



Missing Elements in the Discussion of Teacher Shortages October 23, 2015

CALDER Explainers are designed to succinctly describe empirical research on contemporary topics in education and encourage evidence-based policymaking.

This CALDER explainer reviews recent reporting of teacher shortages and how the current narrative excludes important issues about the production of new teachers and the factors that impact teacher attrition.

Background:

The start to the new school year brought about a flood of reporting on a shortage of teachers. The issue was covered nationally by [NPR](#) and the [New York Times](#) and locally in [California](#) and [Oklahoma](#).

Many of these pieces offered similar diagnoses of the teacher shortage: Teachers, after years of fighting with policymakers over tenure, pay, and evaluation systems were leaving the profession. Prospective teachers, intimidated by these fights and facing increasing costs of a college education, were enrolling in programs other than teacher preparation at colleges and universities. And the improving economy was opening up new job opportunities for both current and would-be teachers.

Some reporting captured the nuances of teacher labor market issues by highlighting schools and subject areas that are difficult to staff and presenting data showing that the nationwide teacher to student ratio has [slightly decreased](#) over the past decade. But many readers were left with a very basic conclusion: there aren't enough teachers to teach all of the nation's children.

This conclusion doesn't capture broader issues of teacher production, or the many ways that policy influences the schools in which teachers choose to teach, where they move after becoming teachers, and how long they stay in the profession. Without consideration of these different factors, policy solutions are not clear.

Framing the Issue: What We Know About the Production of New Teachers

Reports on the current "teacher shortage" often begin by citing diminishing enrollment in teacher preparation programs in recent years. While these numbers are correct, looking only at the most recent years hides two important points: (1) the production of teachers is cyclical, and (2), overall, production has grown steadily since the mid-1980s.

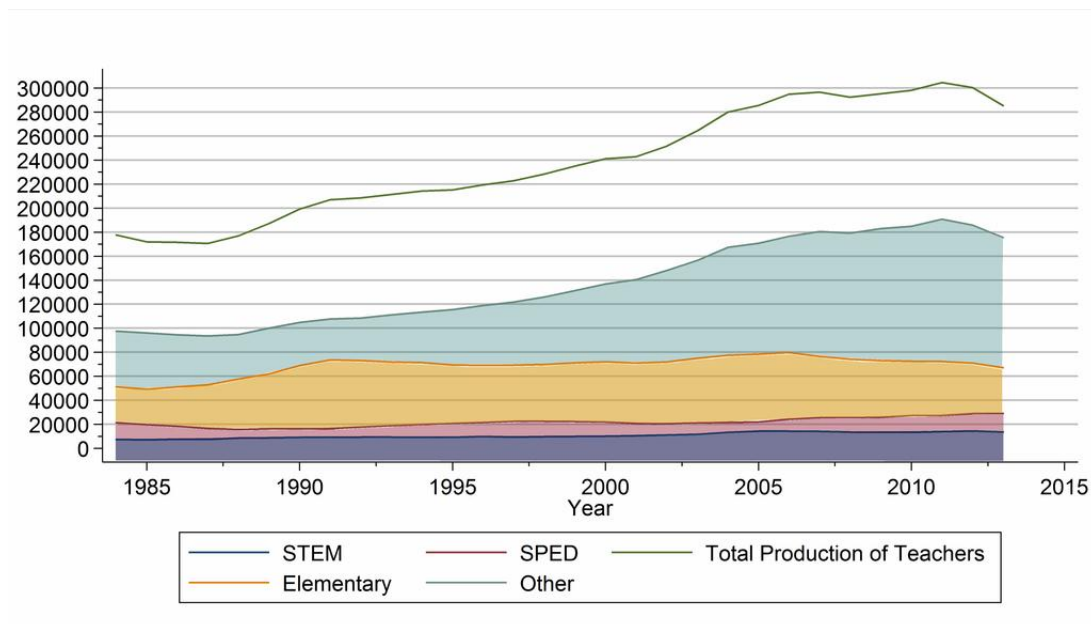
Erica Blom and her colleagues [describe](#) one source of the cyclicity in terms of college students' choice of major. They find that students who attend college during periods of higher unemployment tend to



select majors that result in higher wages and better opportunities to get jobs in their field of study. In particular, they find that poor economic conditions drive college students away from degrees in fields leading to positions in K-12 classrooms.

