

Only for those who think by *Igor Yudovich*:



DEGRADATION STARTS WITH EDUCATION

As a former American and Israeli professor, I would like to comment. Just as there is nothing wrong with the Chinese building Israeli tunnels, there is nothing wrong with the constant import of brains from Asia. It is ridiculous to compare the quality of teaching and the level of students at Stanford University and Tel Aviv University. It is enough to compare the first degree exams of students, which I did when I was teaching in Tel Aviv. Of course, most universities in America do not teach anything at all. It's just a separate business that aims to take money from parents for a 4-year pastime of children. The entire education system is investing in the marketing of studies and has created an atmosphere in America that everyone needs education - 40% of school graduates receive some kind of university degree. There is nothing wrong with that - this is the same service as a manicure or a movie - an occupation for the giver and the recipient of the service. There are enough scientists and engineers trained by the best universities. Software,

electronics, robots are made in America. Israel's production is 1.5% of the world's high-tech (a success for a country with 0.1% of the world's population), but it's not for us to tell America about the quality of education.

I first became acquainted with the American education system in the late 70s of the last century, when I roamed with my professor Karlin as part of my doctorate between the Weizmann Institute in Rehovot and Stanford University in Palo Alto. Stanford, then and now, consistently ranked among the top three universities in America (and the whole world).

Even then, it was clear that the system of school training had collapsed completely, and education in colleges and universities was falling apart degree after degree before my very eyes. In particular, in Palo Alto (a campus with about 20 thousand university teachers and centers of some of the most advanced companies in the United States) there were only a few small classes in which mathematics were still taught, and a physicist friend of mine (an Israeli) complained that he did not find a single schools within a radius of 20 miles (he did not look further) in which physics would be taught (for his children).

In the Stanford Mathematics Entrance Exam, there was a problem: 2 cakes were cut into 8 pieces each and divided equally among 4 students. How many chunks did each student get?

After only 30% of the applicants solved this problem, they decided to simplify it. The new version for the next year sounded like this: 2 pizzas were cut into 4 parts each and divided equally between 4 students. How many chunks did each student get?

This option was decided by 25% of applicants (the year was the following). After that, the mathematics exam for the faculties of mathematics and physics was canceled.

At that time, there were no computer departments, and the whole of Silicon Valley came out of several computer projects at the Mathematics Department at Stanford.

Another story a few years later. One of my fellow practitioners, after completing his doctorate, went to the States for a postdoctorate. He was admitted to one of the leading universities in Texas. In the first year there are several hundred students, only one of them taught some kind of arithmetic at school. For the first exam, my friend gave the students in advance all the questions that would be on the exam and explained all the solutions. As a result, only a few students received a satisfactory grade, the rest failed miserably. The dean called my friend and asked him why he was so unhappy and why he decided to leave the university right after the first semester. Volodya said that he was satisfied with everything and was not going to go anywhere. And at whose expense I will pay your salary, the dean asked, you have just overwhelmed all the students of my faculty.

Volodya immediately corrected everyone's grades and everyone continued to study together and successfully received a bachelor's degree.

But then there was a serious selection for the master's degree (although it was mostly foreigners), and the doctorate there is still one of the best in the world. Here are just native Americans (of those who have the right to become US presidents) among them there are practically no.

And it is enough to look at the photographs of the US national teams at international Olympiads - there are practically only Asians there, even the Jews are no longer there, but they held out for some time.

So it goes.

Elik

What's behind the facade?

So, we have about 4 thousand universities, but we cannot do without hundreds of thousands of foreigners ... We have strategic industries that have been outsourced abroad. We have bureaucrats known for their shameless waste of taxpayer money. We have what we have been going for a long time. We got it. We have. Although, of course, Trump is to blame for everything.

We drove, drove ...

I am sorry, there will be many numbers.

First, about the problem as if not related to the topic.

