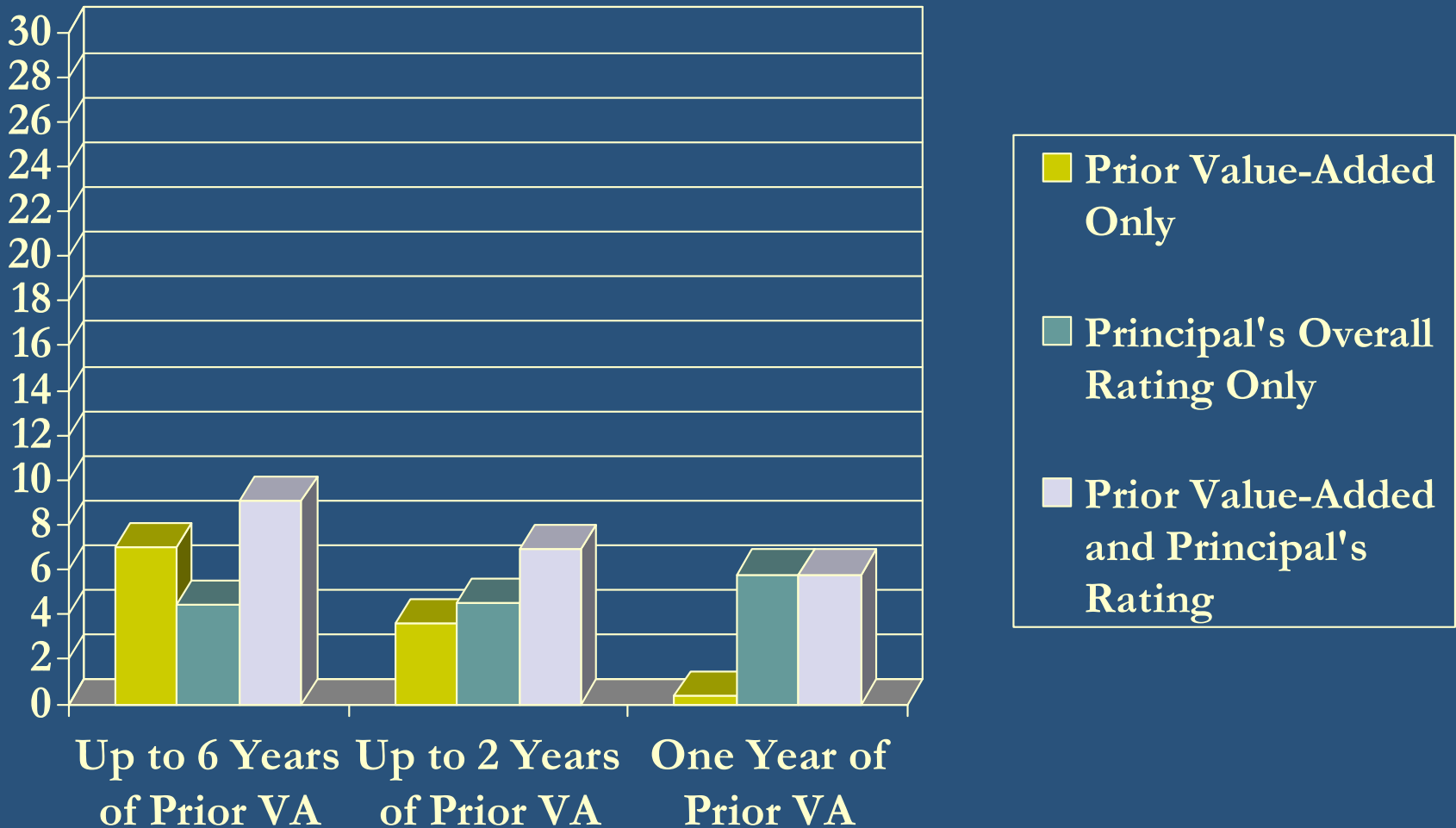


	Math	Reading
Interpersonal Skill	0.751 (0.79)	0.276 (0.55)
Intelligence/Knowledge/Teaching Skills	1.792** (2.23)	0.783* (1.83)
Motivation/Enthusiasm	-0.105 (0.11)	0.280 (0.60)
Works Well With Others	0.143 (0.15)	-0.534 (1.11)
R-squared	0.128	0.069
No. of Observations	207	203

Percentage of Variation in Estimated Teacher Effectiveness Explained by Prior Value Added and Principal's Overall Rating - Math



Percentage of Variation in Estimated Teacher Effectiveness Explained by Prior Value Added and Principal's Overall Rating - Reading



Summary



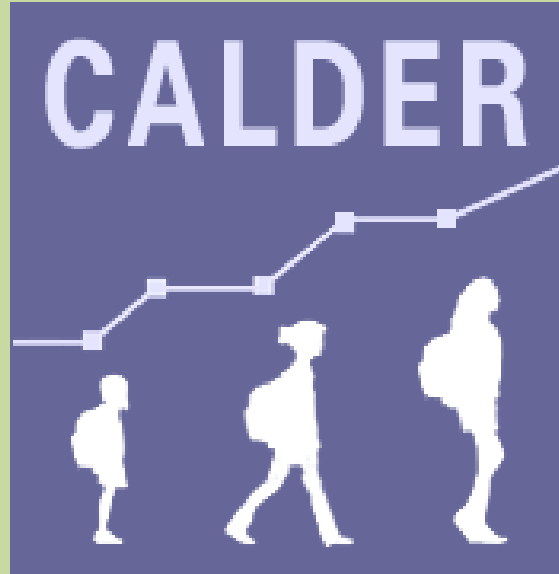
- Principal ratings of teachers predict teacher value-added even after controlling for observable teacher characteristics (experience, educational attainment and certification status)
- Principal ratings most strongly influenced by perceived intelligence/teaching skill/subject-area knowledge of teachers, but also influenced by perceived interpersonal skills and ability to work with others
- Only a teacher's perceived intelligence/knowledge/teaching skill is significantly correlated with teacher value-added
- Relative ability of principal ratings to predict future value-added depends on information used to construct prior value-added and subject matter
 - The more years of data used to construct past value-added, the less the relative contribution of principal ratings to predicting future value added
 - Past value-added a much better predictor of future value-added in math

Policy Implications



- Possibly greater role for principals in evaluating teachers with respect to retention and pay decisions
 - Particularly in cases where relatively little prior value-added information is available, principal ratings may add information
 - Early-career teachers
 - Merit systems based solely on current-year test scores
 - Caveat: ratings may change in “high stakes” environment
- Possibly greater emphasis on teaching skills/knowledge in teacher preparation and professional development

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