

Rahul Gupta-Iwasaki

PWR2DHA: Making Time for Social Change

Donna Hunter

**America the Happily Unemployed: How Advancing Technology is Rendering Traditional Employment Impossible and the Welfare State Solution**

Farming is the quintessential human profession. People have been growing crops and raising livestock for tens of thousands of years, since the very first settlements and maybe even before. Before the Industrial Revolution swept the West, the vast majority of the world's population worked as farmers, and even today one in three, or around 2.3 billion people, is employed in agriculture. Bountiful farms provide the sustenance for life at the efficiency and scale needed to support once unimaginable populations; indeed, before people learned to tend and cultivate the earth, the total global human population likely had never exceeded 15 million people, less than the number of people living Beijing today, spread all around the globe (Tellier 26; Brinkhoff). Yet now, this oldest and most perfectly human occupation – farming not prostitution – is going to the robots.

That is, if the planners of the Japanese Dream Project have their way. The Dream Project is an initiative focused on innovative ways to reclaim land ravaged by the March 2011 tsunami in the Miyagi prefecture. Think, for a moment, about that most beautiful sight, of the star studded sky on a clear night. Now, imagine flying in an airplane over rural farmland and seeing that same sight, a universe of stars shining up at you – from the ground. This is the Dream Project's 6-year distant experimental farm, upon which a sea of pest repellent LEDs will create a veritable galaxy

on the ground for flyers in the night sky. In the day, rather than farmers wading knee deep in rice paddies, a cohort of robots will trundle across the terrain, performing every operation. From seed to fruit, robots will prepare, plant, tend, and harvest land polluted by oil, salt, and radioactive fallout that no human would want to work. The robots will even infuse it with a little bit of themselves, as they cycle their carbon emissions back into the earth to offset needs for fertilizer (Ito).

As with most experiments in advanced technology, the potential for swift and substantial economic and social return on the Dream Project is rather dubious. While an agriculture ministry spokesman stated that, “We hope the project will help not only support farmers in the disaster-hit regions but also revive the entire nation’s agriculture,” Japan’s agriculture ministry and various private partners expect to invest around 10 billion yen, or 130 million dollars, to make this a reality on a mere 600 acre parcel of land, an unsustainable level of investment for any serious commercial operation (Ito). It will make little immediate difference to Miyagi prefecture’s farmers in the context of the “24,000 hectares of once-fertile farmland damaged by the tsunami” (Ito). And indeed, the food the farm produces will likely never reach a table, given the farm’s situation in fallout ravaged land. Yet in spite of all that, even if each and every robot fails to perform and the LEDs blink off for good, the idea of the Dream Project seems an unavoidable future. It is the inevitable next step in the journey launched when a human first used a stick to dig a hole in the ground, hurried along when people first harnessed a plow to a mule, and given wings when the first tractor rumbled to life with the invention of the steam engine. It is the herald of the transformation of farming into a profession ruled by the mechanized.

Of course, farming is hardly the only human industry being transformed by advancing technology. As the *New York Times* exclaims, “American industries... have achieved a pace of

innovation nearly unmatched in modern history” (“In China”). Breakthroughs in computing power, connectivity, artificial intelligence, robotics, manufacturing, medicine, and more are reshaping industries daily. Yet, this change comes at a pace that today’s economic, regulatory, and societal structures may not be able to keep up with. Noted an Apple executive about the iPhone and iPad in the context of working conditions, “You can either manufacture in comfortable, worker-friendly factories, or you can reinvent the product every year, and make it better and faster and cheaper, which requires factories that seem harsh by American standards” (“In China”). In addition to labor issues, however, technology related unemployment is becoming an increasingly contentious issue. As commenter EuroSon99 sardonically lamented on a Youtube video demonstrating industrial robotics, “And now the most spoken sentence in the 21 Century will [be]: ‘I lost my job’” (e1m1s). In this paper, pointing to examples primarily from the U.S. economy, I posit that we are entering a time during which most workers will just no longer be needed. Advancing technology is eliminating and exporting jobs faster than it is creating them, as well as pushing those that do exist out of the reach of the average citizen, which will lead to an unprecedented sustained rapid decline in job opportunities that will strain social and economic institutions. One solution, I conclude, can be found in a reevaluation of the traditional work-to-live paradigm and an embrace of the universal welfare state.