A friend who occupies a very solid level in one giant company in Silicon Valley told me something like this for days: "Igor, you have little idea of the number one problem in the Valley and what everyone is talking about now. And everyone says, as the greatest problem, Trump's ban on hiring new I-Tishniks from China and India. And that those hundreds of thousands of Chinese and especially Indians who are already working in the Valley are mortally afraid to go "home" on vacation. They are afraid that they will not be allowed back. They sit on suitcases, many already have tickets, and do not know what to do. "

After the conversation, I had questions.

There are approximately 3,700+ universities in the US. Of course, I do not have exact information, but I think that half of them have some analogs of the departments of mathematics, physics and - especially - computer science. These universities graduate computer specialists annually in very large numbers. Which is not surprising, and according to the laws of capitalism, this is how it should be: the salaries of Ai-Tishnikov today easily beat everyone else - the average in the Valley is about 100 thousand. This is together with secretaries and floor polishers. Why should we hire Chinese and Indians in such numbers? We are not talking about geniuses and half-geniuses. No, from the experience of my work in a large corporation, I saw that the human material of programmers and other IT (high-tech) specialists from India (and in our corporation on some floors they are not Indians - a statistical trifle) is no different from the average.

There is no one, all explanatory answer. But there are options. There are two of my friends who offer their own answer. Both are Russian émigrés from Leningrad. They arrived at the age of 40 and 30, respectively. One became a serious NASA specialist, one of the managers of the Lunar program, in general - a man with a famous name, even spoke on SNN after water was found on the Moon. Another, having completed a series of large (especially for an emigrant) positions (for example, the chief engineer of an analogue of Vodokanalrest in a district with 2 million inhabitants) founded an engineering company, where she currently employs from 25 to 30 engineers. To my question, "why do they keep complaining that they can't hire the right engineers?" both answered roughly the same: "Because universities graduate boobies." I agree that their expectations are significantly overestimated. Perhaps, because of their own extraordinary abilities, success and character traits. But I myself have seen something similar with my own eyes all my American life.

Do not immediately blame me for all sins. Of course, there are many smart and talented graduates. Of course, we can all tell about our children, grandchildren and colleagues, but in the second part of my story I will try to confirm my fabrications with some facts.

But first - about our universities and about the problems in them and with them.

There are two main types of universities in the United States: private and the so-called public. Among the best are the overwhelming majority of private ones (in the top twenty, as a rule, all

are private). State-owned - mostly full-time, that is, under the financial roof and regulations of the full-time bosses.

Again, I will refer to the opinion of my friend, this time a university teacher. Here is his opinion, the opinion of a professor of mathematics at a state university in our state (California):

“In the early 90s, each group had 3-4 people, mostly Jews, with whom it was possible to work, who came prepared and who wanted to learn something. Ten years later, there were 3-4 people in each group, mostly Chinese, who ... and so on. There is no one left today. The level of preparation for admission at the level of a C grade student of the 10th grade of the Soviet school. " Yes, this is not the most outstanding university, but it is a huge state university (30 thousand students) in a big city of the most monetary state in the country. Yes, in Berkeley - also a regular one, for sure things are better. But the bulk of American universities are infinitely far from Berkeley. The state system of California universities has 23+ universities - 482 thousand students (the system to which Berkeley belongs, the UC system, another, but also full-time, there are 10.5 universities). Half a million students in just one public university system in one state. Add 285k from the UC system, to which Berkeley belongs. Add at least 250 thousand from the many private ones. In total, in a state with a population of less than 40 million people, one million study at universities, every 40th. Every year, universities in one state alone graduate about 200 thousand people. Specialists! Specialists?

Or are universities just a tool to siphon money out of, and profit for?

After all, if universities graduated specialists, then how could the following be explained:

71% of high-tech workers at Silicon Valley were overseas-born;

63% of high-tech workers in Seattle, a very large computer technology center (I have no data on SV), are not American citizens, mostly H-1B visa holders.

How does a great American university education fit into this data? Why do companies favor foreigners when comparing their native American average to a university degree? At the same time, companies incur additional costs for obtaining and maintaining a visa (approximately 10-11 thousand dollars per person). I hope readers understand that we are talking about American companies on American soil, where engineers of the same level of professionalism from India and Indiana sitting next to each other receive the same salary.