While the Great Recession is almost surely contributing to the most recent slowdown in the production of teachers, Figure 1 illustrates that positive growth in the number of teachers over the long-term is historically insulated from brief economic shocks.

Figure 1: Aggregated Number of Degrees in Education (1984-2013)¹



Additionally, while the number of teachers produced by teacher preparation programs has grown steadily since 1985², only about half of these teachers are hired. Specifically, the School and Staffing

¹ **Note:** The vertical axis above shows the aggregated number of degrees issued in education fields between 1984 and 2013. This number may not represent the true number of newly credentialed teachers because alternatively-certified teachers are not included, individuals who graduate but do not complete the requirements (e.g. Licensure tests) to receive a teaching credential are included, and teachers who receive a Bachelor's and higher degree in education may be double-counted (e.g. In the case of teachers in the field who start with a B.A. but get an M.A. while continuing to teach). Data on initial teaching credentials in recent years (2010-2013) from Title II suggest that the numbers in Figure 1 are about 15% higher than the true number of newly credentialed teachers.

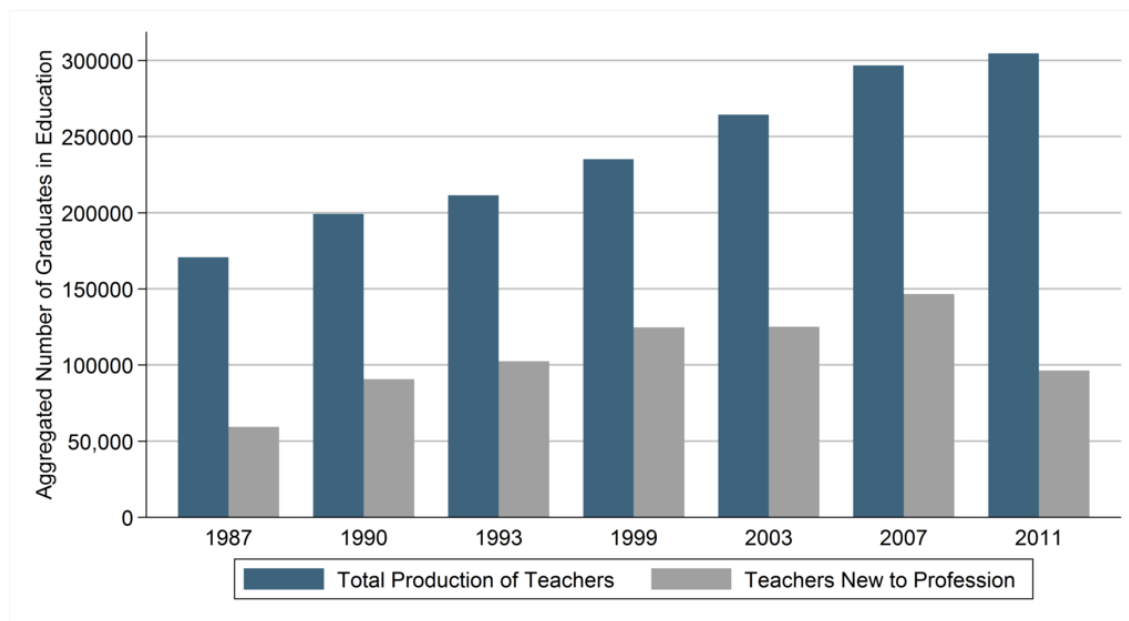
Source: IPEDS Completion Data, [National Center for Education Statistics](#)

² Part of the increase in education degrees can be attributed to the rise in the number of teachers with Master's degrees. Over the past 30 years, the number of teachers who have received teaching certificates through a Master's program has increased dramatically. For instance, in 1985, Master's degrees accounted for 44% of new baccalaureate or post-baccalaureate education certificates, but by 2013, they accounted for 59%.



Survey displayed in Figure 2 shows that between 175,000 and 300,000 teachers were produced during survey years, but only 60,000 to 140,000 of these new teachers were hired. While hiring is likely to increase in the coming years due to an aging teacher workforce, hiring of new teachers will continue to trail the production of new teachers.

Figure 2: Production and Hiring of Teachers New to the Profession (Selected Years)



Source: IPEDS Completion Data (Production) and the Schools and Staffing Survey³

What Do We Know About the Influences of Teacher Supply and Demand?

There are several factors that influence both the supply of labor teachers provide and the demand for labor by school districts as employers. These include salaries, retirement and health benefits, and licensure policies.

