

<<<<< **JOB DESTRUCTION NEWSLETTER No. 1777 -- 10/29/2007** >>>>>

Vivek Wadhwa, the enigmatic part-time editorialist and CEO, wrote a thought provoking article for Businessweek that is spreading around the internet like a wildfire. Without a doubt, Wadhwa is turning into an internet celeb over this one.

One thing really caught my eye -- he wrote that during the time period from 1985 to 2000, about 435,000 U.S. citizens and permanent residents a year graduated with Bachelor's, Master's, and Doctoral degrees in science and engineering. Over the same period, there were about 150,000 jobs added annually to the science and engineering workforce.

Let's consider just what those numbers mean. Every year, for the 15 year time period considered (1985-2000) there was a job deficit of 285,000 jobs per year. That translates to a total job creation deficit of 4,275,000. Pay attention to the time span -- those years were considered to be the boom times for high-tech careers. Numbers may not be available for the last 7 years but you can bet things are far worse now.

So here is the jobs scorecard for 15 years:

2,250,000	S&E jobs were created
-6,525,000	Americans graduated with S&E degrees
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-4,275,000	jobs deficit

Put another way, we graduated more than 4 million science and engineering grads than the job market needed. Corporations also fired a lot of them, which is not counted in those numbers. What kind of shortage is that?

During this time what was the U.S. government doing to help the problem? Well, at the same time millions of S&E grads couldn't find jobs in their chosen profession, the government was solving an alleged "shortage" by importing vast numbers of H-1B and L-1 visa holders, and if that wasn't enough they were giving even more jobs away permanently by handing out millions of green cards. Also, let's don't forget they were also giving incentives for companies to move jobs overseas. I'm not sure how to calculate the total deficit that visas added to the total above because many H-1Bs return home, and others convert their visas to green cards. Still others just let their visas go out of status and stay in the U.S. as "documented" illegal immigrants.

All of this math gave me a headache, so I decided to ask Vivek Wadhwa where

the millions of grads go after they find that they can't find a job in their chosen career. He answered that about two thirds of the engineering graduates take jobs in other professions, complete higher education, or leave the field because they don't do well. In other words, most of the S&E grads have to get other types of jobs because of a glut of scientists and engineers.

Put another way, the success rate of engineering and science graduates at finding jobs in their chosen major is 33%, which means conversely means that 66% of them are unable to find a career in science and engineering after they graduate. It appears that many of them go onto graduate school in the desperate hope that a more advanced degree will help them in the marketplace. What Wadhwa was saying got me curious enough to go to a few university websites to see if they were telling prospective students about the risks involved in choosing S&E as a career choice.

If universities were required to have "truth in advertising" they would put these statistics up there so that students could make intelligent decisions about what career to pursue, but instead the students are lied to from day one.

I decided to go to a few university websites to see if they are starting to be more truthful in the advertising. The results didn't surprise me because nothing has changed. Universities are in the business of recruiting students, not in giving them good career advice.

Take this example from the Penn State engineering website. Notice how they avoid any mention of specifics, like for instance what percentage of their graduates actually get engineering work at companies like AT&T. Instead they prefer vague terms like "others". Considering this is supposed to be a school of engineering they sure are squishy on the math!

<http://www.esm.psu.edu/faq/>

What do engineering Science students do after graduation?

A large number of our graduates continue on to the top graduate school in the US (for example: Carnegie Mellon, Cornell, Michigan, Penn State, Stanford, UC Berkeley).

Others accept positions with companies such as AT&T, Bechtel Bettis, Dupont, ExxonMobil, Ford, GE, IBM, Lockheed Martin, Lucent Technologies or government agencies such as the Naval Research Lab and the US Patent Office. Still others enter medical school, law school, obtain MBAs, and/or start their own companies.

Drexel University is even more coy. Prospective students who want to learn about engineering careers are provided with nothing more than a links page to engineering associations who are in the business of convincing gullible students to go into engineering (the usual suspects are linked such as IEEE, AEC, ASME, etc.). Nothing that I saw on the Drexel web pages honestly discusses the miserable odds these students will face when they graduate.

<http://www.library.drexel.edu/resources/guides/engineeringjobs.html>

I'm not going to belabor this point much, but I did think it would be enlightening to go to the big daddy of them all -- the National Academy of Sciences. Most of the universities just copy and paste their writings so I went to their website and found out all about careers for PhDs. The first paragraph is such a bunch of politically correct gobbledygook I just had to share it with you!

<http://www.nap.edu/readingroom/books/careers/chap2.html#how>

In engineering, careers are being transformed by several intersecting trends. International companies now draw employees from many nations, seeking out valued experts from a global pool of labor to work project by project. Companies value multilingual workers with a breadth of competencies -- managerial as well as technical -- and the ability to access and apply new scientific and technologic knowledge.