### **The Decline of Middle America**

With every period of radical technological change has come an equally significant shift in the landscape of where people work. In just the 1900’s, a century including revolutions in computing, communications, and transportation as well as the invention of “the x-ray, wind

tunnel, arc welder, circuit breaker, transistor, Geiger counter, laser, ... fiber optics, [and] stainless steel,” the U.S. labor force “shifted from industries dominated by primary production occupations, such as farmers and foresters, to those dominated by professional, technical, and service workers.” By 1999, farming employed less than 3% of workers, down from 38% in 1900, while “goods-producing industries, such as mining, manufacturing, and construction,” employed only 19%, down from 31%. On the other hand, the services sector employed a full 78% of the work force at the end of the century, up from only 31% at its start (Fisk). As Duhigg and Bradsher put it, “Modernization has always caused some kinds of jobs to change or disappear... farmers became steelworkers, and then salesmen and middle managers.” Indeed, they add, “these shifts have carried many economic benefits, and in general, with each progression, even unskilled workers received better wages and greater chances at upward mobility.” Yet, I argue, this trend cannot continue forever. Rather, in developed economies we have reached a point where each innovative cycle destroys more mid-level jobs than it creates, pushing the remaining jobs further out of reach for many of those left unemployed and increasing wealth and opportunity disparity.

First, I must define mid-level jobs and establish their importance. In this paper, “Mid-level” is a broad descriptor adapted from the definition given by the Washington Workforce Board that identifies any job requiring at least some amount of “post-high school training or education but less than a bachelor’s degree” – those positions in between low-skilled jobs like employment at a local McDonalds and high-skilled jobs like that of a scientist or engineer (Washington). While people with mid-level jobs are often referred to as “unskilled labor,” a more accurate description might be that of middle-skilled worker. Ettliger and Gordon’s comments about manufacturing, the classic mid-level job, apply to the whole category – “[these]

jobs serve an important role, offering economic opportunity to hard-working, middle-skill workers. This creates upward mobility and broadens and strengthens the middle class to the benefit of the entire economy” (1). While “Sicherman (1991) shows that in the USA there is a trade-off between the different sources of human capital, especially between schooling and learning-by-doing,” middle-skill positions give the 73% of working-age<sup>1</sup> Americans without a bachelor’s degree a chance to make a decent wage without advanced education (Decreuse 663; Stoops 3). Again considering manufacturing as rather emblematic of mid-level jobs as a whole, Harvard Business School professors Pisano and Shih emphasize the impact these jobs have on the quality of life of much of America. Restoring U.S. manufacturing, especially of high-tech products, they write, “is the only way the country can hope to... maintain, let alone raise, its citizens’ standard of living” (114).

But, mid-level jobs are also where the impact of technological innovations is concentrated and where most of the resultant job destruction and wage erosion takes place. As Decreuse describes it, “The deterioration of the economic position of unskilled workers during the last two decades is well documented...” the reason for which “Authors generally point to a shift in labor demand against unskilled/low educated workers,” a trend “thought to reflect skill-biased technological change” – the term economists use for job-eliminating, technology-based innovation – “against unskilled workers” (651). Indeed, it is the very factors that make mid-level jobs so attractive to workers – a decent wage coupled with lower education and skill requirements – that also render them so vulnerable to replacement by technology. The way companies see them, mid-level jobs represent a sweet spot of savings – they have the perfect combination of higher labor costs and relative ease of automation. As Adam Davidson puts it in the *Atlantic*, “common in factories” is the practice of investing “only in machinery that will earn