Figure 1 (above) shows that while the production of teachers in most areas rose steadily between 1984 and 2013 (in this case, “Other” includes general education, P.E., reading instruction, secondary education teachers), production of teachers in STEM and Special Education has remained flat. The corresponding demand shows (Figure 3) that STEM and Special Education positions tend to have the highest share of vacancies over time.

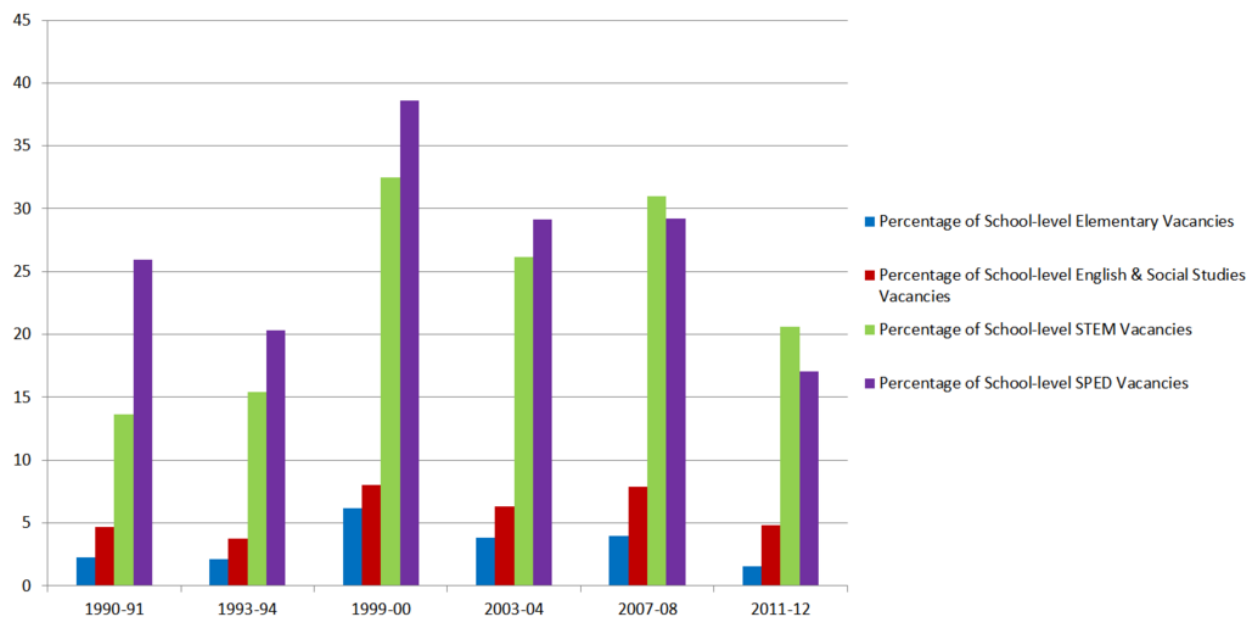
³ Publicly accessible data for the Schools and Staffing Survey from 1987-2007 is available at: http://nces.ed.gov/surveys/sass/tables/sass0708_034_t1n.asp



Schools, like any employer, offer positions in different subject areas and with different working conditions to applicants. To compensate for less desirable working conditions or to attract more desired applicants, other industries offer higher pay. But schools are limited in their ability to compete with higher quality jobs or for applicants with degrees in high demand (like STEM subjects and Special Education) because of standardized salary schedules. Ameliorating shortages in particular high demand fields or in hard-to-staff schools may therefore require more targeted policy prescriptions than across-the-board pay increases. In the past, states have used targeted bonuses, loan forgiveness, and tuition reimbursement to address teacher shortages.

While salary differences can play a role in enabling an equitable distribution of teachers, they are not a silver bullet. [CALDER Working Paper 44](#) estimates that salary increases in North Carolina were found to be effective at increasing retention only for teachers in their first teaching spell and for teachers with weaker preservice qualifications. More experienced teachers and teachers with stronger qualifications were more sensitive to the racial and socioeconomic mix of a school's students and less responsive to salary incentives. A [review](#) of a more targeted bonus to certified math, science and special education teachers working in disadvantaged North Carolina high schools showed these bonuses were more effective for experienced teachers. A similar bonus awarded to National Board Certified Teachers (NBCTs) in Washington state also [showed](#) evidence that the bonus improved retention of NBCTs. And CALDER Working Paper 141 found that loan forgiveness programs for teachers with high-needs endorsements reduced the attrition of teachers in shortage areas in Florida. Together, this evidence suggests that targeted financial incentives may be a cost-effective way to attract teachers in subject areas with consistently high vacancy rates or to schools that are difficult to staff.

