

# **“A machine should be like a personal trainer for learners”**

Interview by [Sabine Gysi](#)  
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*Edy Portmann explains why it is important for schools to reinforce the scientist that lies within every child. He talks about intelligent learning systems and how they can be used to build collective intelligence, as well as to encourage students' creativity and help them learn to work together to solve problems.*

*Sabine Gysi: In discussions of the digital transformation in education, skeptics often complain that reality is being pushed aside in favor of the digital. Does it make sense to look at the “real” world and the digital world as opposites?*

Edy Portmann: I've heard some teachers say that technological tools are “artificial.” But I don't think this duality exists. As a computer scientist, I know that all of these tools are developed by human beings. A symbiotic relationship between humans and technology has existed since ancient times. What we are seeing today is simply the logical continuation of a process that has gone on for thousands of years – perhaps starting when our ancestors first discovered that they could use sticks to pull down fruit from a tree.

And now, as this symbiotic relationship continues, it's important to avoid framing it as a competition between humans and machines; this also applies to education and the schools. Obviously, machines are much better at certain things – grouping numbers, for example. But this doesn't mean that there is no longer a role for human skills. Instead, technological tools should help us develop typically human strengths, such as creativity, to an even greater extent.

## **“With all of the changes that are taking place, schools need to permit more experimentation and find ways to reinforce the scientist that lies within every child.”**

With all of the changes that are taking place, schools need to permit more experimentation and find ways to reinforce the scientist that lies within every child. Until the time of school entry, children behave like scientists. Once they are in school, however, it is unfortunately all too common for them to be subjected to quasi-military drills; the scientist within them is snuffed out. The opposite approach would be much more helpful!

*SG: Does that mean that teachers should be much less concerned with the “right” and “wrong” ways of solving a problem?*

EP: (laughs) If you take away teachers' methods of solving problems, they'd be at loss. But there's no single right way, and the world's problems are becoming increasingly complex – they're "wicked problems," as they're called in the field of design thinking. It's therefore important to let students work together to find a solution, or maybe 100 different solutions; then a decision can be made as to which ones are better, and why. In short, a design science mindset is important in approaching and solving problems.

SG: *From what you said earlier, I gather the symbiotic relationship between humans and technology generates a kind of collective intelligence. How can schools adopt this notion, which is in stark contrast to the traditional emphasis on individual achievement?*

EP: It is no longer helpful to be constantly focusing on standardization and comparing the performance of individuals; it seems to me that many schools recognized that long ago. It clearly makes no sense to ask who can reach the top of a tree as quickly as possible, and then compare the performance of an elephant, a fish, and a bird.

Obviously, there's nothing wrong with continuing to insist on achievement. But we need to focus on the progress *each individual* has made, relative to past performance. And this is precisely the role of tools that help individuals improve and experience learning in a positive way, taking advantage of collective intelligence, while at the same time enabling them to assist others in their progress. The schools that are working with teachers and students to develop a kind of "smarter" Wikipedia – namely, one that helps building collective intelligence – understand this.

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People in the business world would say that we need new key performance indicators (KPIs). The ones we have today are not capable of preparing people for a new kind of society. It's almost as if schools were still training children for work on an assembly line, in keeping with the principles of Taylorism. A bell rings, and math class begins; another bell sounds and it's time for German – and on and on. It's like a factory. But those kinds of jobs will be less and less common in the future. Instead, there will be a growing majority of creative and adaptable workers, people who are able to (and must) constantly develop their skills.

I believe, therefore, that if we want to compare individual performance, we need to find ways to measure creativity and crafting. I don't have the solution. All of us who are devoted to shaping the school system for the future must tackle that question together.

SG: *How can technology – intelligent learning systems, for example – be integrated into our schools?*

EP: A machine should be like a personal trainer that helps learners make progress. It would obviously be the wrong approach to turn every student into a programmer, for instance; that would be like insisting that everyone become a mathematician. We will shape the world of tomorrow by taking the many different skills that children are learning today and putting them together, like the pieces of a jigsaw puzzle. Only by looking at the world from a wide variety of perspectives will we find the solutions we need for the future. This means using technology in a way that supports students, teachers and parents – a win-win-win situation.

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To foster the appropriate mindset, we need to encourage students themselves to develop and improve technologies. To do so, they need to understand the basics of computational thinking. Students and teachers should be constantly asking themselves: How can I use technology to help me achieve my objective?

SG: *Curiosity and creativity seem to play an important role in this mindset.*

EP: While working on a task, students may suddenly realize that they need to know more about a certain subject. And then they will seek that knowledge without being forced to do so, simply out of curiosity. Schools should do much more to encourage their curiosity. Isn't it distressing that children have to study incessantly while they are in school, and are expected to be creative only after entering the workforce? By that point their creativity has long since been snuffed out.

Technology should also serve as a tool for finding creative solutions. Instead of “artificial intelligence,” I prefer to talk about “intelligence amplification.” An intelligent learning system can recognize, for example, which students have the skill sets that best complement each other, and then suggest that they work together on a project.

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Technology also produces enormous quantities of data. Thus considerably more effort should be put into making sure that students know how to work with data. This means focusing not only on a tool, such as a laptop or an iPad, but also on the surrounding environment. It means going outside and conducting experiments, collecting and analyzing data, and drawing conclusions.

SG: *Speaking of data: Considerable information about students is collected in the context of intelligent learning systems. How can we ensure that the data is actually used to benefit learners and not for other, commercial purposes (or worse)?*

EP: The topic of data is very sensitive. It's true, data is “new oil” in our society. And yes, data is sometimes misused. All of us, including schools, are far too careless – in entrusting our data to Google, Facebook and the like.

So how should the education sector address this issue? We need to raise awareness, not only among teachers, and we need new tools and platforms that allow the individuals who generate data - in this case students - to control their information. These young people should be able to choose who can see their data, in what form and to what extent. In the case of younger students, of course, settings should be available that enable parents to protect their children. However, it is also absolutely essential that the students themselves learn how to deal with data.

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But in addition, we can design technology in a way that allows us to maintain control of our information. For students, for example, there should always be a setting that permits them to choose which data to share, and with whom. We need to create high-quality solutions for protecting the privacy of student data. After all, no one wants corporations to preselect their future employees while young people are still in school.

I also believe that we, in Europe, have a particular responsibility to find solutions. Countries like Switzerland, with a social capitalism at its core, emphasize the importance of democracy and federalism, while the United States and especially California have what we might call surveillance capitalism. We need to work on democratic and decentralized models - and I think it is very important for Europe to play a leading role.

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Edy Portmann was one of the keynote speakers at the [2019 Zurich Campus Seminar](#). This inspirational event for teachers, entitled “A Digital Transformation in Schools,” examined ways to shape the future of education and presented exciting model projects as part of [Spotlight Switzerland](#).

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