---

<sup>1</sup> Age 25 and above

back its cost within two years.” While a worker “makes less in two years than [a] machine would cost... her job is safe,” but “if the robotic machines become a little cheaper” or demand goes up, “investing in those robots might make sense.” In the end, in our profit-driven economy, the only jobs that survive are those for which labor costs stay smaller than the often decreasing costs of replacement technology. Though most companies likely hardly take pleasure in getting rid of their human workers, this still means that for many of the jobs that remain, wages are kept low to keep them below the cost of replacement. In one example, Berman, Bound, and Machin point out that “between 1979 and 1993, ... real wages of young men with twelve or fewer years of education *fell* by 26 percent ... in the United States ... and have not recovered since” (1245). As well, where organizations spend their R&D dollars is often indicative of their mindset and where they hope to make money, and indeed, “case studies conducted by the Bureau of Labor Statistics Office of Productivity and Technology that indicate the nature of innovations often mention innovations that [lower] or are expected to lower production labor requirements” (Berman, Bound, and Machin 1246). With continually dropping costs and increasing capabilities of technology, more and more middle-skilled laborers will find themselves out of the job or left with an untenably low income.

At the same time as mid-level jobs are eliminated, technology often spurs job creation and wage increases for higher skilled positions, leading some to herald increased education as the solution to high technology induced job displacement. Trumpets Thomas Friedman in the *New York Times*, “there are many things we need to do to buttress unemployment, but nothing would be more important than... [ensuring] that every American has access to post-high school education.” While I can hardly say that I don’t believe in the power of education, Friedman fails to truly appreciate how far automating technology will reach. Education does indeed pave the

way to a smooth transition upwards for a modernizing economy. Fisk emphasizes how in the 20<sup>th</sup> century “Education played an important role in the advancement of the individual worker,” and looking again at Duhigg and Bradsher’s description of shifts in occupation resultant from modernization – “farmers became steelworkers, and then salesmen and middle managers” – the trend of each step requiring more schooling is clear (Duhigg and Bradsher). However, the leap in knowledge required between each step is not too huge. At this stage, “In response to a shift in demand against unskilled labor, households” merely “alter their schooling choices and a larger proportion acquires skills” (Decreuse 652).

Now, however, I posit that technology is nearing the point where the skill gap will be too large to easily cross. In 1978 respected computer scientist Margaret Boden noted how a very basic program “for the diagnosis of peptic ulcers” was rated by patients as “more friendly, polite, relaxing, and comprehensible than the average physician.” She extrapolated, musing that “These chastening observations about the superiority of the personal habits of programs over those of human doctors can doubtless be expected also with regard to automatic lawyers, bureaucrats, and teachers” (748-9). While we may not yet have automatic lawyers or teachers – today, companies like Blackstone Discovery are developing software that has brought the price of legal analysis of documents down by over 500% since just 30 years ago (Markoff). Startups like Narrative Science have programs that produce articles for actual publications, with quality improving so quickly that founder Kris Hammond talks about his expectations that a computer will win the Pulitzer Prize within the next 5 years (Lohr). We have reached the point where automation no longer threatens just middle-skilled mid-level jobs, but is even reaching its tendrils into once prototypically safe occupations that require some of the highest amounts of education.

Technology is knocking more and more job-based rungs off the ladder to socioeconomic achievement, making it ever more unlikely that the already disadvantaged will be able to cross the skill gap to success. Education will no longer be enough, and this inability to empower people to recover from being shunted aside by skill-biased technological change will result in dramatically increased disparity in wealth and future opportunity. As Carnegie Mellon robotics researcher Hans Moravec dramatizes, “Advancing computer performance is like water slowly flooding the landscape. A half-century ago it began to drown the lowlands, driving out human calculators and record clerks, but leaving most of us dry. Now the flood has reached the foothills, and our outposts there are contemplating retreat. We feel safe on our peaks, but at the present rate, those too will be submerged within another half-century” (Epstein 230).

### **Globalization as Symptom, not Counter-Argument**

In discussing how the “Routine tasks... characteristic of many middle-skilled cognitive and production activities” enable automation through software and robotics, MIT economist David Autor also notes how these tasks can also be “sent electronically to foreign worksites to be performed by comparatively low-wage workers,” another way of cutting costs (4). Essentially, he is describing globalization induced outsourcing. Indeed, it is important to note that globalization and outsourcing are oft alternatively cited as the real culprit to declining mid-level employment opportunities and increasing polarization. Moore and Ranjan summarize about this line of thought: “The intuition for the effects of globalization is straightforward. Since globalization increases the price of the skilled intermediate,” i.e. the skilled laborer who can drive research and manage globalized operations, “and decreases the price of the unskilled

intermediate good” by taking advantage of cheaper unskilled labor and increasing the size of the labor pool, “unemployment falls in the skilled sector but rises in the unskilled sector” (392).

