

A Field Guide to ‘Jobs that Don’t Exist Yet’

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Editor's Note

This was originally posted to [Benjamin Doxtdator's blog \[https://edtechbooks.org/-Kfh\]](https://edtechbooks.org/-Kfh) on July 8, 2017.

The statistic you either love or hate

Thanks to the [Shift Happens \[https://edtechbooks.org/-Cur\]](https://edtechbooks.org/-Cur) videos (2007), you will likely be familiar with this statistic about the future of work:

“The top 10 in demand jobs in 2010 did not exist in 2004. We are currently preparing students for jobs that don’t exist yet, using technologies that haven’t been invented, in order to solve problems we don’t even know are problems yet.”

People repeat the claim again and again, but in slightly different forms. Sometimes they remove the dates and change the numbers; 65% is now in fashion. Respected academics who study education, such as [Linda Darling-Hammond](https://edtechbooks.org/-bGY) [https://edtechbooks.org/-bGY] (1:30), have picked up and continue to repeat a mutated form of the factoid, as has the [World Economic Forum](https://edtechbooks.org/-efV) [https://edtechbooks.org/-efV] and the [OECD](https://edtechbooks.org/-Mje) [https://edtechbooks.org/-Mje]. It takes some work to find out that the claim is not true. When I tried to find an original source for the claim, I was surprised to find out that versions of it date from at least to 1957. Interestingly, in 1973 Norman Kurland said such statements ‘typified’ the 1970s discourse about how jobs are supposed to change, but the claim now appears new and radical in 21st century videos like *Shift Happens*. I’ll get to that deeper history soon.

The *Shift Happens* video, originally made by Karl Fisch as a presentation and turned into a [viral video](https://edtechbooks.org/-xzQ) [https://edtechbooks.org/-xzQ] by Scott Mcleod, situates the claim in Thomas Friedman’s ‘flat’ world perspective that concerns itself with America retaining a ‘comparative advantage’ in rapidly changing times. Right between statistics about the rise of China and India and the historical decline of the British Empire, the video drops the claim about ‘in demand jobs’ and attributes it to Richard Riley, Bill Clinton’s Secretary of Education. Even though it lacks his linguistic ‘secret sauce’, I had bet that Thomas Friedman might have been an original source for the claim because it fits so well with his neoliberal perspective. In the notes to the video, Fisch gives [Ian Jukes](https://twitter.com/ijukes) [https://twitter.com/ijukes] as a [source](https://edtechbooks.org/-Yuo) [https://edtechbooks.org/-Yuo], and in an email conversation with Jukes, he was kind enough to confirm: “I was in attendance

at an event (the SC Summit) in Columbia, South Carolina on or about [Aug 7, 2006 \[https://edtechbooks.org/-Qnw\]](https://edtechbooks.org/-Qnw)– Riley was the opening keynote – that quote is word for word (or as close as I was able to record) to what he had to say.” Incidentally, [Bill Clinton \[https://edtechbooks.org/-KBh\]](https://edtechbooks.org/-KBh)– certainly a flattener in Friedman’s eyes – made such a claim a decade earlier in 1996 in Birmingham:

“This is the last election for President of the 20th century and the first election for President of the 21st century. And you have to decide. Many of you young people in this audience, in a few years you will be doing jobs that haven’t been invented yet. Some of you will be doing work that has not even been imagined yet. And you have to decide: what kind of America do you want.”

[The brush Bill Clinton painted ‘free-trade’ with \[https://edtechbooks.org/-VQg\]](https://edtechbooks.org/-VQg) is still being used to color in an awful lot of education books in 2017:

“Change is upon us. We can do nothing about that.”

Is the claim stated as a statistic true? [Andrew Old \[https://edtechbooks.org/-gyeg\]](https://edtechbooks.org/-gyeg) and more recently [Michael Berman \[https://edtechbooks.org/-EPk\]](https://edtechbooks.org/-EPk) and the [BBC \[https://edtechbooks.org/-ISf\]](https://edtechbooks.org/-ISf) have provided a solid de-bunking.

But why does the claim continue to circulate? What ideology

does it serve?