By the way and in passing, what about the price of this American education?

I worked in a huge (27 thousand people) old (from the middle of the 19th century) corporation even at a time when it was not led by nomenclature aliens as it is today, but traditionally from their own lower classes. Although it has nothing to do with the topic, but among other things, it meant human relations between the top and bottom. Every year, all employees of the company underwent several 2-5 day "refresher courses" at the training center of the company in a neighboring town. Once during such a study and during a lunch break, the head of the company, CEO, Gordon Smith, sat down at our table of 10-12 employees of the department. We talked about this and that (some "senior" comrades remembered him, and he remembered them from ancient times), and Gordon said that he started working in the company (where his father already worked as an engineer) from that every time during his student holidays for two months he dug holes for electric poles. And then he said an absolutely fantastic phrase: "The earnings were just enough to pay for the annual tuition at Berkeley."

Something completely ugly has happened to the cost of training since then. Data from WIKI (College tuition in the US).

1980-2015 years:

Cost of living increased by 120%

The cost of just paying to universities, what is called tuition (there are many additional payments) is 260%.

The same for 1978-2008, but taking into account ALL education costs:

330%.

960%.

That is, the cost of a university education has grown three times faster than the cost of living.

Well, now about the quality of education and the consequences of outsourcing.

The scandal with Boeing planes, which "designed the clowns and directed the monkey project" is known to everyone today. The scandal with the Boeing space program (with taxpayers' money - this is a government contract) is flaring up only now, but it is even more serious.

Littoral combat ship (LCS) - "revolutionary" program of the Ministry of the Fleet, conceived as the construction of 55 ships of a new type in the 1990s, and scandalously failed after the construction of 15+ unnecessary to anyone - the history among military specialists is quite well-known. The program was attended by the really best military corporations of today with very big names and with outstanding specialists. The problem, however, is not only bad ideas when creating, not only inadequate thinking of the bureaucrats of the ministry and industry, not only in surprisingly careless design, but also in the fact that after all mental and non-mental delays and budget overruns, rarely any of the ships from those in the service of the Navy gets to the home port on its own.

But these are still flowers.

In May 2017, the US Navy officially handed over the new and the latest in ideas and capabilities, the aircraft carrier Gerald Ford (100,000 tonnes of payload, 337 m long, 78 m high). Officially, it is believed that the transfer took place only 18 months after the appointed date and it cost only 2.5 billion more than the project budget (12.99 instead of 10.5). Today we have July 2020, three years have passed since the ship was handed over to the military. What do we have? "Excessive consumption, no matter how great it is, in itself does not mean anything. The ship has not yet received the necessary certificates of validity due to numerous fundamental problems with turbo generators, an electromagnetic aircraft launch system, an aircraft braking-stopping system, elevators for lifting planes from the hangar and lifting weapons (only 5 of 11 elevators were able to start) ... For an attempt to debug non-working equipment, the Navy pays from the operating budget, which should have been spent on the actual operation of this expensive toy. Today, the Navy believes that they will be able to bring the aircraft carrier "to work" in the ocean in 2022, but experts do not believe in this, since critical tests at "shock trials" are still ahead, and everything indicates that the electromagnetic systems for launching aircraft are not. will stand ". But these are all "little things" in comparison with the real problem.



The essence of an aircraft carrier is to carry aircraft. It's even easier: to bring planes as close to the battlefield as possible, so that the planes can effectively work out their targets on the battlefield. Since aircraft have a certain known flight range to perform a combat mission, the aircraft carrier must be in such a zone for a more or less long time, at such a distance from the coast of the alleged enemy, so that aircraft with cargo could take off, do their job, return back, refuel, reload weapons (missiles, bombs) and fly away again to carry out your combat mission. Much of the most expensive military program in human history - the creation and production of F-35 aircraft - was conceived specifically for aircraft carriers. Under the characteristics of the naval F-35C, the aircraft carrier should be located in the region of 500 miles from the coast of the alleged enemy.