However, I argue that outsourcing is not so much a separate cause of technological unemployment rather than more of an early-onset symptom of that same base motivator behind skill-biased technological change, the pursuit of profit.

While many companies do go directly from employing industrialized workers to automation, outsourcing provides a half-way step in which companies without an easily adoptable automated solution can at least push down labor costs. Outsourcing is, however, not a permanent solution, as that very influx of foreign investment that outsourcing means for underdeveloped countries generates new wealth, empowering the people and eventually driving up quality of life and with it cost-of-living. Eventually, as automation costs inexorably fall and labor costs rise, companies are forced either to move their operations or automate in the pursuit of profit. China is a prime instance of a country to which modernizing countries have outsourced jobs, and, in a recent example, Apple, through Foxconn, was forced to “sharply raise salaries and reduce overtime at its Chinese factories.” Though the immediate reason was due to foreign concerns about working conditions, the *New York Times* noted that Chinese manufacturers’ entire model “is under pressure. A new generation of young people in China are more reluctant to migrate to coastal cities, live in factory dorms, and toil long hours.” Increasing wealth due to the West’s outsourcing has pushed living and working expectations up, to the point where “worried that the old model is dying, Foxconn,” one of China’s largest employers with 1.2 million people and the manufacturer of an estimated 40% of the world’s electronic gadgets, “has announced plans to invest in millions of robots and automate aspects of production” (“Pressure”; “Human Costs”). And indeed, globalization can even be seen as not just a companion but also a

compounding factor to innovation in technological unemployment. Describes Sener in the *Journal of International Economics*: “A reduction in trade barriers” leading to globalization “increases the profitability of R&D by augmenting the temporary monopoly profits enjoyed by winner firms. This stimulates more firms to engage in R&D production.” Using the idea that innovative companies also contribute to unskilled unemployment by way of “creative destruction,” or essentially putting their competitors out of business, it follows that, “the higher frequency of innovations increases the turnover rate of unskilled workers by speeding up the creative destruction process.” In turn, “This increases the frictional unemployment rate of unskilled workers” (Sener 124). With globalization opening up bigger markets, corporations have an increased incentive to pursue R&D driven monopolies or advantages over competitors, something that also leads to increasing unemployment as competing companies suffer and accelerates the pace of unemployment-causing skill-biased technological change. Indeed, while many continue to advance globalization as the true cause behind rising mid-level loss of opportunity in the United States and other modernized nations, arguing the almost platitude point that technological progress will always create as many or more jobs than it obsoletes, globalization is really only the steam from the locomotive that is rapidly progressing technology. Both are driven by the same engine, yet one is radically more dangerous.

### **The Purpose of Work and State**

Alas, are we doomed by our own genius? Are we destined to the sad fate of being sidelined by our own creations? Less theatrically – what is it that we can do to manage the threat of long-term high rates of unemployment and increasing disparity in both wealth and

opportunity? The fact of the matter is, progress is inexorable, and railing against advancing technology or interconnected markets or the pursuit of profit is neither useful nor helpful. I have used perhaps rather pointed rhetoric so far with the goal of emphasizing the real danger we face, but now I would like to discuss the opportunities I see provided to us in our situation and why I am hopeful for the future. As I see it, traditional employment is a broken system that forces people to occupy their lives with uninteresting tasks, one that we have been stuck with due to inertia and a lack of viable alternatives. Now, as the fruits of our lust for progress and innovation begin to break that system, I propose that we not fight it but rather seize the chance to embrace a better system with more fulfilling occupations. Central to this however, is a fundamental shift from the work-to-live paradigm towards one where in which the government ensures a baseline standard of living.