Future Proof?

The OECD uses a version of the claim to frame their [Case for 21st Century Learning \[https://edtechbooks.org/-Mje\]](https://edtechbooks.org/-Mje), as does the World Economic Forum in their [Future of Jobs \[https://edtechbooks.org/-UmG\]](https://edtechbooks.org/-UmG) (2016) report. More recent versions of the claim have removed specific dates, and switched from talking about the top ‘in demand jobs’ to talking about a percentage – 65% is the magic number – of children who will work in jobs that haven’t been invented yet.

Yet, the claim serves the same function as it did in the *Shift Happens* videos: to suggest that education has failed to keep pace with, and prepare our children for, an ever changing world of work. In the face of this known unknown, the only answer is to instill flexibility and adaptability along with ‘skills’ like creativity. [Keri Facer \[https://edtechbooks.org/-oQx\]](https://edtechbooks.org/-oQx) gives us a helpful term for this narrative: the ‘future proofing’ narrative “suggests that there is only one question about socio-technical change that the ‘future-proof’ school needs to address: namely, how successfully will the school equip young people to compete in the global economy of tomorrow?”

This logic is so pervasive that we barely notice it. Even reformers that appear progressive, such as Ken Robinson, ultimately link progressive values like creativity to work. A century ago, the logic of future proofing went under the name ‘social efficiency’, but that branch of the progressive movement found vigorous opposition in [John Dewey \[https://edtechbooks.org/-LU\]](https://edtechbooks.org/-LU) who said that as a matter of

politics, the “education in which I am interested is not one which will ‘adapt’ workers to the existing industrial regime; I am not sufficiently in love with the regime for that.”

Now, social efficiency in the language of ‘future proofing’ is embedded in the neoliberal ideology that equates freedom with free markets, and makes the individual solely responsible for her own fate. As much as the claim is an indictment of schools, it also serves as a warning to individuals. Be a ‘lifelong learner’ or else. When [Andreas Schleicher](https://edtechbooks.org/-CQL) [https://edtechbooks.org/-CQL] of the OECD repeats the claim (with no source), he makes clear that only our imaginations and not material circumstances might hold us back in life: “As columnist and author Thomas Friedman puts it, because technology has enabled us to act on our imaginations in ways that we could never before, the most important competition is no longer between countries or companies but between ourselves and our imagination.”

The WeF [Future of Jobs](https://edtechbooks.org/-UmG) [https://edtechbooks.org/-UmG] report exemplifies the future proofing ideology and Thomas Friedman’s methodology by making an “extensive survey of CHROs and other senior talent and strategy executives of leading global employers” (p. 3) to learn about the future of work, which then drives their future of education policy:

“By one popular estimate 65% of children entering primary schools today will ultimately work in new job types and functions that currently don’t yet exist. Technological trends such as the Fourth Industrial Revolution will create many new cross-

functional roles for which employees will need both technical and social and analytical skills. Most existing education systems at all levels provide highly siloed training and continue a number of 20th century practices that are hindering progress on today's talent and labour market issues. ... Businesses should work closely with governments, education providers and others to imagine what a true 21st century curriculum might look like."

In this narrative, the education system hinders progress, thus steering the conversation away from explicit economic policies, which are often driven by corporations and Capital. The *Future of Jobs* cites the *Shift Happens* videos as their source, but switches the statistic (or confuses the prediction) from 'top 10 in demand jobs' to the figure of '65% of children' while dropping the date which has expired by seven years now. That post-modern pastiche, and repetition without referent, becomes exhausting.

Perhaps most importantly, the *Future of Jobs* relies on the perspective of CEOs to suggest that Capital has lacked input into the shape and direction of education. Ironically, the first person I found to make the claim about the future of jobs - Devereux C. Josephs - was both Businessman of the Year (1958) and the chair of Eisenhower's President's Committee on Education Beyond High School. More tellingly, in his historical context, Josephs was able to imagine a more equitable future where we shared in prosperity rather than competed against the world's underprivileged on a 'flat' field.

