

Edge Question 2009

What Will Change Everything?

Haim Harari

At Last: Technology Will Change Education

Sometimes you make predictions. Sometimes you have wishful thinking. It is a pleasure to indulge in both, by discussing one and the same development which will change the world.

Today's world, its economy, industry, environment, agriculture, energy, health, food, military power, communications, you name it, are all driven by knowledge. The only way to fight poverty, hunger, diseases, natural catastrophes, terrorism, war, and all other evil, is the creation and dissemination of knowledge, i.e. research and education.

Of the six billion people on our planet, at least four billions are not participating in the knowledge revolution. Hundreds of millions are born to illiterate mothers, never drink clean water, have no medical care and never use a phone.

The "buzz words" of distant learning, individualized learning, and all other technology-driven changes in education, remain largely on paper, far from becoming a daily reality in the majority of the world's schools. The hope that affluent areas will provide remote access good education to others has not materialized. The ideas of bringing all of science, art, music and culture to every corner of the world and the creation of schools designed differently, based on individual and group learning, team work, simulations and special aids to special needs—all of these technology enabled goals remain largely unfulfilled.

It is amazing that, after decades of predictions and projections, education, all around the world, has changed so little. Thirty years ago, pundits talked about the thoroughly computerized school. Many had fantasies regarding an entirely different structure of learning, remote from the standard traditional school-class-teacher complex, which has hardly changed in the last century.

It is even more remarkable that no one has made real significant money on applying the information revolution to education. With a captive consumer audience of all school children and teachers in the world, one would think that the money made by

eBay, Amazon, Google and Facebook might be dwarfed by the profits of a very clever revolutionary idea regarding education. Yet, no education oriented company is found among the ranks of the web-billionaires.

How come the richest person on the globe is not someone who had a brilliant idea about using technology for bringing education to the billions of school children of the world? I do not know the complete answer to this question. A possible guess is that in other fields you can have "quickies" but not in education. The time scale of education is decades, not quarters. Another possible guess is that, in education, you must mix the energy and creativity of the young with the wisdom and experience of the older, while in other areas, the young can do it fast and without the baggage of the earlier generations.

I am not necessarily bemoaning the fact that no one got into the list of richest people in the world by reforming education. But I do regret that no "game-changing" event has taken place on this front, by exploiting what modern technology is offering.

Four million Singapore citizens have a larger absolute GDP than 130 million Pakistanis. This is not unrelated to all the miseries and problems of Pakistan, from poverty to terror to severe earthquake damage. The only way to change this, in the long run, is education. Nothing better can happen to the world, than better education to such a country. But, relying only on local efforts may take centuries. On the other hand, if Al Qaida can reach other continents from Pakistan by using the web, why can't the world help educate 130 million Pakistanis using better methods?

So, my game-changing hope and prediction is that, finally, something significant will change on this front. The time is ripe. A few novel ideas, aided by technologies that did not exist until recently, and based on humanistic values, on compassion and on true desire to extend help to the uneducated majority of the earth population, can do the trick.

Am I naive, stupid or both? Why do I think that this miracle, predicted for 30 years by many, and impatiently waited for by more, will finally happen in the coming decades?

Here are my clues:

First, a technology-driven globalization is forcing us to see, to recognize and to fear the enormous knowledge gaps between different parts of the world and between segments of society within our countries. It is a major threat to everything that the world has achieved in the last 100 years, including democracy itself. Identifying the problem is an important part of the solution.

Second, the speed and price of data transmission, the advances in software systems, the feasibility of remote video interactions, the price reduction of computers, fancy screens and other gadgets, finally begin to lead to the realization that special tailor-made devices for schools and education are worth designing and producing. Until now, most school computers were business computers used at school and very few special tools were developed exclusively for education. This is beginning to change.

Third, for the first time, the generation that grew up with a computer at home is reaching the teacher ranks. The main obstacle of most education reforms has always been the training of the teachers. This should be much easier now. Just remember the first generation of Americans who grew up in a car-owning family. It makes a significant difference.

Fourth, the web-based social networks in which the children now participate pose a new challenge. The educational system must join them, because it cannot fight them. So the question is not any more: "Will there be a revolution in education?" But "Will the revolution be positive or deadly?" Too many revolutions in history have led to more pain and death than to progress. We must get this one right.

Fifth, a child who comes to school with a 3G phone, iPod or whatever, sending messages to his mother's blackberry and knowing in real time what is happening in the class room of his brother or friend miles or continents away, cannot be taught anything in the same way that I was taught. Has anyone seen lately a slide rule? A logarithmic table? A volume of Pedia other than Wiki?

At this point I could produce long lists of specific ideas which one may try or of small steps which have already been taken, somewhere in the world. But that is a matter for long essays or for a book, not for a short comment. It is unlikely that one or three or ten such ideas will do the job. It will have to be an evolutionary process of many innovations, trial and error, self adjustment, avoiding repetition of past mistakes and, above all, patience. It will also have to include one or more big game-changing elements of the order of magnitude of the influence of Google.

This is a change that will create a livable world for the next generations, both in affluent societies and, especially, in the developing or not-even-yet-developing parts of the world. Its time has definitely come. It will happen and it will, indeed, change everything.