Internet magazine *UGO* recently ran an article titled “11 Reasons Geeks Hate the Big Bang Theory,” a hit TV show parodying Geek subculture, and, interestingly, their final reason was simply that “at the end of the day... we know plenty of geeks who would be better protagonists... Most scientists we know are the absolute opposite of the stereotype on the show – when you’re super-smart, you spend your time working on world-changing projects, not visiting the comic book store every Wednesday.” Rather, “The real geek is too busy subtitling anime or [hacking videogames] to keep a job like that” (Jensen). While the article was merely a throwaway pop culture piece to feed the content-hungry internet masses, this casual last complaint is also evidence of how ingrained the notion of a common dislike for the jobs that we have to do is in American culture. Unhappy workplaces are regularly the subject of ire, with stories of horrible bosses or coworkers and the like becoming part of lore, and indeed, the popularity of shows like *The Office* is based in communal workplace suffering. Furthermore, the

trend extends beyond just America; as a 2008 Towers Perrin study of over 90,000 workers worldwide discovered, only 21% of employees could be considered fully invested in their work, while a full 38% were disenchanted or disengaged (“Closing” 4). Given how much of our waking lives work consumes, this is a truly tragic figure. For an unfortunate number of people – work is actually an impediment to what they want to do, rather than something enjoyable or fulfilling.

Thus, given that traditional employment is so disliked by so many people, I see little compelling reason to struggle against the advance of technology. Instead, I propose that we take advantage of the opportunity to free ourselves from jobs that contribute little to our happiness, and rather embrace the sort of “amateur culture” that celebrated lawyer Larry Lessig elaborates on in his TED talk, “Laws that Choke Creativity” – a culture not “amateurish” but rather one “where people produce for the love of what they’re doing and not for the money” (7:50). This would allow people to make the most of their lives by pursuing their passions and lead to a cultural explosion as people focus their efforts in more human and less rote activities, a world I call “post-employment.” Of course, several issues immediately present themselves. The question begs to be asked, how are people going to support themselves without earning money? This is undeniably the reason people work so hard to get and keep their jobs, however much they may dislike them. And, will people actually be happier if left to their own devices? “Incorporated in the self-image of most Westerners is the Protestant Ethic that only hard work is a really serious activity,” where “‘work’ is implicitly defined as paid, as done in one’s employer’s time rather than in one’s own ‘leisure’ time, and at the employer’s behest rather than for one’s own purposes,” an attitude that certainly hurts people today left without work (Boden 749). These issues cannot be ignored, and, coupled with the fact that technologically induced unemployment

is an ongoing process and one that can be neither rushed nor preempted, lead me to suggest the gradual adoption of a government guaranteed quality of life, or universal basic income. This will give society time to adjust to the mindset of working for itself and free people up to a certain point from having to support themselves, allowing them to subsequently embark on pursuing their own interests.

As Bay and Pedersen note in *Acta Sociologica*, “leading proponents” of universal basic income describe it as “a blueprint for social justice that is capable of reconciling classical liberal concerns for freedom, efficiency and equality” (419). Hardly communism, it merely considers a baseline standard of living a human right, and leaves people free to pursue unlimited material gains above and beyond that. However, the resources required make basic income infeasible today, and, while *The Economist* laments it as “extremely peculiar” preference “from an efficiency standpoint,” given the attitude toward work noted by Boden above, currently artificial job stimulation is considered politically preferable to income redistribution (R.A.). Thus, I propose the initial stage of implementation as the advancement of livable unemployment benefits, approached with the attitude that “What [the unemployed] are doing for us is occupying slots... that someone has to occupy in an economy with any appreciable level of structural unemployment; and unemployment benefits... [are] payments to them for that service” (Groot 226). This solves the problem of resource cost as it requires but a relatively minimal increase in immediate resource load due to unemployment. Over time, as unemployment rises and fewer and fewer humans work to produce, more and more material value is produced through automation. And, since technology has no need to reap the benefits of its produce, the excess value from automation can be cycled back to humanity through these “unemployment benefits.” As well, it allows for the voluntarily unemployed, or those early adopters of post-unemployment, to live as

they wish, while at the same time not forcing change but rather simply keeping up with the pace of automation. Societal attitudes towards traditional work will shift on their own as more and more people discover the benefits of comfortable job-free living. Once automation and corresponding unemployment has reached a critical mass and cultural acceptance of post-employment has taken root, finally universal basic income can be officially adopted, though by this point it will likely make little difference from the already in place scaled unemployment benefits. People will be free to pursue their passions rather than strive simply to survive, while those who still wish can continue to do business and advance their own material wealth beyond the guaranteed baseline. Such is the fully fulfilling, always engaged life.

