Background Papers

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"STEM Performance and Supply: Assessing the Evidence for Education Policy" (February) Hal Salzman and Beryl Lieff Benderly *Journal of Science Education and Technology* https://doi.org/doi:10.7282/t3-7551-p083

Salzman, Hal & Lowell, B. Lindsay (2008). Making the Grade. *Nature*, 453(1 May 2008), 28-30.
http://dx.doi.org/doi:10.7282/T3Q241WW
Educational performance of U.S. and International students and workforce supply

Salzman, Hal (2013). **What Shortages? The Real Evidence About the STEM Workforce.** *Issues in Science and Technology*, (Summer 2013), 58-67. https://doi.org/doi:10.7282/T3JS9S2T

Background on history of current shortage claims
Salzman, Hal (2013). What Shortages? The Real Evidence About the STEM Workforce. *Issues in Science and Technology*, (Summer 2013), 58-67. http://dx.doi.org/doi:10.7282/T3JS9S2T
http://www.issues.org/29.4/hal.html
Why is the widely accepted view of shortage at odds with study after study that has found the U.S. science and engineering supply to be strong and improving? And why are policymakers and industry leaders offering proposals that go against this solid body of evidence? This article examines the recent history of the "shortage" claims and implications for policy

short overview:
http://www.usnews.com/opinion/articles/2014/09/15/stem-graduates-cant-find-jobs

All credible research finds the same evidence about the STEM workforce: ample supply, stagnant wages and, by industry accounts, thousands of applicants for any advertised job. The real concern should be about the dim employment prospects for our best STEM graduates: The National Institutes of Health, for example, has developed a program to help new biomedical Ph.D.s find alternative careers in the face of "unattractive" job prospects in the field. Opportunities for engineers vary by the field and economic cycle – as oil exploration has increased, so has demand (and salaries) for petroleum engineers, resulting in a near tripling of petroleum engineering graduates. In contrast, average wages in the IT industry are the same as those that prevailed when Bill Clinton was president despite industry cries of a "shortage." Overall, U.S. colleges produce twice the number of STEM graduates annually as find jobs in those fields.

Douglas, Daniel & Salzman, Hal (2019). **Math counts: major and gender differences in college mathematics coursework.** *The Journal Of Higher Education* https://doi.org/doi:10.7282/t3-g8h5-ze50

Detailed statistics and background

Salzman, Hal. Statement of Hal Salzman: hearing on "Immigration Reforms Needed to Protect Skilled American Workers" submitted to the Senate Committee on the Judiciary, U.S. Senate, March 17, 2015. http://dx.doi.org/doi:10.7282/T3ZK5JC3

Testimony submitted to the Senate Committee on the Judiciary, U.S. Senate, 25 February 2016:
The Impact of High-Skill Guestworker Programs and the STEM Workforce

http://dx.doi.org/doi:10.7282/T3474CXX

Currently, U.S. colleges graduate far more scientists and engineers than find employment in those fields every year—about 200,000 more—while the IT industry fills as much as two-thirds of its entry-level and early-career positions with guestworkers. At the same time, IT wages have stagnated for over a decade. Current H-1B and L visa policies and the proposed changes that increase the supply of STEM guestworkers are likely to accelerate the already deteriorating career prospects for STEM graduates and workers. New provisions in the proposed Senate bill will also have detrimental impact on U.S. colleges and universities.

The Bogus High-Tech Worker Shortage

http://www.pbs.org/newshour/making-sense/the-bogus-high-tech-worker-sho/
.... this is a debate about America's policies for creating good jobs, strong technology and an innovation-based economy. We welcome immigrants and support an immigration policy that draws the best and the brightest and provides opportunity to newcomers. But policy should not be about targeting government giveaways to a few industries by supplying ever more guest workers when there is an ample domestic supply of qualified graduates and workers.

We're Already Generating More Qualified Students Than Jobs
Our analysis of the data finds that high-skill guest worker programs supply the preponderance of all new hires for the IT industry. The inflow of guest workers is equal to half of all IT hires each year and fully two-thirds of annual hires of workers younger than 30. Can it be a coincidence that wages in IT jobs have been stagnant for over a decade?

Salzman, Hal & Kuehn, Daniel & Lowell, B. Lindsay (2013). Guestworkers in the High-Skill U.S. Labor Market: An Analysis of Supply, Employment, and Wage Trends. *Report*, April 24, 2013
http://dx.doi.org/doi:10.7282/T379469D
http://www.epi.org/publication/current-proposed-high-skilled-guestworker/

In 2011, the number of college-educated guestworkers under the age of 30 in IT was equal to two-thirds of all the 166,000 new college-educated IT job holders under the age of 30. At a time when Congress is proposing to dramatically increase the number of skilled guestworkers available to IT and other industries, it is important to consider the adverse impact of increasing the guestworker flow on U.S. college graduates just entering the workforce and on those in school making plans for their future.

"Into the Eye of the Storm: Assessing the Evidence on Science and Engineering Education, Quality, and Workforce Demand." Lowell, B. Lindsay and Hal Salzman (2007) *The Urban Institute*. Washington, DC.

Salzman, Hal & Lowell, B. Lindsay (2008). Making the Grade. *Nature*, 453(1 May 2008), 28-30.
http://dx.doi.org/doi:10.7282/T3Q241WW

Educational performance of U.S. and International students and workforce supply

Salzman, Hal (2014). STEM Grads Are at a Loss. *U.S. News & World Report*, Sept 15(2014)
http://dx.doi.org/doi:10.7282/T33B622G
http://www.usnews.com/opinion/articles/2014/09/15/stem-graduates-cant-find-jobs

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