



TM0705-1: Brain-Draining Our Future

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Abstract - Very few of us think about the country's brain drain. Our attitude seems to be, 'So what? Instead of technology and its products, we'll just sell the world our high-powered legal and business services.' We expect the income from this shift will not only cure the trade deficit but also make up losses from our historical role as world leaders in inventing and developing new technologies - the technologies that have always fueled our industries and created jobs for the masses of fellow Americans less educated, creative, or entrepreneurial.' We forget that such innovations over the last two centuries have produced a broadly shared quality of life that no country in history has matched. Current trends in critical skill demographics say that all of this is rapidly coming to an end. Is then our destiny to become a second-rate country returning to an agrarian economy comprised of mega-farms owned by multi-national corporations?

In this short piece I argue that we have a brain drain due to 1) fewer US kids going into high-tech careers, 2) fewer foreign-born technologists coming here or staying here, 3) the resulting brain drain will have near-term cataclysmic results on our quality of life, and 4) the hope for a better future starts with action at the grass roots level instead of waiting for more government programs of the kind that got us there in the first place and keep us there now.

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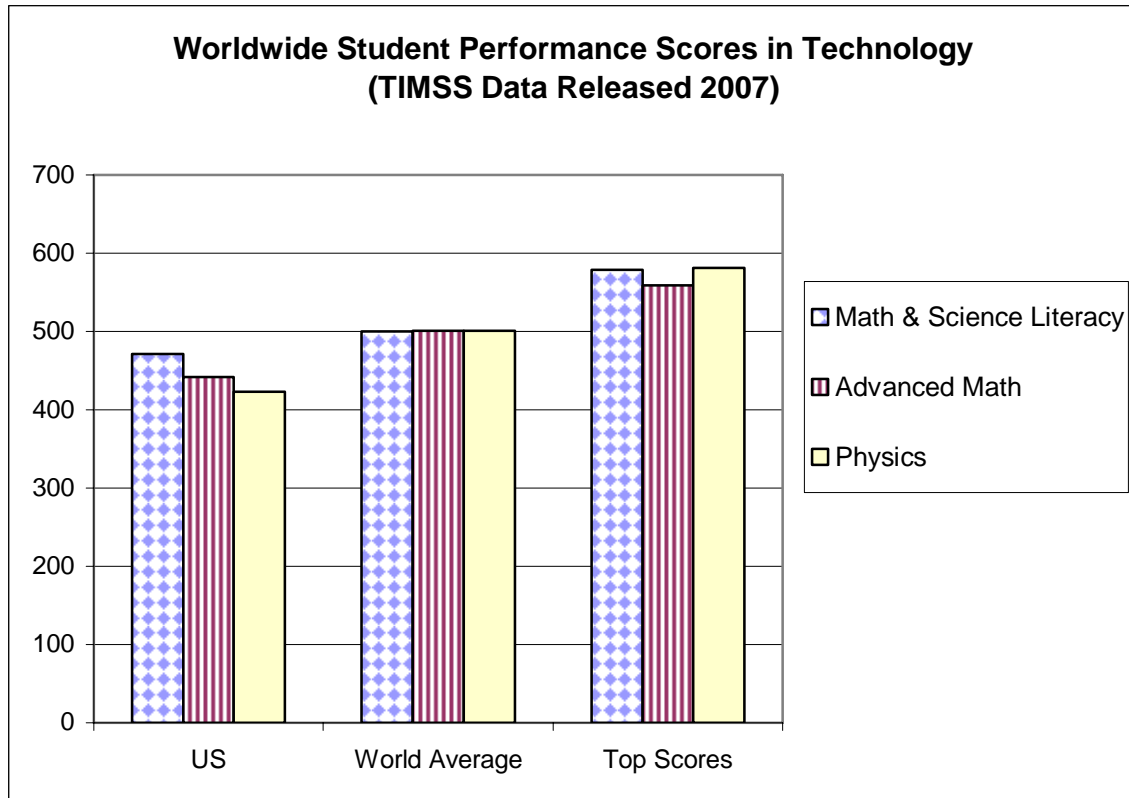
Very few of us think about the country's brain drain. Our attitude seems to be, 'So what? Instead of technology and its products, we'll just sell the world our high-powered legal and business services.' We expect the income from this shift will not only cure the trade deficit but also make up losses from our historical role as world leaders in inventing and developing new technologies - the technologies that have always fueled our industries and created jobs for the masses of fellow Americans less educated, creative, or entrepreneurial.' We forget that such innovations over the last two centuries have produced a broadly shared quality of life that no country in history has matched. Current trends in critical skill demographics say that all of this is rapidly coming to an end. Is then our destiny to become a second-rate country returning to an agrarian economy comprised of mega-farms owned by multi-national corporations?

For a hundred years we have believed that Americans will not do our low-end jobs and therefore we need liberal (or 'blind eye') immigration policies to attract the needed workers. Starting about forty years ago we also came to believe that Johnny and Jane do not want to burden themselves with the education required for wealth-creating technical careers. Recent data suggests that lucrative careers in wealth organization and distribution can be had more easily - we'll instead become middle-men and managers of service businesses, or lawyers and make a ton of money by just suing the bejeezus out of each other.

The point is that the overwhelming number of our country's jobs have always cascaded down from domestic (vs. imported) technological innovation. In the last fifty years the level of such innovation has required skills much harder to come by and not even accessible to over half of our children. The American copy machine repair technician or public relations manager or car mechanic works only because we make the stuff or can afford to buy it. Today a foreign company will no longer send their ideas here to be advertised, or marketed, or manufactured, or repaired unless we have the wealth to buy their stuff. Otherwise what they make, they will sell, service, and support someplace else.