So nowadays engineers have to be multilingual and know soft skills like how to do performance reviews. I'll bet most universities aren't requiring their engineers to take business, management, or foreign language classes, but they should since that's what many of them will be using their engineering degrees for. Better yet, advisors ought to just tell them to save themselves some trouble by getting an MBA with English as a second language.

Nowhere on the NAS web page was I able to find an honest discussion about the percentages of their students who actually go into their fields of study. They do however write in the most glowing of terms that PhDs in chemistry who get jobs in things like sales, management, and perhaps being bank tellers.

Similarly, PhD chemists have success in moving beyond the laboratory bench to a wide range of careers. Within companies, they might move into marketing, production, manufacturing, sales, or management. Or they can move into such related fields as environmental

chemistry, public policy, education, journalism, scientific translation, law, banking, medicine, patent law, public service, and regulation.

I'm not accusing ALL universities of deliberately lying to innocent and gullible young American kids. I'm sure there are a few out there that tell the truth -- it's just that I haven't found one. If you know of a university that tells the truth, please send me a link to the web page with an excerpt.

You may wonder why I diverted so much on this issue of universities, but it all ties back to Vivek Wadhwa. In our emails he made the comment that S&E degrees are becoming more like liberal arts degrees. He follows with a positive spin that S&E diplomas lead to many other fields that Americans thrive in. He didn't elaborate on specific fields but I assume he meant something better than the usual alternative like flipping burgers.

Sadly, Vivek is probably correct that S&E degrees are not much better than liberal arts degrees. My BSEE is probably not worth its weight in toilet paper! Of course that leads to the next question: wouldn't it be smarter just to get a liberal arts degree? Why hassle with the tough coursework to get a science or engineering degree when employers consider both diplomas equally valuable? I asked Vivek that exact question but so far he has only answered me in riddles. He also gave me a list of some companies the graduates at his university went to work for, which is kind of like saying everyone should play Powerball because there is a certifiable list of winners.

Perhaps universities should explain on their websites that 33% of their S&E grads will get decent jobs, while the others will compete with the liberal arts grads for whatever crumbs are left. They might as well be honest because nowadays the kids going to college know the truth, and that's why they aren't enrolling in S&E. Everyone but the media and our politicians understand that students are making intelligent career decisions by avoiding S&E degrees.

Vivek Wadhwa is very good at diagnosing problems and articulating them on paper. Having said that, there is not much in his article that hasn't been written many times before (see footnote below). The only difference is that Wadhwa is a CEO that happens to be a naturalized citizen from India, and he happens to write for Business Week. My guess is that the mainstream media will ignore his article because it has a little too much of the truth, and he makes enough credible points to make most corporacrats squirm

Wadhwa is somewhat of a heretic, and I'm sure he will receive wide scale

condemnation in the business and Indian communities for writing the article. That doesn't mean we should embrace his positions on employment based visas, but we certainly should use what he says to bolster what we have been trying to say for years.

At first blink many of you will buy into Wadhwa's solutions to the problems because he warns of the dangers of outsourcing, and he even goes as far as saying that H-1B should be abolished. Sounds good right? Well it would be if his alternative made sense, but instead he is strictly party line when it comes to how to solve the job mess. His solution to the problem is no different than IEEE, or many others -- he wants to hand out unlimited numbers of green cards for everyone who wants to work in the U.S.

Folks, trading H-1B for green cards is like making a deal with the devil!

You won't have to search hard to find more of Wadhwa's writings where he voices support for expanding the green card program. Just to see if he changed his mind about green cards I emailed him and was disappointed when he reaffirmed his boosterism for handing out green cards like Halloween treats.

I'm sure all of you that have been on my mailing list get tired of me giving out these links, but keep in mind that I get new people and they need this information. I suspect most of you haven't read either of these either, and unless you do you will be suckered in by Vivek Wadhwa's open-border slant.

To understand more about H-1B vs. green cards, go to the following links:

<http://www.jobdestruction.info/ShameH1B/H1BvsGreenCard.htm>

H-1B vs. Green Cards Which is Better?

Debate between Rob Sanchez, Dr. Norman Matloff, and Paul Donnelly in the year 2002

<http://heather.cs.ucdavis.edu/PrevWage.pdf>

Fixing Our Badly Broken H-1B Visa and Employer-Sponsored Green Card Programs

by Norman Matloff

Vivek thinks that the good of the nation is served by doing what's best for business. That's understandable considering he is a CEO. Unfortunately sometimes the interests of business and labor are in conflict with each other. We cannot allow wild increases in the number of green card holders without harming the workforce. Call me insensitive to the needs of business

if you will, but we shouldn't let big business dictate public policy or allow them to run roughshod over this country. Most big businesses have no national loyalty or identity so they could care less what's good for the USA.