## **Conclusion**

The truth is, robotic farms like those envisioned by the Japanese Dream Project are just the beginning. While technological progress and innovation have ever been trumpeted as the proud companions of civilization, today they are reaching the point where the level and pace of change are leading to a net loss in a widening range of mid-level jobs. This strikes at the stability of society itself by threatening socioeconomic polarization through increasing disparity in wealth and opportunity. However, as opposed to fighting against our own curiosity and ingenuity to preserve a system of employment that leaves vast numbers unfulfilled, let us instead evolve the post-employment world, dedicating ourselves to our own passions. While it requires shift in cultural mindset and an acceptance of universal income, it is not an impossible change through the gradual adoption of technologically enabled living welfare. At last, though we may not have that long to go before even more radical changes – futurists like Ray Kurzweil predict the

melding of man and machine within the century – let us now seize the opportunity to escape the trappings of the 9-to-5 and live engaged lives of impassioned pursuit.

### Works Cited

- Autor, David. "The Polarization of Job Opportunities in the U.S. Labor Market: Implications for Employment and Earnings." Center for American Progress, and The Hamilton Project. Apr 2010. Web. 24 Mar 2012.
- Bay, Ann-Helen, and Axel West Pedersen. "The Limits of Social Solidarity: Basic Income, Immigration and the Legitimacy of the Universal Welfare State." *Acta Sociologica* 49.4 (2006): 419-36. *JSTOR*. Database. 2 Feb 2012.
- Berman, Eli, John Bound, and Stephen Machin. "Implications of Skill-Biased Technological Change: International Evidence." *The Quarterly Journal of Economics* 113.4 (Nov 1998): 1245-1279. *JSTOR*. Database. 7 Mar 2012.
- Boden, Margaret A. "Social Implications of Intelligent Machines." *ACM '78 Proceedings of the 1978 annual conference*. (1978): 746-52. *ACM Digital Library*. Web. 6 Mar 2012.
- Brinkhoff, Thomas. "The Principle Agglomerations of the World." *City Population*. N.p., 01 Jan 2012. Web. 20 Feb 2012. <<http://citypopulation.de/world/Agglomerations.html>>.
- "Closing the Engagement Gap: A Road Map for Driving Superior Business Performance." *Towers Perrin Global Workforce Study*. 2007-2008. Towers Perrin. Web. 25 Mar 2012.
- Davidson, Adam. "Making it in America." *Atlantic*. Jan/Feb 2012: Web. 20 Feb. 2012. <[http://www.theatlantic.com/magazine/archive/2012/01/making-it-in-america/8844/?single\\_page=true](http://www.theatlantic.com/magazine/archive/2012/01/making-it-in-america/8844/?single_page=true)>.
- Decreuse, Bruno. "Can Skill-Biased Technological Change Compress Unemployment Rate

