

Predicting the Unpredictable: Skills for the 21st Century

Remarks by USCIB President and CEO Peter Robinson
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Thank you, Blaise [*Moderator Blaise Matthey, Director-General, Business Federation of Western Switzerland—FER*].

Listening to my distinguished colleagues on this panel, I am once again struck by the depth of expertise in the IOE's worldwide network. This demonstrates the importance, now more than ever, of bringing business expertise to the table in high-level discussions of how we can build more dynamic and resilient societies around the world.

My role today is to take a look into the future, to see how we might anticipate the challenges that employers, and individuals, will face in the years ahead as the result of rapid changes in technology. I'd like to talk about the proliferation of new technologies that have the potential to transform, and in some cases replace, human tasks. I'll also look at ways we might adapt in a world of increasingly rapid technological change, and propose some ways we can work together to make this happen.

I am drawing largely on research supported by USCIB's educational foundation over the past few years. We have convened several workshops of leading academics, education experts, futurists and business planners, to discuss 21st-century education and human capital requirements, and the impact of new technologies on the workplace.

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Let me put it plainly: I believe we have entered an era where the pace of technological change is accelerating faster than our societies can adapt under present conditions. We therefore must urgently address deficiencies in our education and workforce training systems.

Here are three examples of disruptive technologies that are already making their presence felt:



SLIDE 1

First, 3-D printing. On the left is of a chain of women's shoes that were produced using a 3-D printer. Right now the technology is being used to produce mainly one-off plastic items and components like these. But 3-D printers are also increasingly being used to produce custom foodstuffs, like the custom-made chocolate on the right, produced by Hershey's. They are beginning to crank out custom electronics, toys, aircraft and auto parts, and even weapons and other military components.

This technology will be a big boon to entrepreneurs and smaller producers, for creative professionals like architects and designers, and for many consumers as well. But what will it mean for workers in machine shops, food processing and the like? We can only imagine.



SLIDE 2

Second, driverless automobiles. To date, Google's autonomous vehicles have test-driven over a million kilometers with only two minor accidents. It's pretty clear that this technology will be commercialized within the next decade. In the United States, the majority of vehicles on the road are expected to be autonomous by the middle of this century. Autonomous airplanes are also on the drawing board.

Quite apart from the impact on consumers, what will this technology mean for taxicab drivers, truck drivers and airline pilots, to take just a few examples?



SLIDE 3

Third, artificial intelligence: IBM's Watson computer has defeated Gary Kasparov at chess, and demolished its competition on the quiz show "Jeopardy." With so much of the world's information being digitized, and with the cost of storing and processing that information falling rapidly, artificial intelligence will become even more pervasive in everyday life.

The likely impact is far-reaching. According to an Oxford University study, occupations employing about half of today's workers in the United States – from loan officers to lab technicians, from real estate agents to prison guards – may become subject to automation in the next 10-20 years as a result of advances in artificial intelligence and robotics.

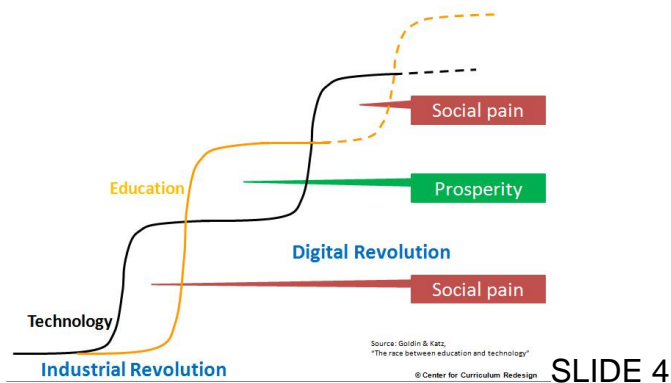
These are just the tip of the iceberg. Technology is evolving so rapidly that, in many instances, by the time we as individuals have adapted, it has leapfrogged once again. Just think of your mobile phone or your home computer. If it's that difficult for individuals to adapt, how can societies ever hope to stay ahead of the technological curve?

Some futurists even predict that, in the not-too-distant future, machines may become self-improving. That is, a machine might invent, develop and deploy its own improvements – or improvements to human life – faster than humans can, accelerating the pace of innovation even more. What this might mean for our societies is positively mind-boggling.

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But while today's pace of change may be unprecedented, we have been down this road before.

Technology and education are in a race



This slide, which was developed by Charles Fadel of the Center for Curriculum Redesign for one of our workshops, shows how technology has raced ahead of our educational systems in two previous occurrences: the industrial revolution and more recently the digital revolution.

In each case, it has taken many years for our educational systems to catch up with the demands of a changing workplace. During those years, there was a great deal of “social pain” as people struggled to adapt. Once they had adapted, it ushered in a period of prosperity. For many Western societies this was the period after World War Two.

Now we find ourselves in the second era of social pain, as people try to adapt to a time of rapidly advancing digital technology and globalization. The question remains: Can we truly “turn the corner” of that yellow line, to get us back to a period of sustained prosperity? And what happens if that black line races so far ahead that our education and training systems can never catch up?

What is clear is that the old ways won’t work anymore. Machines are increasingly going to perform important parts of even the most cognitively demanding jobs. But this means that certain human character traits will be increasingly required to succeed in the workplace. These include curiosity, enthusiasm, a strategic mindset and the ability to construct systems that leverage the vast computational power our machines will possess—in essence, the key components of creativity in today’s world.

What won’t be as valuable – particularly at the university level – is rote learning, memorization and the ability to take tests. So we need our schools to instill these critical character traits in addition to teaching to a test.

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This brings me to my final point, which is the importance of working together to address the workplace challenges of the 21st century. Employers, governments, workers and civil society must all cooperate to transform our educational and workforce training systems:

As repetitive jobs like fast-food work, or even legal drafting and editing, become increasingly automated, we need a complete rethinking and overhaul of often outmoded school curriculums. We need to replace obsolete topics of study with a new focus on development of critical thinking skills and character traits like inquisitiveness and persistence.

We need to improve connection between school-based learning and work-based training, with more sensible and coherent apprenticeship and internship programs—the IOE/BIAC Global Apprenticeships Network (GAN) is a solid initiative in this regard. We need to rethink the front-end-loading of education and develop systems for lifelong learning. And we must develop better training programs within companies so that workers can learn not just for their current job but the jobs of the future.

Businesses also have a more proactive role to play in helping universities figure out what studies would be best to prepare students for the their specific workplace needs, and to secure appropriate business certificates for students without a business major. With business generating much of the innovation driving the growth in technology, a more symbiotic relationship between academic institutions and the private sector in terms of curriculum development will help in closing the technology/education gap by bringing education and skills in line with technology advances.

We also need governments and the private sector to work together to provide the kind of robust infrastructure needed to access the transformational power of the Internet and other technologies. I think that Colombia, which is working hard to upgrade its citizens' access to the Internet through an ambitious broadband infrastructure rollout program, provides a good model in this regard.

We should also be marshalling the power of “big data” to help us track trends and make informed predictions about the jobs of the future. Skill sets needed by major employers could be collected in databases and analyzed as skill sets change over time. Business is already taking the lead in areas like urban planning and administration, and it is in the private sector's interest to develop robust and responsive education and training systems. We need to extend big data into skills training.

I am convinced that, working together, we can stay ahead of the technological curve, and master it before it masters us. Going back to the topic I was asked to address, we cannot “predict the unpredictable.” But we can predict one thing: the pace of change is accelerating, and it will only get faster. So we need to prepare ourselves as best we can, working together to help determine what people need to learn for the 21st-century workplace. And we need to get started right now.

Thank you.