The Political Shift that Happened

While the claim is often presented as a new and alarming fact or prediction about the future, [Devereux C. Josephs](https://edtechbooks.org/-yvh) [https://edtechbooks.org/-yvh] said much the same in 1957 during a Conference on the American High School at the University of Chicago on October 28, less than a month after the Soviets launched Sputnik. If Friedman and his ‘flat’ earth followers were writing then, they would have been up in arms about the technological superiority of the Soviets, just like they now raise the alarm about the rise of India and China. Josephs was a past president of the Carnegie Corporation, and at the time served as Chairman of the Board of the New York Life Insurance Company.

While critics of the American education system [erupted](https://edtechbooks.org/-sFaA) [https://edtechbooks.org/-sFaA] after the launch of Sputnik with calls to go back to basics, much as they would again decades later with *A Nation at Risk* [https://edtechbooks.org/-qNo] (1983), Josephs was instead a “besieged defender” of education according to [Okhee Lee and Michael Salwen](https://edtechbooks.org/-jggH) [https://edtechbooks.org/-jggH]. Here’s how Joseph’s talked about the future of work:

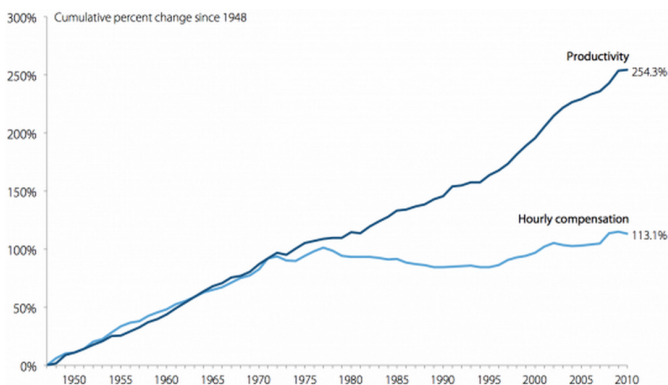
“We are too much inclined to think of careers and opportunities as if the oncoming generations were growing up to fill the jobs that are now held by their seniors. This is not true. Our young people will fill many jobs that do not now exist. They will invent products that will need new skills. Old-fashioned mercantilism and the nineteenth-century theory in

which one man's gain was another man's loss, are being replaced by a dynamism in which the new ideas of a lot of people become the gains for many, many more."⁴ Devereux C Josephs, [The Emerging American Scene, The School Review, Vol. 66, No. 1 \(Spring, 1958\) \[https://edtechbooks.org/-yvvh\]](https://edtechbooks.org/-yvvh)

Josephs' claim brims with optimism about a new future, striking a tone which contrasts sharply with the *Shift Happens* video and its competitive fear of The Other and decline of Empire. We must recognize this shift that happens between then and now as an erasure of politics - a deletion of the opportunity to make a choice about how the abundant wealth created by automation - and perhaps more often by offshoring to cheap labor - would be shared.

The agentless construction in the *Shift Happens* version - "technologies that haven't been invented yet" - contrasts with Josephs' vision where today's youth invent those technologies. More importantly, Josephs imagines a more equitable socio-technical future, marked not by competition, but where gains are shared. It should go without saying that this has not come to pass. As productivity shot up since the 1950's, worker compensation has stagnated since around 1973.

Growth of real hourly compensation for production/nonsupervisory workers and productivity, 1948–2011



Note: Hourly compensation is of production/nonsupervisory workers in the private sector and productivity is for the total economy.

Source: Author's analysis of unpublished total economy data from Bureau of Labor Statistics, Labor Productivity and Costs program and Bureau of Economic Analysis, National Income and Product Accounts public data series

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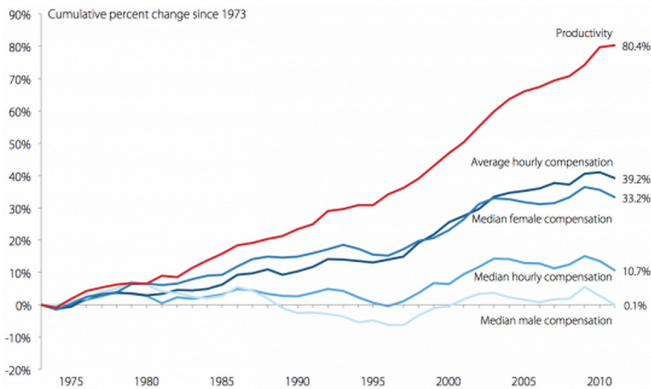
Source: epi.org [<https://edtechbooks.org/Wiv>]

