Teaching, digitally disrupted

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mini-keynote

Look at human beings. First from some distance. They can walk, lift things and move them around. Locomotion and physical work. These got first externalized by, or rather outsourced to animals. Then, inanimate processes took over. The steam engine changed what people did and how they did it, reshaped the landscape.

The recipe is clear: take some ability of humans and try to externalize it in order to get rid off its physiological and evolutionary constraints. Then expect rapid change beyond imagination.

Look at humans again. Now get closer, so it becomes clear that they can talk, remember and think. Apply the recipe again: externalize our thinking. *What is digital?* A simple idea: everything we can talk about (maybe everything we feel) can be represented as numbers, most notable by zeroes and ones, by the binary digits. Then the digital information can be transformed, analyzed, summarized by dumb physical processes, e.g. searching in a database done by shepherding electrons through a maze of nanoscale wires and gates.

Compare the relative importance of muscles and the brain in the human body and estimate the difference between the steam engine and the computing engines of ideas. Recording facts had long been outsourced to books, but now we are offloading thinking processes as well (e.g. using a map versus following instructions from a satnav). How much are we gaining and how much are we loosing? We need to think and – somewhat paradoxically – we need to employ more thinking power in order to understand our future.

One could easily antagonize technology and education by saying that the technology tries get things out of our heads while education tries to put them into.

To put it bluntly, teaching is sharing information, and more importantly, sharing ways of information processing. *Can we just continue with how we teach now?* No. Students in the classroom have an increasingly different perception of the world. *Can we throw away everything?* No. The challenges we face are formidable. Thinking that we can tackle them without the accumulated knowledge and wisdom we have is delusive.

One thing is clear though. Teaching without research is not possible any more. There is no codified, static body of knowledge to be presented repeatedly. Even our understanding of the past is constantly changing, even mathematics is being transformed. Borrowing terminology from software industry, courses need to be fast moving, rapidly deployed with continuous integration.

So, what shall we teach? How shall we teach? Well, this is the challenge here for you.