I have another major problem with Vivek's article: Vivek makes the supposition that foreigners who come to the U.S. file more patents than U.S. citizens. Let's just give him a pass on that one because it's so easy to debunk it's just not much of a challenge for me.

What really gets my goat is when he makes the false premise where a foreigner in the U.S., who is some kind of genius, is filing patents as fast as popcorn pops. Naturally the U.S. cannot compete in the global economy without this foreign born genius who was nice enough to bless our soil with his presence. In Vivek's scenario this best-and-brightest immigrant who is essential to the future of our nation is forced to go back to his home country because he is going to be inconvenienced while having to wait a few years to get his green card. Keep in mind he already has a visa and that he is already working in the U.S. Vivek warns that unless we start handing out green cards these foreign born geniuses and entrepreneurs will move to someplace more lucrative, like Communist China, which of course will use his scientific prowess to do evil deeds.

OK, I know it sounds sort of like a Halloween story, but I'm not the one that made it up, Vivek did!

Let's just say for the sake of argument Vivek's scenario did occur. Imagine if you will somebody that invented a new video game that our kids can't live without, or perhaps a medical device that will save lives. Let's also imagine that the meanies at the Department of Homeland Security acted like imbecilic bureaucrats and deported him because his student visa expired, or perhaps his H-1B went out of status. From a practical standpoint, why should we care if that genius invents the widget in India or China vs. the USA? It's still going to be made overseas by a company that isn't going to share that new wealth in the USA, so who cares? Either way the profits from the device is going to go into a CEO's Bermuda bank account.

Does anybody really believe that our kids won't get that game DVD because a programmer designed a video game in Bangalore instead of Palo Alto? Either way, the DVD won't be made in the USA.

Vivek's silly scenario only makes sense to people who haven't wised up to the reality of trans-national corporations who have no national identity or loyalty to the American consumers and workers who made them rich. Vivek is all wet, but his imaginary scenario is a popular one in the press. Vivek probably didn't invent this so-called doomsday scenario either but the

problem is that he is listened to more than most of the skills.

Now for the reality check: There are plenty of methods for the geniuses of the world to stay here, including "O" visas or EB-1s. Despite what Vivek would have you believe they are not hard to get for recognized experts. They are only hard to get for foreigners who come here to supply our greedy corporations with cheap labor, but even that's not a problem -- we have H-1B for that.

Lost in any of this is a discussion of the ethics involved in stealing other nations' geniuses, so I will only mention it in passing. An implicit assumption is made in our media made that it's OK to steal other nation's scientists and engineers as long as it increases the profits of our corporations. Does anybody see something wrong with this but me?

Well, excuse the rather long commentary, now read it yourself. I know I'm in trouble when my commentary is larger than the original article!

<<<<< FOOTNOTE >>>>>

In 1989, Citro and Kaltron did a study for the NAS titled "Surveying the Nation's Scientists and Engineers" in which they described "attachment rates", which is the propensity of S&E grads to work in occupations in fields related to their degree. They found the attachment rate was only 33% for advanced S&E grads and a dismal 25% for Bachelor deegreed. Remember the NAS? They are the ones that don't think there is a problem that PhDs in chemistry work as bank tellers. They have also been one of the chief prognosticators of the shortage theories for about the last 30 or 40 years. Nothing has changed in that period of time, not even the statistics!

Speaking of attachment rates, Vivek Wadhwa got a BA degree in CS, and then made his fortune as a CEO. Does that tell you something?

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[http://www.businessweek.com/smallbiz/content/oct2007/sb20071025\\_827398.htm](http://www.businessweek.com/smallbiz/content/oct2007/sb20071025_827398.htm)

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The Science Education Myth

Forget the conventional wisdom. U.S. schools are turning out more capable science and engineering grads than the job market can support  
by Vivek Wadhwa

Political leaders, tech executives, and academics often claim that the U.S. is falling behind in math and science education. They cite poor test results, declining international rankings, and decreasing enrollment in the hard sciences. They urge us to improve our education system and to graduate more engineers and scientists to keep pace with countries such as India and China.

Yet a new report by the Urban Institute, a nonpartisan think tank, tells a different story. The report disproves many confident pronouncements about the alleged weaknesses and failures of the U.S. education system. This data will certainly be examined by both sides in the debate over highly skilled workers and immigration (BusinessWeek.com, 10/10/07). The argument by Microsoft (MSFT), Google (GOOG), Intel (INTC), and others is that there are not enough tech workers in the U.S.

The authors of the report, the Urban Institute's Hal Salzman and Georgetown University professor Lindsay Lowell, show that math, science, and reading test scores at the primary and secondary level have increased over the past two decades, and U.S. students are now close to the top of international rankings. Perhaps just as surprising, the report finds that our education system actually produces more science and engineering graduates than the market demands.