The supposed enemy for the US Navy today is only one - China. So, none of the American aircraft carriers today can be relatively safe at such a distance from the coast of China. It is so unsafe that the issue is not even discussed. Over the past 20 years, China has created an effective weapon to "drive away" aircraft carriers, so the real, more or less safe distance today is 1000 miles. Today, Americans have no protection against the Chinese DF-21 and DF-26 anti-ship missiles. That makes the multi-billion dollar F-35C program in fact wasted money (there is an option to refuel the F-35C FA-18E / F aircraft in the air, but it is not considered seriously due to the vulnerability of slow-flying tankers with a huge radar notch). The naval authorities today were forced to leave "control" over the seas for the aircraft carriers, and thanks for that.

Let's forget for a moment all the problems described and accept for a moment that everything on the ship is designed and works wonderfully. Why, however, is the aircraft carrier Gerald Ford so expensive? There are many reasons here too. To begin with, in the United States, in its civilian economy, there is not a single rolling mill left capable of producing steel of the required quality for the hull of a modern large warship. They still exist in the military industry. But the outsourcing of the design and construction of new mills by America back in the 90s, naturally, left the country without specialists. Still, it must be admitted that designing a mill for rolling high-strength steel up to 100 mm thick (and for submarines even thicker, and moreover titanium) is a little more difficult than writing an application for the iPhone. You cannot prepare such specialists in a day and in a year. Breaking - not building: the schools of specialists have been destroyed and they probably cannot be restored. Steel, however, comes from somewhere. Yes, it is imported to the USA from China, Taiwan, Europe, possibly from Tmutarakan. It is still made at military enterprises ... but without competition, without new technologies, it turns out to be expensive on old equipment. But this is not a problem - after all, the taxpayer has become very rich on cheap Chinese shirts and Vietnamese slippers, he will pay.

Another thing is worse. When designing an aircraft carrier, the developers and the navy faced a fundamental question: should they be built on nuclear reactors or on traditional thermal (oil) boilers? For dozens of serious, objective reasons, the Navy insisted on traditional, much cheaper and more reliable production and operation. However ... However, it turned out, and I want to write - it is unexpected that in the country the United States of America no longer designs and does not build such boilers. Well, absolutely. Well, with all the desire, there is nowhere to take. And also, again unexpectedly, they do not design or build high-pressure ship turbines. Which have been building for almost a century better than in any other country in the world. It turned out, again unexpectedly, that they, too, had been outsourced.

At this point in the story, I remembered about the domestic big power industry. The one on which, unlike the sun, wind and cow shit, the American economy rests. The same one, which consists of large thermal power plants with very large turbines, generators, boilers and transformers as high as a three-story building. And I remembered that the designers of new stations - as always unexpectedly - learned that, for example, transformers with a height of even a two-story house are no longer being designed and produced in the USA. And what if someone comes up with the idea of building a large power plant, then you have to get on the line, for 6-8 years, until such a transformer is built for you in Taiwan or France. If they want to. Or they may not want to, they themselves do not have enough. China will think it over, most likely it won't. So two expensive nuclear reactors had to be installed on the aircraft carrier, which means that everything that protects them atomic stuffing has to be increased, including from all kinds of military flying and floating pieces of iron. And with these nuclear reactors and protection, the aircraft carrier automatically moved another 200 miles from the coast of our main outsourcing partner.



So, we have about 4 thousand universities, but we are hiring and cannot do without hundreds of thousands of foreigners, including “specialists” from the country of the supposed main military enemy. We have our own specialists, graduates of our universities (non-citizens do not work in the military industry), who are known for their mediocre design and inability to look a step ahead. We have strategic industries that have been outsourced abroad, including to the country of the supposed military enemy number one. We have bureaucrats who are best known for shamelessly spending taxpayer money.

In general, we have what we have been going for a long time. We got it. We have.

Although, of course, Trump is to blame for everything.

(Based on materials from the American press)

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