In other words, the problem is not that Capital lacks a say in education, but that corporations and the 0.1% are reaping all the rewards and need to explain why. Too often, this explanation comes in the form of the [zombie idea](https://edtechbooks.org/Bo) [<https://edtechbooks.org/Bo>] of a 'skills gap', which persists though it [keeps being debunked](https://edtechbooks.org/dNX) [<https://edtechbooks.org/dNX>]. What else are CEOs going to say – and the skills gap is almost always based on an opinion survey – when they are asked to explain stagnating wages?

Josephs' essay echoes [John Maynard Keynes'](#)

[\[https://edtechbooks.org/-vHG\]](https://edtechbooks.org/-vHG) (1930) in his hope that the “average family” by 1977 “may take some of the [economic] gain in the form of leisure”; the dynamism of new ideas *should have* created gains for ‘many, many more’ people. Instead, the compensation for CEOs soared as the profit was privatized even though most of the risk for innovation was socialized by US government investment through programs such as DARPA.

Growth of hourly productivity, real average hourly compensation, and real median hourly compensation (overall and by gender), 1973–2011



Note: Compensation is for production/nonsupervisory workers in the private sector, and productivity is for the total economy.

Source: Author’s analysis of unpublished total economy data from the Bureau of Labor Statistics, Labor Productivity and Costs program and Bureau of Economic Analysis, National Income and Product Accounts public data series

Economic Policy Institute

Source: epi.org [\[https://edtechbooks.org/-Wiv\]](https://edtechbooks.org/-Wiv)

Those robots that are always threatening to take our jobs, like

Baxter, are the product of government funding going back at least to 1990 when Rodney Brooks, creator of the Roomba, founded iRobot whose [first project](https://edtechbooks.org/-oUg) [https://edtechbooks.org/-oUg] was to “build a six-legged insectlike robot named Attila for NASA’s Jet Propulsion Laboratory.” The article explains that “early revenue [for iRobot] came from research contracts with government agencies like the Defense Advanced Research Projects Agency, or DARPA, at the Pentagon.” Now, Brooks has started a new company, Rethink Robotics, backed by venture capitalists. According to an [interview](https://edtechbooks.org/-cvL) [https://edtechbooks.org/-cvL] with Brooks, “Baxter was developed at a VC backed company, Rethink Robotics. So there is no funding to receive from governments or funding agencies. In the past the pre-research for the technologies that went into Baxter have been funded by the US government, via NASA and DARPA.”



[\[https://edtechbooks.org/-jLD\]](https://edtechbooks.org/-jLD)

Josephs and Keynes predicted shared prosperity from the rise

of automation. They did not foresee such a massive welfare program designed to help corporations.

We must not confuse the hope that Josephs and Keynes shared with Thomas Friedman's [facile claim](https://edtechbooks.org/-pfnG) that "America, as a whole, will do fine in a flat world with free trade" because "there is no limit to the number of idea-generating jobs in the world." So-called 'knowledge work' depends on [sacrificial people toiling in sacrificial places](https://edtechbooks.org/CtH) [https://edtechbooks.org/CtH], doing the dangerous and dirty work we still rely on. Writing in 2003, [Doug Henwood](https://edtechbooks.org-cZi) [https://edtechbooks.org-cZi] asks: "We've been hearing about post-industrial society for at least thirty years; if it had come about, would we have to worry about global warming?"