#### Junior Scientists on the Rise

These findings go against what has been the dominant position about our education system and our science and engineering workforce. Consider reports on national competitiveness that policymakers often turn to, such reports as the 2005 "Rising Above the Gathering Storm" by the National Academy of Sciences. This report says the U.S. is in dire straits because of poor math and science preparation. The report points to declining test scores, fewer students taking math and science courses, and low-quality curriculums and teacher preparation in K-12 education compared to other countries.

The call has been taken up by some of the most prominent people in business and politics. Bill Gates, chairman of Microsoft, said at an education summit in 2005, "In the international competition to have the biggest and best supply of knowledge workers, America is falling behind." President George W. Bush addressed the issue in his 2006 State of the Union address. "We need to encourage children to take more math and science, and to make sure those courses are rigorous enough to compete with other nations," he said.

Salzman and Lowell found the reverse was true. Their report shows U.S. student performance has steadily improved over time in math, science, and

reading. It also found enrollment in math and science courses is actually up. For example, in 1982 high school graduates earned 2.6 math credits and 2.2 science credits on average. By 1998, the average number of credits increased to 3.5 math and 3.2 science credits. The percent of students taking chemistry increased from 45% in 1990 to 55% in 1996 and 60% in 2004. Scores in national tests such as the National Assessment of Educational Progress, the SAT, and the ACT have also shown increases in math scores over the past two decades.

And the new report again went against the grain when it compared the U.S. to other countries. It found that over the past decade the U.S. has ranked a consistent second place in science. It also was far ahead of other nations in reading and literacy and other academic areas. In fact, the report found that the U.S. is one of only a few nations that has consistently shown improvement over time.

Why the sharp discrepancy? Salzman says that reports citing low U.S. international rankings often misinterpret the data. Review of the international rankings, which he says are all based on one of two tests, the Trends in International Mathematics & Science Study (TIMSS) or the Programme for International Student Assessment (PISA), show the U.S. is in a second-ranked group, not trailing the leading economies of the world as is commonly reported. In fact, the few countries that place higher than the U.S. are generally small nations, and few of these rank consistently high across all grades, subjects, and years tested. Moreover, he says, serious methodological flaws, such as different test populations, and other limitations preclude drawing any meaningful comparison of school systems between countries.

#### Enough Jobs for the Grads?

As far as our workforce is concerned, the new report showed that from 1985 to 2000 about 435,000 U.S. citizens and permanent residents a year graduated with bachelor's, master's, and doctoral degrees in science and engineering. Over the same period, there were about 150,000 jobs added annually to the science and engineering workforce. These numbers don't include those retiring or leaving a profession but do indicate the size of the available talent pool. It seems that nearly two-thirds of bachelor's graduates and about a third of master's graduates take jobs in fields other than science and engineering.

Michael Teitelbaum, vice-president of the Alfred P. Sloan Foundation, which, among other things, works to improve science education, says this research highlights the troubling weaknesses in many conventional policy prescriptions. Proposals to increase the supply of scientists and engineers rapidly, without any objective evidence of comparably rapid growth in

attractive career opportunities for such professionals, might actually be doing harm.

### Shortages in Specific Skills

In previous columns, I have written about research my team at Duke University completed that shattered common myths (BusinessWeek.com, 7/10/06) about India and China graduating 12 times as many engineers as the U.S. We found that the U.S. graduated comparable numbers and was far ahead in quality. Our research also showed there were no engineer shortages (BusinessWeek.com, 11/7/06) in the U.S., and companies weren't going offshore because of any deficiencies in U.S. workers.

So, there isn't a lack of interest in science and engineering in the U.S., or a deficiency in the supply of engineers. However, there may sometimes be short-term shortages of engineers with specific technical skills in certain industry segments or in various parts of the country. The National Science Foundation data show that of the students who graduated from 1993 to 2001, 20% of the bachelor's holders went on to complete master's degrees in fields other than science and engineering and an additional 45% were working in other fields. Of those who completed master's degrees, 7% continued their education and 31% were working in fields other than science and engineering.

There isn't a problem with the capability of U.S. children. Even if there were a deficiency in math and science education, there are so many graduates today that there would be enough who are above average and fully qualified for the relatively small number of science and engineering jobs. Science and engineering graduates just don't see enough opportunity in these professions to continue further study or to take employment.

### Creating Wider-Ranging Demand

With U.S. competitiveness at stake, we need to get our priorities straight. Education is really important, and a well-educated workforce is what will help the U.S. keep its global edge. But emphasizing math and science education over humanities and social sciences may not be the best prescription for the U.S. We need our children to receive a balanced and broad education.

Perhaps we should focus on creating demand for the many scientists and engineers we graduate. There are many problems, from global warming to the development of alternative fuels to cures for infectious diseases, that need to be solved. Rather than blaming our schools, let's create exciting national programs that motivate our children to help solve these problems.

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