Figure 3: Percentage of Schools with Vacancies Reporting Difficulty Filling Vacancies within Specific Disciplines



Source: Goldhaber et al., 2015

Another factor worth noting is the impact of teacher retirement and licensure structures on the ability of teachers to switch positions. Pension programs have been traditionally viewed as a policy tool that increases the career length of a teacher while licensure is viewed as an important quality control mechanism. But research suggests that both may inhibit teacher mobility without delivering the assumed benefits.

[CALDER Working Paper 123](#) shows that a 1999 change to St. Louis's pension formula, which increased the value of pension wealth for teachers by 60 percent effective at the implementation date, did not meaningfully change the retirement behavior of St. Louis teachers.

Further work on pensions shows that the inability to transfer existing pension wealth across pension systems undermines the strategy of schools looking to fill vacancies by recruiting in other states. CALDER Working Papers [67](#) and [39](#) show that teachers who split their careers between two pension systems often lose more than 50 percent of the value of their pension that they would have maintained had they taught for their entire career in one state.

Similarly, teacher licensure rules inhibit mobility through their complexity. For instance, [CALDER Working Paper 143](#) describes Oregon and Washington's licensure reciprocity agreement that recognizes



certain licenses as transferable between the two states. However, most teachers in either state do not have this type of license and teachers licensed in any other state cannot take advantage of reciprocity. In Oregon and Washington, this results in almost three times as many teachers making within-state moves of 75 or more miles than teachers making much closer moves across the state border.

In sum, these factors contribute to teacher shortages by making it more difficult for schools to compete for teachers when filling positions in low-income schools or high-demand fields, while efforts to recruit existing teachers in other states are hampered by pension and licensure regulations, which create rigidities in teacher labor markets.

Conclusions and Open Questions:

While the research presented here provides much needed context to the issue of teacher shortages, there are still important issues to consider.

First, research questions some of the popularly presumed causes of teacher shortages. [Calder Working Paper 33](#) demonstrates that perceptions of working conditions are less important than typically thought. While teachers who cite poor working conditions are more likely to say they will leave their jobs, the link disappears when actual departure rates after one year are considered. Research can build on this finding by exploring actual departure rates after more than one year.

Second, reporting on teacher shortages often ignores potential positive benefits of some types of teacher attrition. Research from [North Carolina](#), [New York](#), [Washington](#), and [Texas](#) shows that teachers with higher effectiveness ratings are more likely to stay in their current classrooms than are teachers with lower effectiveness ratings. If the teachers who are leaving the classroom are less effective, then the average effectiveness among remaining teachers should improve. This is true especially given some evidence that the academic qualifications of incoming teachers are [improving](#).

Overall, consideration of the pay, pension and licensure policies that are shown to impact selection into teaching, and in-career teacher attrition and mobility, in continued research will provide improved evidence upon which policymakers can design effective policies to ensure that children in all classrooms have access to a high-quality education.

All of CALDER's Working Papers and further information about teacher labor markets can be found at CALDER's website, www.caldercenter.org



Suggested Citation:

Cowan, J., Goldhaber, D., Hayes, K. & Theobald, R. (2015). Missing Elements in the Discussion of Teacher Shortages. Washington, DC: American Institutes for Research. (Available at: <http://www.caldercenter.org/missing-elements-discussion-teacher-shortages>)

Citations:

Blom, E., Cadena, B. C., & Keys, B. J. (2015). Investment over the Business Cycle: Insights from College Major Choice (No. 9167). IZA Discussion Papers.

Boyd, D., Grossman, P., Lankford, H., Loeb, S., & Wyckoff, J. (2009). Who Leaves? Teacher Attrition and Student Achievement. Working Paper 23. National Center for Analysis of Longitudinal Data in Education Research.

Clotfelter, C., Glennie, E., Ladd, H., & Vigdor, J. (2008). Would higher salaries keep teachers in high-poverty schools? Evidence from a policy intervention in North Carolina. *Journal of Public Economics*, 92(5), 1352-1370.