Yet, because 'thought leaders' follow Friedman, they conclude that schools must work to provide the kind of skills that will allow individuals to create their own knowledge work. In [The Sociological Imagination](https://edtechbooks.org-Ljx) [https://edtechbooks.org-Ljx] (1959), C. Wright Mills already observed a shift taking place where public issues were being blamed on personal troubles that "occur within the character of the individual". So we should not be surprised when Thomas Friedman interviews Tony Wagner – an education 'thought leader', friend of Friedman, and advocate of the skills agenda – and suggests that [people who need jobs should invent them.](https://edtechbooks.org-iMv) [https://edtechbooks.org-iMv] Wagner tells Friedman that "Young people who are intrinsically motivated – curious, persistent, and willing to take risks – will learn new knowledge and skills continuously. They will be able to find new opportunities or create their own – a disposition that will be increasingly important as many traditional careers disappear."

In contrast, Josephs was still able to believe in a collective responsibility, writing that “the price tag on this [coming economic] abundance is the responsibility of society for the welfare of the individuals who are, from time to time, dislocated.”⁷ *Emerging Scene*, p. 25

Instead of factoids without substance, we actually have good statistical projections about the future of jobs, and it’s bleak. A look into the future of paid work shows persistent gaps and cracks rather than a ‘flat’ world. The [Bureau of Labor Statistics \[https://edtechbooks.org/-GpI\]](https://edtechbooks.org/-GpI)’ projections for numeric job growth from 2014-2024 indicate that four out of the top five growing jobs pay salaries that are less than \$21,400 per annum. With the exception of Registered Nurses (#2), who on average earn \$66,640 and require a Bachelor Degree, the other top five growing jobs require no formal credentials.⁸ I borrow this paragraph from my [essay here \[https://edtechbooks.org/-pDd\]](https://edtechbooks.org/-pDd).

Beyond Press Releases

[Audrey Watters \[https://edtechbooks.org/-pdXB\]](https://edtechbooks.org/-pdXB) has written about how futurists and gurus have figured out that “The best way to invent the future is to issue a press release.” Proponents of the ‘skills agenda’ like the OECD have essentially figured out how to make “the political more pedagogical”, to borrow a phrase from [Henry Giroux. \[https://edtechbooks.org/-Rcm\]](https://edtechbooks.org/-Rcm)In their [book \[https://edtechbooks.org/-bCmr\]](https://edtechbooks.org/-bCmr), *Most Likely to Succeed*, Tony Wagner and billionaire Ted Dintersmith warn us that “if you can’t invent (and reinvent) your own job and distinctive competencies, you risk chronic underemployment.” Their [movie \[http://www.mltsfilm.org/\]](http://www.mltsfilm.org/), of the same title,

repeats the hollow claim about ‘jobs that haven’t been invented yet’. Ironically, though Wagner tells us that “knowledge today is a free commodity”, you can only see the film in private screenings.

I don’t want to idealize Josephs, but revisiting his context helps us understand something about the debate about education and the future, not because he was a radical in his times, but because our times are radical.

In an interview at [CUNY \[https://edtechbooks.org/-CZn\]](https://edtechbooks.org/-CZn) (2015), Gillian Tett asks Jeffrey Sachs and Paul Krugman what policy initiatives they would propose to deal with globalization, technology, and inequality.⁹This part of their conversation starts at about 32:00 After Sachs and Krugman propose regulating finance, expanding aid to disadvantaged children, creating a robust social safety net, reforming the tax system to eliminate privilege for the 0.1%, redistributing profits, raising wages, and strengthening the position of labor, Tett recounts a story:

“Back in January I actually moderated quite a similar event in Davos with a group of CEOs and general luminaries very much not just the 1% but probably the 0.1% and I asked them the same question. And what they came back with was education, education, and a bit of digital inclusion.”

Krugman, slightly lost for words, replies: “Arguing that

education is the thing is ... Gosh... That's so 1990s... even then it wasn't really true."

For CEOs and futurists who say that disruption is the answer to practically everything, arguing that the answer lies in education and skills is actually the least disruptive response to the problems we face. Krugman argues that education emerges as the popular answer because "It's not intrusive. It doesn't require that we have higher taxes. It doesn't require that CEOs have to deal with unions again." Sachs adds, "Obviously, it's the easy answer for that group [the 0.1%]."

The kind of complex thinking we deserve about education won't come in factoids or bullet-point lists of skills of the future. In fact, that kind of complex thinking is already out there, waiting.

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