In this short piece I argue that we have a brain drain due to 1) fewer US kids going into high-tech careers, 2) fewer foreign-born technologists coming here or staying here, 3) the resulting brain drain will have near-term cataclysmic results on our quality of life, and 4) the hope for a better future starts with action at the grass roots level instead of waiting for more government programs of the kind that got us there in the first place and keep us there now.

So how are we doing today to maintain our technological competitiveness? We begin with the latest findings of the Third International Mathematics and Science Study released by Boston College on February 24th. TIMSS is the largest international study of student achievement ever undertaken, with more than 500,000 students in 45 countries tested at five grade levels. The chart below summarizes the grim numbers of for our students.



In this context reflect that China has more smart kids (at the right end of the bell curve) chafing at the bit to prepare for technical careers than the total young people enrolled in our K-12 grades, the majority of whom could not master a technical curriculum even if they were motivated to try. Most of our primary and secondary public schools have long lost the edge required to teach technical skills and our culture largely ignores accomplishments in fields other than athletics, entertainment, and the ‘arts’. And when a high school student does go light on science and math, his/her choice for a career in technology creation is effectively eliminated forever.

When we look at our universities and colleges, the good news is that they still offer many of the finest technical degrees (especially at the graduate level) in the world. The bad news double-whammy is that the number of technical degrees awarded keeps shrinking and most of those go to foreign nationals. Senator Joe Lieberman points out that our country is not even smart enough to entice foreign graduates to stay and work here. Most of their home countries are booming and yet we intentionally make it difficult for them to work here. Senator Lieberman writes in a recent piece that “This commencement season, thousands of foreign-born students will be handed American diplomas — and then will be told to pack their bags and leave the country. That is bad news for America's economic growth. ... (our) visa program encourages a brain drain, sending graduates — and their world-class educations — back to their home countries to compete against U.S. businesses.” The demand for our H1-B (skilled worker) visa has been over twice the 65,000

per year allowance that was last set in 1990. He goes on to state that even the proposed improvement to this visa plan

falls short because it fails to exempt from the cap the foreign-born professionals we need most.

When the Senate resumes debating comprehensive immigration reform this week, I will fight to exempt from the cap foreign nationals holding a U.S. graduate degree in any field; a non-U.S. graduate degree in science, technology, engineering or math; or medical-specialty certification based on U.S. training. Taken together, these reforms would deliver much-needed relief — and vital human capital — to our innovative industries.

The high-tech sector has been particularly squeezed by a shortage of homegrown talent. At Microsoft alone, 3,000 domestic positions remain unfilled. And the forecast is grim: Over the next decade, the Labor Department estimates the U.S. economy will create more than 1.4 million jobs in the computer and information science industries.

That's enough jobs to absorb a 75% increase in the number of U.S.-born computer science and math graduates — at a time when the number of American students studying science and technology continues to fall, and more than half of all U.S. postgraduate degrees in math and engineering are awarded to foreign nationals.

The young scientists and engineers of Poland, India, Romania, Estonia, China, Norway, ... will be more than happy to take these jobs inevitably outsourced overseas because we have run out of qualified people. What the good senator did not point out in his 25may07 *Investors Business Daily* article is that our leading high-tech companies have already established multiple technology 'skunkworks' (groups of scientists and engineers doing focused R&D) on foreign soil in order to remain competitive in global markets.

What then should we do at the grassroots level to change course in order to avoid the iceberg? First, we must recognize that these catch-up programs will discriminate in favor of the smart kids and that not all youngsters will be able to enter or compete. No more than any athletic program beyond middle school will this be an equal outcome effort. The participating cohort of youngsters may not represent any of the broad demographic statistics of the land. And like in the NBA, acceptance on a team will be decided strictly on merit which most understand that nature does not distribute evenly.

We should also recognize that we already have scores of programs to involve kids in non-technology pursuits at all levels of ability wherein we volubly celebrate their achievements no matter what their performance level. Those bases have been covered for decades with public and private funding.

The following is a short list of things we should undertake to increase the number of young people headed for technology careers -

- Start celebrating technology and tech performance in lower grades. Put pictures of famous past and current nerds (Bill Gates, Hewlett&Packard, Michael Dell, Steve Jobs, Henry Ford, Thomas Edison, ...) on the wall and show the neat products (video games, computers, computer animated movies, great airplanes, MRI scanner, ...) they and their companies have made that the kids can relate to.
- Get more qualified math-science teachers by reducing artificial barriers set up by government bureaucracy and teachers unions. We have growing legions of early-retired people with technical educations ready to re-enter the workforce as teachers.
- Start and expand local NGOs (foundations, auxiliaries, activist groups, charities,...), service clubs (Rotary, Elks, alumni organizations, ...), and privately-funded youth scholarship programs (e.g. the SESF TechTest merit scholarships).
- Co-ordinate with local middle and high schools to establish community mentoring programs in science and math using retired technicians who are eager to help. These would be to work with kids on both ends of the performance distribution – help those who have difficulty mastering a particular skill/subject, and those who can soar above and beyond what is available in the classroom.

At all stages, focus resources on kids who have the identified and/or demonstrated ability for technical subjects as evident in their daily school performance. We must remember that these will be merit-based programs to fill a critical and growing void. Early and broad-based introduction to the joys of science and math is the equal opportunity part of the program. At best, the capture rate for identifying and motivating such kids will be below one out of ten. It is these ten percent who, properly nurtured through high school, can go on to get the education and do the jobs needed to provide the quality of life and environment that every generation of Americans hopes will still be theirs.