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2010). Teacher Mobility, School Segregation, and Pay-Based Policies to Level the Playing Field. Working Paper 44. National Center for Analysis of Longitudinal Data in Education Research. (Also published in: *Education Finance and Policy*, 6(3), 399-438.)

Costrell, R. & Podgursky, M. (2009). Distribution of Benefits in Teacher Retirement Systems and Their Implications for Mobility. Working Paper 39. National Center for Analysis of Longitudinal Data in Education Research. (Also published in: *Education Finance and Policy*, 5(4), 519-557.)

Cowan, J., & Goldhaber, D. (2015). Do Bonuses Affect Teacher Staffing and Student Achievement in High-Poverty Schools? Evidence from an Incentive for National Board Certified Teachers in Washington State.

Eger, A. (2015, August 22). State Superintendent Joy Hofmeister addresses teacher shortage, ACT pilot program in Tulsa. *Tulsa World*. Retrieved from <http://www.tulsaworld.com/news/education/state-superintendent-joy-hofmei...>

Goldhaber, D. Grout, C., Holden, K. & Brown, N. (2015). Crossing the Border? Exploring the Cross-State Mobility of the Teacher Workforce. Working Paper 144. National Center for Analysis of Longitudinal Data in Education Research.



Goldhaber, D., Gross, B., & Player, D. (2007). Are Public Schools Really Losing Their Best? Assessing the Career Transitions of Teachers and Their Implications for the Quality of the Teacher Workforce. Working Paper 12. National Center for Analysis of Longitudinal Data in Education Research.

Hanushek, E. A., Kain, J. F., O'Brien, D. M., & Rivkin, S. G. (2005). The market for teacher quality (No. w11154). National Bureau of Economic Research.

Krieg, J. M. (2006). Teacher quality and attrition. *Economics of Education review*, 25(1), 13-27.

Koedel, C., Grissom, J. A., Ni, S., & Podgursky, M. (2012). Pension-Induced Rigidities in the Labor Market for School Leaders. Working Paper 67. National Center for Analysis of Longitudinal Data in Education Research.

Koedel, C., & Xiang, P. B. Pension Enhancements and the Retention of Public Employees: Evidence from Teaching.

Ladd, H. F. (2009). Teachers' Perceptions of Their Working Conditions: How Predictive of Policy-Relevant Outcomes? Working Paper 33. National Center for Analysis of Longitudinal Data in Education Research. (Also published in: *Educational Evaluation and Policy Analysis*, 33(2), 235-261.)

Lankford, H., Loeb, S., McEachin, A., Miller, L., & Wyckoff, J. (2014). Who Enters Teaching? Encouraging Evidence that the Status of Teaching is Improving. Working Paper 124. National Center for Analysis of Longitudinal Data in Education Research. (Also published in: *Educational Researcher*, 43(9), 444-453.)

McKenna, L. (2015, September 10). America's Teaching Force, by the Numbers. *The Atlantic*.
<http://www.theatlantic.com/education/archive/2015/09/americas-teaching-f...>

Noguchi, S. (2015, August 6). Bay Area schools in a hiring frenzy just days before students return to class. *San Jose Mercury News*. Retrieved from http://www.mercurynews.com/bay-area-news/ci_28610885/bay-area-schools-hi...

Rich, M. (2015, August 9). Teacher Shortages Spur a Nationwide Hiring Scramble (Credentials Optional). *New York Times*. Retrieved from <http://www.nytimes.com/2015/08/10/us/teacher-shortages-spur-a-nationwide...>

Statistics, N. C. f. E. (2015a). IPEDS. Retrieved October 20, 2015, from <https://nces.ed.gov/ipeds/datacenter/Default.aspx>

Statistics, N. C. f. E. (2015b). School and Staffing Survey (SASS). Retrieved October 20, 2015, from http://nces.ed.gov/surveys/sass/tables/sass0708_034_t1n.asp



NATIONAL
CENTER *for* ANALYSIS of LONGITUDINAL DATA in EDUCATION RESEARCH

TRACKING EVERY STUDENT'S LEARNING EVERY YEAR

A program of research by the American Institutes for Research with Duke University, Northwestern University, Stanford University, University of Missouri-Columbia, University of Texas at Dallas, and University of Washington



Westervelt, E. (2015). Where Have All The Teachers Gone? National Public Radio. Retrieved from <http://www.npr.org/sections/ed/2015/03/03/389282733/where-have-all-the-t...>