- Differentials across Education Groups?" *Journal of Population Economics* 14.4 (Dec 2001): 651-67. *JSTOR*. Database. 22 Feb 2012.
- Duhigg, Charles, and David Barboza. "In China, Human Costs Are Built Into an iPad." *New York Times* 26 Jan 2012, New York Ed. A1. Web. 14 Feb. 2012.
- , and ---. "Pressure, Chinese and Foreign, Drives Changes at Foxconn." *New York Times* 19 2 2012, New York Ed. B1. Web. 26 Feb. 2012.
- , and Keith Bradsher. "How the U.S. Lost Out on iPhone Work." *New York Times* 22 Jan 2012, New York Ed. A1. Web. 24 Jan. 2012.
- e1m1s. "Industrial Robotics." *Youtube*. 17 Aug. 2007. Web. 27 Feb. 2012.  
<<http://www.youtube.com/watch?v=DkNVhtOCcrE>>.
- Epstein, Richard G. "How Hiring: Dogs and Humans Need Not Apply." *Ethics and Information Technology* 1.3 (1999): 227-236. *PhilPapers*. Database. 25 Mar 2012.
- Ettlinger, Michael, and Kate Gordon. "The Importance and Promise of American Manufacturing: Why It Matters if We Make It in America and Where We Stand Today." Center for American Progress. Apr 2011. Web. 27 Feb. 2012.
- Fisk, Donald M. "American Labor in the 20th Century." Bureau of Labor Statistics. United States Department of Labor, 30 Jan 2003. Web. 27 Feb 2012.
- Friedman, Thomas L. "Average is Over." *New York Times* 25 Jan 2012, New York Ed. A29. Web. 25 Jan. 2012.
- Groot, Loek. "Basic income, unemployment and job scarcity." *Louvain Economic Review* 70.2 (2004): 223-41. *JSTOR*. Database. 22 Feb 2012.
- Ito, Shingo. "Japan Plans Futuristic farm in Disaster Zone." Google. AFP, 04 Jan 2012. Web. 20

- Feb 2012. <[http://www.google.com/hostednews/afp/article/ALeqM5gr9wItZr\\_n5h3gcE2aC9KKqgDqVQ?docId=CNG.4c36a1c36bb21503f1a48bcc95677ffd.381](http://www.google.com/hostednews/afp/article/ALeqM5gr9wItZr_n5h3gcE2aC9KKqgDqVQ?docId=CNG.4c36a1c36bb21503f1a48bcc95677ffd.381)>.
- Jensen, K. Thor. "11 Reasons Geeks Hate The Big Bang Theory." *UGO*. UGO Entertainment, 12 Jan 2012. Web. <<http://www.ugo.com/tv/11-reasons-geeks-hate-the-big-bang-theory>>.
- Lessig, Larry. "Larry Lessig on laws that choke creativity." *TED: Ideas Worth Spreading*. Web. 22 Feb 2012.
- Lohr, Steve. "In Case You Wondered, a Real Human Wrote This Column." *New York Times* 11 Sep 2011, New York Edition BU3. Web. 23 Jan. 2012.
- Markoff, John. "Armies of Expensive Lawyers, Replaced by Cheaper Software." *New York Times* 05 Mar 2011, New York Ed. A1. Web. 23 Jan. 2012.
- Moore, Mark P. and Priya Ranjan. "Globalisation vs Skill-Biased Technological Change: Implications for Unemployment and Wage Inequality." *The Economic Journal* 115.503 (Apr 2005): 391-422. *JSTOR*. Database. 22 Feb 2012.
- Pisano, Gary P., and Willy C. Shih. "Restoring American Competitiveness." *Harvard Business Review* 87.7/8 (2009): 114-125. *Business Source Complete*. Web. 27 Feb. 2012.
- R.A. "How Important is it to Make Things?" *The Economist* 30 Aug 2011. Web. 25 Mar 2012. <<http://www.economist.com/blogs/freeexchange/2011/08/manufacturing>>.
- Şener, Fuat. "Schumpeterian unemployment, trade and wages." *Journal of International Economics* 54.1 (Jun 2001): 119-148. *SciVerse*. Database. 22 Feb 2012.
- Stoops, Nicole. "Educational Attainment in the United States: 2003." United States Census Bureau. June 2004. Web. 27 Feb. 2012. <<http://www.census.gov/prod/2004pubs/p20-550.pdf>>.
- Tellier, Luc-Normand. *Urban World History*. Presses de l'Universite du Quebec, 2009. 26.

eBook. <<http://books.google.com/books?id=cXuCjDbxC1YC>>.

“Washington Mid-Level Skill Gap Analysis.” Workforce Training and Education Coordinating Board. Web. 27 Feb. 2012. <<http://www.wtb.wa.gov/skillgap.asp>>.